Skeena-Kitimat Sustainable Fisheries Program

Mid-Term Report 1993-1995

Fisheries and Oceans | Pêches et Océans

Province of British Columbia

Canada

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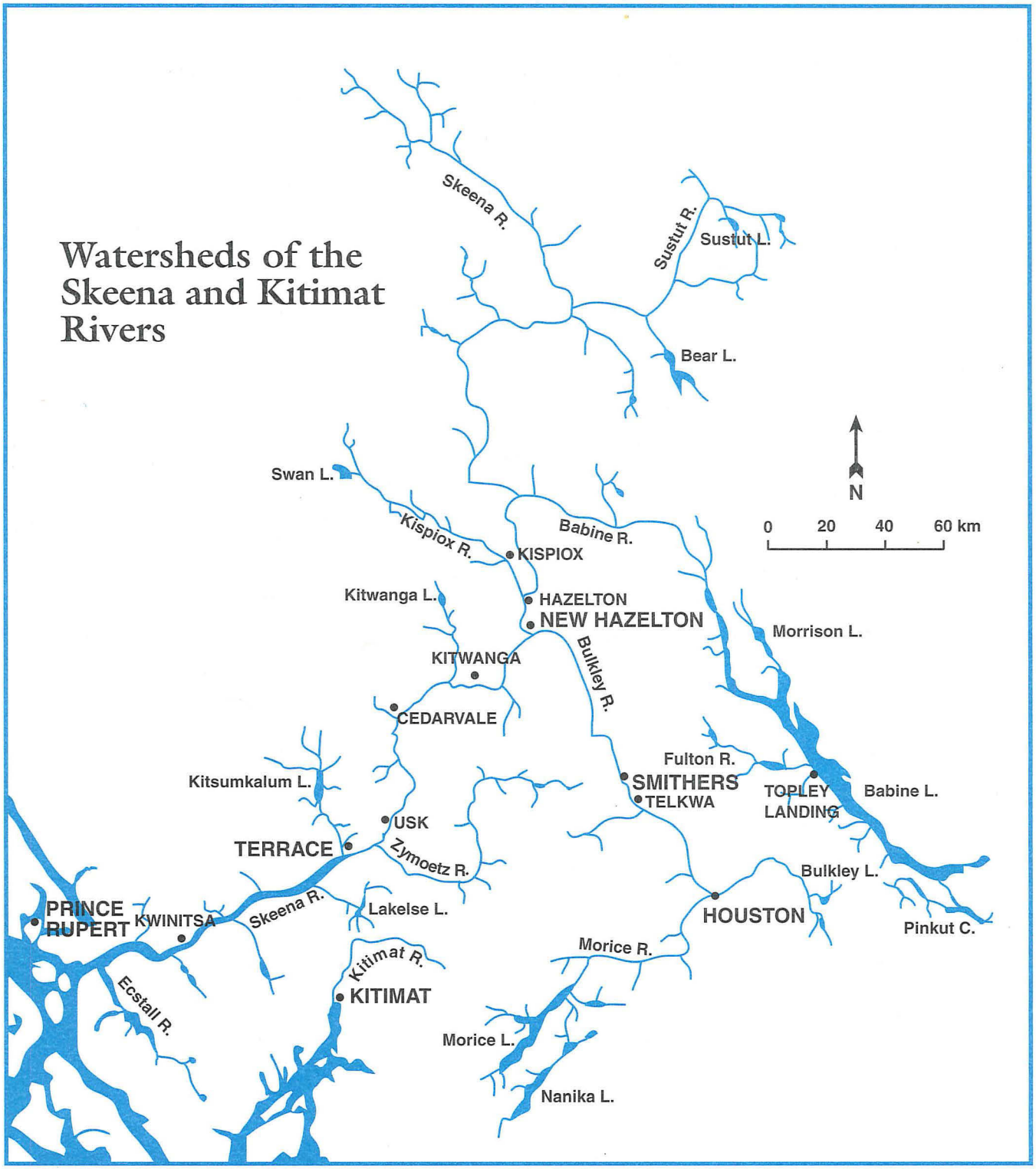
Watersheds of the Skeena and Kitimat Rivers
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Sustut R.
Sustut L.
Bear L.
N
0 20 40 60 km
Swan L.
Kispiox R.
Babine R.
KISPIOX
Kitwanga L.
HAZELTON
NEW HAZELTON
Morrison L.
KITWANGA
Bulkley R.
CEDARVALE
Fulton R.
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SMITHERS
TELKWA
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USK
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Morice R.
Kitimat R.
KITIMAT
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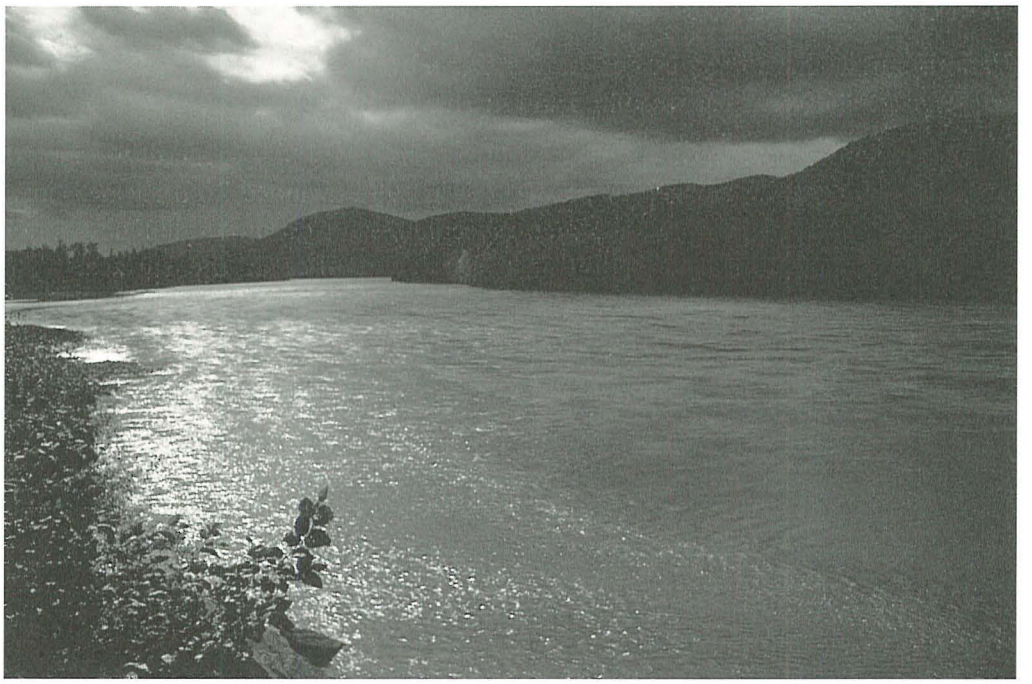
Morice L.
Nanika L.

The Skeena-Kitimat Sustainable Fisheries Program

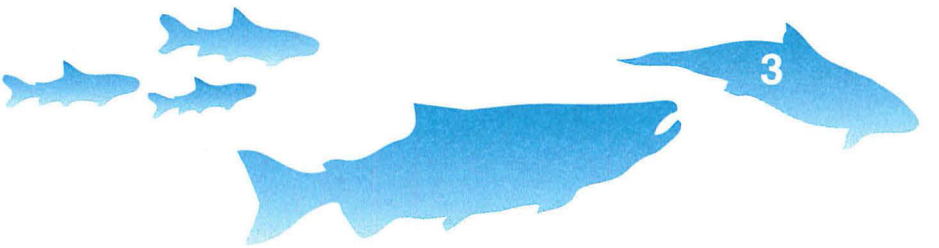
Mid-Term Report 1993-1995



A Sustainable Fisheries Program for the Skeena Watershed

Globally there is a steadily increasing awareness of the necessity for natural resource managers to maintain diversity in ecosystems to ensure the long-term sustainability of all fish species and stocks. This awareness is the motivation behind the move to more stock specific management and more selective harvesting methods in the Skeena and Kitimat systems.

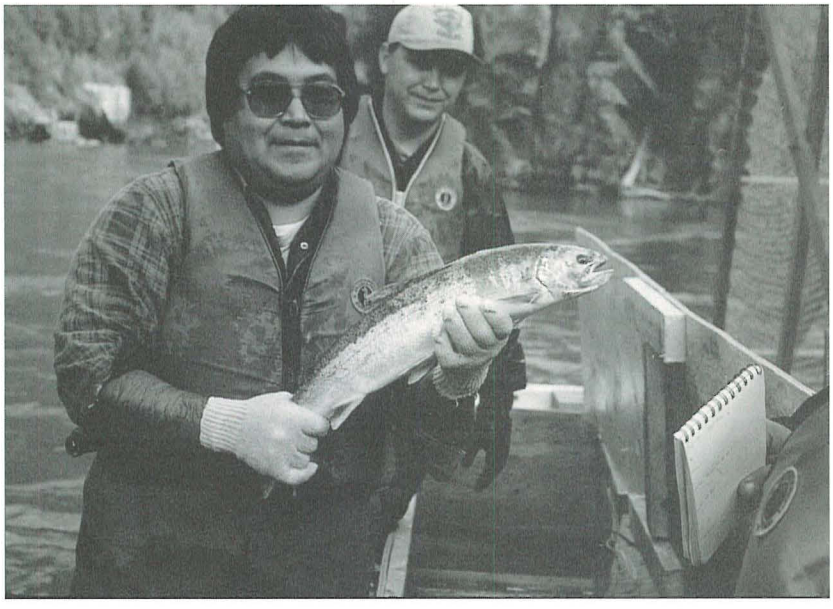
At the same time it is recognized the key habitats these fish stocks depend upon must be protected and rehabilitated where necessary to ensure that the fishery is sustainable. Co-operative action by all those who share in the responsibility for managing land and water resources is vital if key habitats are to remain productive.



A Plan of Action

In an effort to ensure healthy and productive fish species and stocks on the West Coast, the federal government initiated in August 1993 a four-year program called the Skeena-Kitimat Sustainable Fisheries Program. The intent of the program is to develop management strategies to protect weaker stocks while achieving sustainable fisheries, with the main focus on the Skeena River. Carried out by the Department of Fisheries and Oceans, the Province of B.C., and the Skeena Watershed Committee, a multi-stakeholder group, the program encompasses a broad range of activities to achieve its objectives:

- To develop a fully integrated short-term model fishery project to move the salmon fishery based in the Skeena River watershed towards a sustainable basis within four to five years.
- To ensure that planning for development in the Kitimat estuary meets the needs of fish and their habitats.
- Building on experience gained through the Fraser River Action Plan, to develop cooperative sustainable management programs in partnership with all orders of government and other stakeholders to foster environmentally sustainable development.

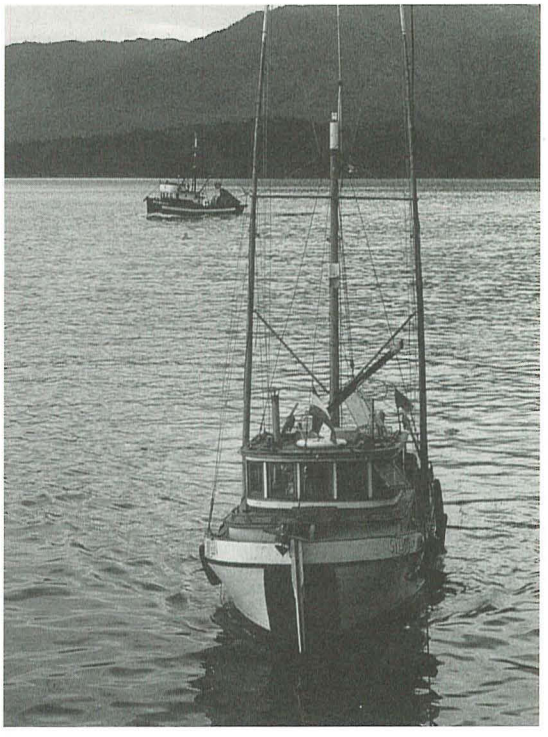


- To restore habitats and fish stocks and ensure future sustainability. To restore and enhance the environmental quality and natural productive capacity of fisheries stocks of concern and their habitats and to put in place the required management measures which will ensure long-term sustainability.
- To pilot-test and then implement fundamental changes in fisheries management practices after full consultation with affected stakeholders to ensure economic sustainability and the commitment of the public to the preservation of the resource and its habitats.
- To produce new stock assessment, habitat protection, and harvest plans and regulations based on the applied research and pilot projects which will be undertaken.
- To involve Aboriginal people in all aspects of resource management.

The Skeena-Kitimat Sustainable Fisheries Program is now at the half-way point of its four-year mandate. Much has been accomplished. Much is still left to do. This report provides a perspective on the first half of the program, and a look at what lies ahead.

Skeena-Kitimat Then and Now

The Skeena River flows 450 kilometres from northern B.C. into Chatham Sound just south of Prince Rupert. The Skeena is the largest producer of salmon on the North Coast, and is the second largest producer of salmon in British Columbia after the Fraser River.



The Kitimat River begins near the rugged slopes of Mount Davies, part of the Kitimat Ranges, and flows for 75 kilometres before reaching Kitimat Arm. The river provides the main freshwater flow into the estuary, which is located at the head of Kitimat Arm.

Canadian commercial fisheries targeting on Skeena bound sockeye, and pink salmon occur between the B.C.-Alaska border and the mouth of the Skeena. Aboriginal fisheries harvest all species from the approach waters of the Skeena to the upper reaches. Recreational fisheries occur in tidal waters adjacent to the Skeena for both Skeena bound and passing chinook and coho stocks, and in non-tidal portions of the Skeena for chinook, coho and steelhead. More recently, pilot scale non-tidal recreational fisheries on sockeye and pink have occurred in the Skeena.

Sockeye and pink production, and therefore catches, have been at high levels for most of the past ten years. The higher harvest rates resulting from these increased abundances have affected the ability of managers to protect less productive, non-target stocks, including non-Babine sockeye, early timing upper Skeena coho and summer run upper Skeena steelhead.

In the past there has been a shortage of reliable data available to substantiate steelhead stock status. The data that do exist suggest that Skeena steelhead returns have been highly variable over the past ten years. The reasons for variable steelhead abundance are not well understood, but are thought to include poor survival rates related to flooding and freezing, poor ocean survivals and over harvesting.

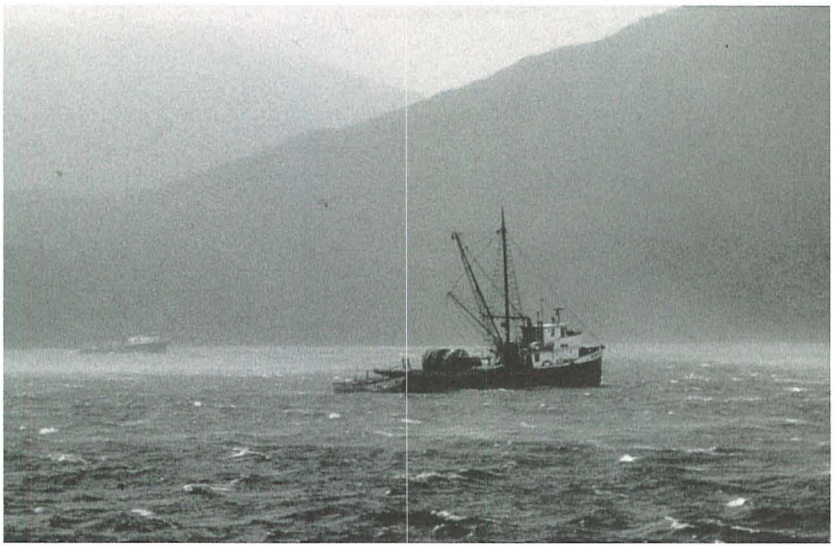
Skeena coho have been the subject of significant conservation management measures since 1990. Reasons for low levels of Skeena coho are thought to be similar to those for steelhead. Conservation measures have included curtailments to fisheries of all three sectors. In spite of these efforts, stock assessment information for upper Skeena early coho stocks suggests that additional conservation measures are required.

An exacerbating factor in dealing with both the coho and steelhead conservation concerns has been the inability of Pacific Salmon Treaty arrangements to limit the impacts of Alaskan fisheries on Skeena bound coho and steelhead stocks. Some estimates suggest that up to half of the commercial harvest of these stocks occurs in Alaskan commercial fisheries.

The Challenge

Fisheries that harvest Skeena River sockeye exploit mixtures of hundreds of distinct salmon populations. The much larger contribution from Babine sockeye obscures the individual contributions from these smaller stocks. Sockeye production from Babine Lake currently accounts for more than 90 per cent of the total Skeena system production, although 40 other lakes - accounting for 30 per cent of the lake area accessible to sockeye in the Skeena drainage - also produce sockeye.

Besides this mixed stock nature, there is also a mixed species component to the fishery. Other salmon species in the Skeena River, notably coho and steelhead, have reproductive rates that are lower than those of the Babine sockeye. As a result, coho and steelhead can not sustain the exploitation rates that would result in an efficient harvest of Babine sockeye, and is a source of great public concern.

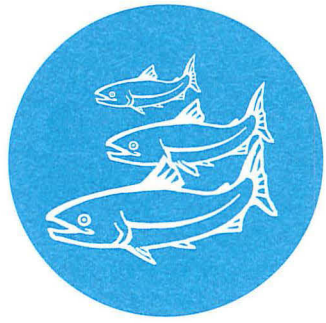


For the past several decades, management of the Skeena commercial fishery has concentrated on providing sufficient spawning escapement for specific stocks. This is called managing to an escapement target. It is generally suitable for single stock or slightly mixed stock fisheries where the escapement can be estimated in sufficient time to adjust the fishery. It is usually not feasible to manage fisheries to meet escapement objectives for many small stocks in a mixed stock circumstance such as the Skeena River mouth. Moreover, it is virtually impossible to manage to escapement objectives for coho and steelhead.

An alternative method is to manage harvest rates. Reduced harvest rates on weaker stocks and species (i.e. stocks and species with lower reproductive rates) will conserve those stocks, independent of stock size. Surpluses from more productive stocks would be available for harvest in discrete new fisheries or more selective existing fisheries.

The consequences of reducing the harvest rates in the existing fisheries are mixed. On one hand there will be more production from the less productive stocks. However, if there is no ability to make current fisheries more selective, total ocean catches will drop as protection is afforded the weaker stocks, and an increased surplus of strong stocks will be created upstream.

Progress Highlights - Harvest Management



Very little information is known about coho or steelhead and some of the wild sockeye populations. The Skeena-Kitimat Sustainable Fisheries Program is putting its efforts into finding out more.

Babine Counting Fence

The Babine River counting fence was established in 1946 and rebuilt in 1993. In 1994 funding was provided through the Sustainable Fisheries Program to improve the monitoring of salmon stocks for better and more stock-specific management practices.

The Babine counting fence is a major part of the effort to learn more about the mix of salmon populations in the Skeena River watershed. Among other things, the data collected here provide an accurate figure on salmon escapements, confirming the number of spawners getting to the spawning grounds.

All species of salmon spawn in the Babine River, but it is the sockeye that are so numerous. About 90 per cent of the Skeena River sockeye spawn in this river and other tributaries to Babine Lake. Adult salmon - sockeye, coho, chinook, pink, and some steelhead - are counted one by one as they swim into the counting chute from one of the seven holding traps along the 100-metre fence.

A smolt enumeration program upstream from the fence has been in operation for more than 30 years and is an essential part of assessing the production potential of Babine Lake. With the new fence, facilities are in place so that smolts can be counted as they pass through.

Sockeye are retrieved from traps for sampling, and scales are removed and sent to laboratories for stock identification. The sex, age and length of each fish is recorded before they are returned to the water.

Biological samples of coho and chinook are taken after they have spawned and died. Carcasses are easily recovered as they wash up against the fence. The heads of any fish with missing adipose fins are removed for analysis of code-wire tag information.

These data will be used to evaluate the harvest distribution and impacts of fisheries in Canada and Alaska.

Radio Tagging

A major radio tagging program for steelhead and coho was conducted in 1994 to provide estimates of stock specific abundance and migration timing that were not previously available. The idea behind the program is to find out more about steelhead and coho populations throughout the Skeena system, and how many fish enter each tributary to spawn.

Steelhead Radio Tagging

Estimation of steelhead run strength in the Skeena River is an important part of the overall management program. Over the years a number of techniques have been used to provide indices of run strength. These have included the Tyee test index, creel census programs, steelhead harvest analysis, counts at fences and weirs and catch per unit effort in the commercial fishery. However, the accuracy of these techniques is generally considered inadequate and there are serious limitations to working with only relative numbers. Therefore, the need to relate the historical index values to a known run or escapement is a high priority.

Coho and steelhead salmon were caught, implanted with a radio transmitter, externally tagged and released to continue their spawning migration.

The radio tag is a very small device inserted into the stomach of the fish. A metal numbered tag is attached to each side of the radio-tagged fish on the operculum or gill cover. One of these tags indicates the presence of the radio transmitter; the other is part of an additional external tagging aspect of the program.

There are 17 receiving stations located at various migration points along the Skeena River, at the conjunction of important tributaries to the Skeena (such as the Bulkley and Babine rivers), and further inland along the shores of these tributaries.

Receiving stations at various migration points in the Skeena River watershed allows each fish to be tracked throughout its journey upriver and into various tributaries. Each receiving station picks up the frequency and individual code of the fish and records its arrival time at that point in the river. The technology is sophisticated; it can record whether the fish turned into another smaller tributary or continued its upriver passage.

At the end of the tracking period the proportional distribution of radio tags is known and if there are a number of estimates of escapements for specific tributaries, statistical techniques can be used to provide an estimate of the overall escapement.

In the 1994 season, a total of 113 radio tags were applied to ocean caught steelhead during seine operations. Additional tags were attached to fish at the Kitselas fish wheel, the Tyee test fishery and by anglers to enhance information obtained from the stationary receivers.

Proportion of Radio-Tagged Steelhead Tracked to Each Tributary in the Skeena River in 1994

Tributary	Number of Tags	Percentage of Tags
Upper Skeena	6	8
Sustut	5	6
Babine	12	15
Kispiox	11	14
Middle Skeena	2	3
Bulkley	21	27
Morice	5	6
Copper	4	5
Kitsumkalum	2	3
Lower Skeena	10	13

Coho Radio Tagging

In 1994, a total of 288 coho were radio-tagged. Fifteen of these were caught and tagged in the river (about 100 km from the mouth of the Skeena) by means of a fishwheel. The majority, 273, were tagged in the Skeena River estuary using ocean seine vessels. In addition, 1023 coho were tagged solely with an operculum tag - a radio-tagged fish carried two operculum tags.

The coho program success was hampered by the low proportion of tagged fish that entered the Skeena River from the tagging areas adjacent to the mouth of the Skeena. Known escapements - with tagged/untagged ratios - from the Babine Toboggan and other tributaries were provided as part of the program.

Further analysis and documentation of the tagging programs will be provided over the next year.

Skeena Test Fishery Evaluations

The sockeye catchability of the Skeena test fishery has shown a progressive bias over the past 20 years. This bias was thought to be linked to the saturation of the test net as a result of the significantly increased overall abundances of sockeye and pink salmon.

This explanation of the cause of bias was tested in 1994 when the sockeye and pink abundance in the Skeena was the lowest in recent history. Despite this low salmon abundance, the bias in the test fishery catchability was the highest ever, suggesting there is another cause. A hydroacoustic program carried out in 1994 evaluated the distribution of migrating salmon relative to the test net but there was no indication of

a bias or variability in the movement pattern of the salmon that would likely cause the progressive bias in the catchability of the test net.

The program is continuing with further assessments of net material to evaluate whether varying water clarity is the cause of change in catch rates.

Weedline/90 Mesh Test

Various studies have been carried out to test selective harvesting techniques that conserve steelhead such as weedlines and mesh nets.

While previous studies have indicated the benefits of using 1.2 metre weedlines, further testing in 1994 included 90 mesh nets with 1.2 metre weedlines and 60 mesh gillnets with an additional 10 fine meshes at the surface. This program involved 14 gillnet vessels fishing during normal gillnet times in Area 4. Catch rates for each species were compared with the regular commercial fleet through an observer program.

The overall results indicate savings of 10-15 per cent in the proportion of steelhead harvested. Testing continued in 1995.

Skeena Sockeye and Pink Run Reconstruction

An analysis of the historic Skeena sockeye catch and escapement information is required to provide the best stock recruitment-based estimate of current and potential overall Skeena sockeye and pink reconstruction. Over the last several years, fisheries biologists have been reconstructing annual catch for each Canadian and U.S. fishing area based on the known catches and the best estimates of the proportion of Skeena origin sockeye. This program will be integrated with the Nass sockeye reconstruction, and it is hoped that the reconstruction will be jointly agreed upon as the best estimate with the U.S. through the Pacific Salmon Treaty Northern Boundary Technical Committee.

Observer Program

Some of the largest and most concentrated fleets in British Columbia fish off the north coast of the province. Although all species of salmon are caught in these net fisheries, including steelhead, information is scarce on how many of each are harvested and from what population they come.

Estimation of the steelhead catch by the commercial fleet is a critical part of monitoring under the Skeena-Kitimat Sustainable Fisheries Program, given the need to reduce the harvest rate of steelhead and increase escapements.

While radio tagging and escapement monitoring projects will provide estimates of escapement, the catch of steelhead in the commercial fishery still needs to be determined if a complete picture of run strength is to be obtained.

While the in-season hail process and subsequent fish sales slips generally provide a good estimate of catch for target species, the same is not true for the catch of incidental species such as steelhead. In 1994, the provincial government provided funding for trained technicians to observe and record catches aboard fishing vessels.

To get an accurate count of these fish, 30 observers on board seine and gillnet vessels observed and reported the catch of each net set. Observers recorded not just how many of each species were caught, but when and where and for how long each net was set. The program focused on catches off the north coast, in areas west of Portland Canal, including Chatham Sound and in the mouth of the Skeena River.

Observers counted sockeye, coho and steelhead caught during all fishing operations, without impeding the operations of the vessel. Biological samples - recording size and sex, and taking scale samples of coho, steelhead and chinook - were also undertaken by the observers.

Observers recorded the size and tag number, took scale samples and noted the condition of each before they were released. When these tags are recovered in any of the commercial, Aboriginal or sport fisheries, they provide an idea of migration patterns and the behaviour of the steelhead from the tagging location to the point of capture.

Tissue samples were taken from dead steelhead and sent to the provincial government labs for DNA stock identification research. A missing adipose fin indicated the possible presence of a coded-wire tag. On these fish, the head was removed, tagged and returned to labs for examination of the tag.

Preliminary calculations suggest that 8,494 steelhead were caught in the Area 4 fishery in 1994, and at least 1,800 steelhead caught in the Area 3 seine fishery, for a total steelhead catch in excess of 10,000.

Final analysis of the numbers collected, taken with information provided to other aspects of the Skeena-Kitimat Sustainable Fisheries Program, will give stakeholders and fisheries managers a substantial pool of real data. These data will provide valuable information about the numbers and timing of fish in specific catch areas.

Summary of Observer Records for the 1994 Gill Net and Seine Fishery

Gear	Sets	Net Hrs	Sock	Coho	Pink	Chum	Chin	Sthd ct	Sthd rel
Stand Gnet	1335	3381	13143	1048	5169	3788	147	174	63
Exp Gnet	522	1268	5579	677	2066	2106	39	58	25
Seine	465	422	13461	1786	25571	7750	457	49	35
Total	**2322**	**5071**	**32183**	**3511**	**32806**	**13644**	**643**	**281**	**123**

Steelhead Recovery

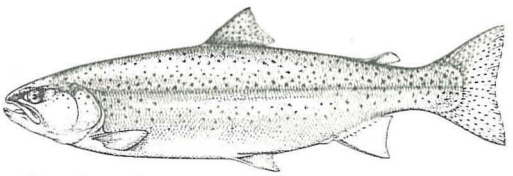
This program was developed in cooperation with the commercial fishing industry to reduce steelhead mortality in the Area 4 commercial gillnet fishing fleet. Steelhead captured by gillnet vessels were held on board in holding tanks until a collector boat retrieved the fish and transported them to a large barge holding facility. The steelhead were held in large holding tanks on the barge and released after the end of the commercial fishing opening each week. Steelhead were tagged prior to release and any recoveries or recaptures in upper Skeena River areas were documented.

In 1993, approximately 310 steelhead were collected from commercial boats, held on the barge until the end of each week's commercial opening, then released allowing for continued migration into upriver spawning areas in the Skeena river system. It is estimated that approximately 95 per cent of the steelhead collected and delivered to the barge survived release.

This program raised the profile of steelhead by-catch within the commercial net fishery in the Skeena river area, and provided valuable information suggesting that some steelhead caught in nets could be released safely to continue migration to upriver spawning areas. The increased use of holding tanks, combined with timely and careful release of fish, resulted in the barge program being phased out. Further improvement of holding and release techniques by fishers has the potential to yield increased benefits.

Genetic Identification

Steelhead Genetic Stock ID


Steelhead

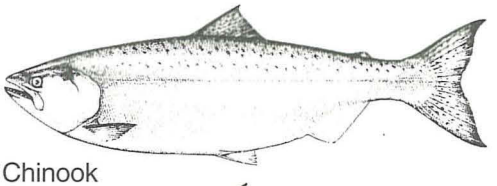
Knowing the stock composition of a fishery is an important component of fisheries management. In the Skeena River, there are several stocks of salmon and steelhead, each with its own physical characteristics, run timing, ages and allowable harvest rates.

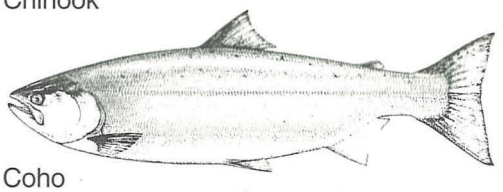
Since each steelhead stock migrates at its own characteristic time, it is important to be able to identify when, for example, the Babine or Sustut steelhead are moving through the area of a commercial fishery. It is also useful to be able to examine the total catch of steelhead, and determine the proportion of each stock represented. This information can then be used in post-season run reconstruction.

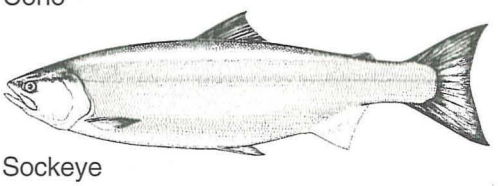
In 1994 a number of genetic studies were carried out. The objective of the project was to evaluate the effectiveness of the various genetic techniques available as a means of identifying Skeena steelhead stocks in the commercial fishery.

Blood samples were taken from salmon species from each of five Skeena River tributaries - the Babine, Copper, Kispiox, Morice and Sustut rivers - and analyzed using three genetic techniques: allozyme electrophoresis; mitochondrial DNA; and nuclear DNA. Scientists determined that nuclear DNA testing was the most cost-effective and efficient.

Genetic Stock Identification for Skeena Sockeye, Chinook and Coho


Chinook


Coho


Sockeye

Genetic stock identification techniques are also being developed and tested for sockeye, chinook and coho salmon populations within the Skeena watershed. This research involves two phases: the first is to survey biochemical and molecular genetic variation in Skeena salmon populations to understand population structure and to find cost-effective procedures for estimating the stock composition of in-river catches and escapements.

Survey work is largely completed for sockeye, partly completed for chinook, but just beginning for coho. The second phase is to demonstrate the feasibility of new stock identification techniques with a view to initiating marine catch sampling programs that would improve management of Skeena/Nass stocks. This work is underway for Skeena/Nass sockeye but has not yet begun for the other species.

By the end of the program in 1997, survey work should be largely complete for all three species, and feasibility studies should be finished for sockeye salmon. This research will have important implications for the ability to manage and assess the status of individual Skeena salmon stocks. In particular, it will influence the scope and objectives of sampling programs in commercial and test fisheries to determine catch composition, run size, run timing and spawning escapements for individual stocks.

Imprinting for Selective Harvest

Chemical imprinting techniques are being investigated to develop procedures for selectively harvesting enhanced (Fulton-Pinkut) sockeye in the Skeena River. Genetic surveys have verified that sockeye are able to home precisely to their natal tributary streams. This implies that sockeye can recognize their natal tributary despite having left it immediately after emergence, and that imprinting must occur sometime between fertilization and downstream migration of fry.

Scientists believe if the mechanism of imprinting can be identified, it can probably be manipulated. For example, a non-toxic chemical scent might be added to the Babine spawning channels at the time of imprinting, so that four to five years later, enhanced Babine sockeye could be attracted into fish traps by releasing the same chemical scent. This kind of selective harvesting technique would permit full utilization of enhanced sockeye runs without overexploiting co-migrating stocks of steelhead, coho salmon and wild sockeye salmon.

The feasibility of attracting maturing sockeye with specific chemicals is being tested by exposing juvenile sockeye to several different classes of chemical in experiments where the period of exposure is manipulated to include various stages of development from fertilization to smolting. Fish were tested both at age one in 1995 to give any early indication of success, and will be tested at maturity at age two in 1996. It is anticipated the potential feasibility of the method could be established before the end of 1996.

Upper Sustut River Salmon Stock Assessment

This stock assessment program supports the conservation of anadromous fishery resources by providing reliable, direct measurements of wild salmon stock abundance in the upper Skeena River. The program monitors trends in representative low-productivity, unenhanced salmon stocks to ensure sustainable stock exploitation under the current harvest management protocol on the North Coast. In addition, the program provides support to the Pacific Stock Assessment Review Committee process, and to DFO's Aboriginal Fisheries Strategy by providing in-season catch monitoring of salmon by the Takla Indian Band and Carrier-Sekani Tribal Council.

The spawning escapements to two sockeye, two steelhead, one chinook, and one coho salmon populations are being measured

directly by fence count. These wild populations are considered representative of approximately 20 other populations which have not been counted in the Skeena River upstream of the Babine River confluence.

Biological data such as age, sex ratio, fecundity, length, weight and run timing are also collected annually. These accurate escapement data provide a quantitative basis for other projects investigating juvenile salmon production and habitat characteristics in the Sustut River.

Upper Sustut River Juvenile Salmon Production

Juvenile salmon production is being measured through this program in the Skeena River upstream of the Babine River confluence. The abundance, size and migratory behaviour of juvenile salmonids are being investigated to determine the productivity of representative high-altitude, unenhanced populations. These measurements represent the "output" from a spawning escapement "input" measured as part of the Upper Sustut adult enumeration program described above.

Other linked programs focus on the rearing environment, and the behaviour, growth and survival of juveniles before they leave the Upper Sustut habitat. Knowledge of juvenile productivity will help to determine what exploitation rates can be sustained by stocks like those in the Upper Sustut that are considered among the most sensitive to over-exploitation.

Babine Smolt Enumeration

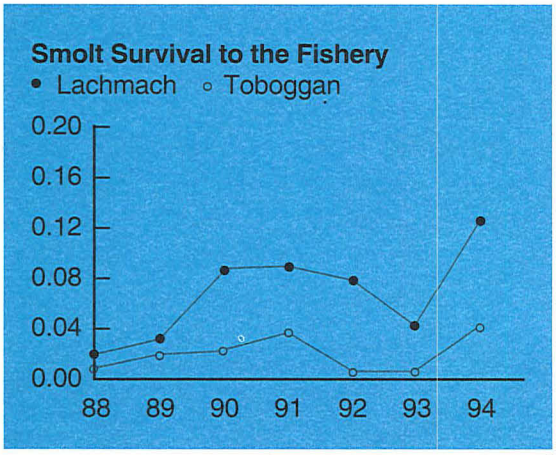
This project is intended to review and improve procedures for enumerating Babine Lake sockeye salmon smolt production. Smolt production from Babine Lake has been enumerated since 1951. These data have been valuable in investigating trends and density-dependent factors affecting marine and freshwater production of Babine sockeye. The only comparable data have been collected at Chilko Lake in the Fraser River where a photographic enumeration system has been used for many years.

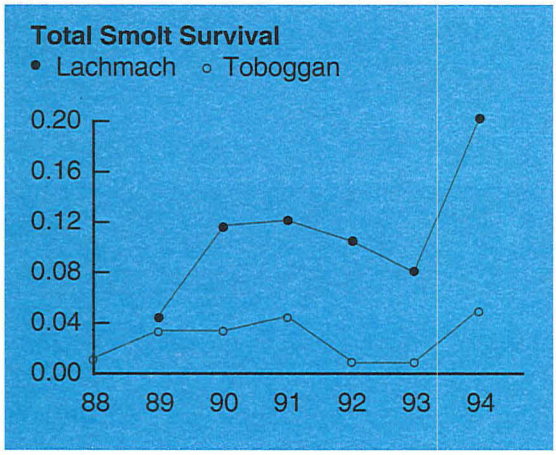
Initially, scientists hoped that a video system at Babine Lake would provide more precise counts and be less costly to operate than the historical mark-recapture method. Video equipment was installed at the Babine adult counting fence as a pilot project in 1993. Problems were identified and engineers built new dewatering structures for a larger scale trial in 1994. Although the video system functioned well, the structures designed to guide and concentrate smolts for video enumeration were inadequate for the water flow conditions experienced. This problem may be difficult

to overcome and requires an alternative approach, probably using rotary screw traps. Given the problems implementing a video enumeration program, additional developmental costs are difficult to justify if the reliability of estimates of smolt production from the less expensive mark-recapture program is acceptable. Accordingly, further development of the video technique is on hold pending the completion of studies to assess the reliability of the historical mark-recapture program in 1995.

Adult Coho Enumeration

One of the activities funded by Skeena-Kitimat Sustainable Fisheries Program is counting coho spawners in four streams in, or adjacent to, the Bulkley River. Conservation concerns for Bulkley River coho are one of the most pressing problems in the Skeena.

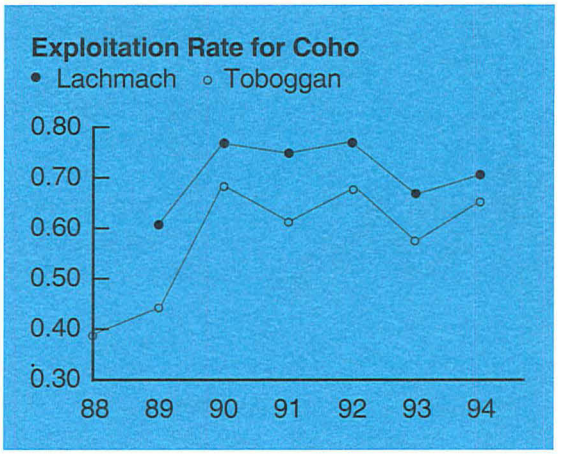




In three of the systems - the Telkwa River, the McDonell lakes system and Gosnell Creek - coho were enumerated during three helicopter over-flights spaced through the main spawning period. The flights included touchdowns and swim counts in areas where coho were observed to obtain some measure of observer efficiency. In addition, the Province of B.C. funded the operation of a counting fence on the Bulkley at Houston.

The results confirmed the seriousness of the situation in the upper Bulkley/Morice. Coho were nearly absent from the Gosnell, and spawner densities above Houston signify conservation concerns. Spawner densities in the Toboggan were high, which fisheries scientists attribute to the probability of the productivity boost given the system by the hatchery operating there. Escapement to the McDonell lakes were reasonably high, especially since the surveys were started after peak spawning. The major surprise of the survey was the high densities observed in the Telkwa. Counts in the river in 1982, 1984, 1988 and 1993 ranged between 36 and 122, numbers obviously considerably lower than were observed in 1994.

At the Toboggan Creek adult fence, biologists helped hatchery staff operating the fence improve their marking and counting techniques to enable them to accurately estimate the escapement in the event of a fence wash-out. Fortunately, the fence remained functional throughout the coho run. The revised marking regime enabled scientists to determine that no coho entered the system prior to the installation of the fence. (In previous years, the presence of many unmarked fish upstream of the fence led some scientists to wonder if some spawners entered the system before the fence was installed).

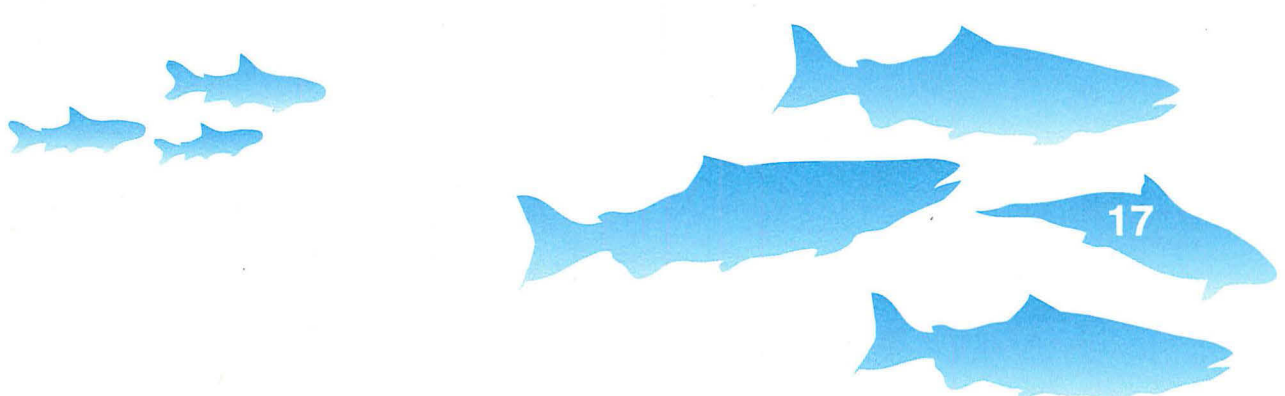


Data available from coded-wire tag recoveries for Skeena coho indicate that not only have smolt survivals been highly variable but also that the temporal patterns of smolt survival are very similar for populations throughout the region. Smolt survivals for upper Skeena coho - in Toboggan Creek, for example - have been consistently lower than for coastal populations. Since no non-hatchery coho can sustain exploitation rates over 60 per cent if smolt survivals are consistently below five per cent, scientists consider this difference in smolt survivals a major factor in the current conservation concerns for interior coho. Since there is likely no practical way to increase smolt survival, scientists have determined the only option for maintaining early run or interior coho is to reduce total exploitation rates to a level that can be withstood by the interior populations.

Results of this work conclude that early-run Skeena coho are in serious difficulty. Aggregate abundance indicators are declining following a trend that began more than 20 years ago. Many of the component populations are well over the "knife-edge" and in some areas, like the upper Bulkley, scientists believe that failure to take appropriate conservation measures may result in extinction of some populations. All of the indicators - aggregate abundance indices, juvenile densities, size distributions and numbers of streams with no coho present - are signalling the seriousness of the situation. Coastal populations, like the Lachmach, appear to be stable but the time series of available data is very short. The underlying cause of the problems is probably multi-factor. Local factors like habitat loss are probably not as important as regional factors like variable and low smolt survivals.

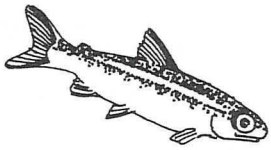
Scientists involved in the project believe the temporal association between the start of the decline and the intensification of the river-mouth sockeye fisheries is probably not coincidental. The low and highly variable smolt survivals - coupled with consistently high exploitation rates - pose a serious concern for risk to all Skeena coho and especially to the early-run populations.

Information on juvenile coho will continue to be collected throughout the drainage to improve the ability to estimate harvest and survival rates for Skeena coho resources.

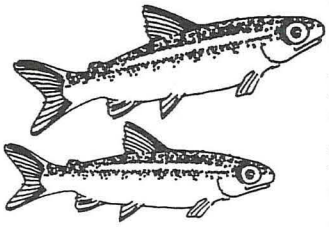


Habitat Productive Capacity

Rearing Capacity of Skeena River Sockeye Nursery Lakes



The objectives of this study are twofold: to determine the current status of juvenile sockeye stocks in selected lakes of the Skeena River system; and to determine the productivity of these lakes and the maximum number of sockeye they are capable of producing.



This study began in the fall of 1993, when surveys were carried out on Babine and Morice lakes. Total numbers of fry in Babine Lake in October 1993 were estimated to be 58 million (average density was 1,221 fry per hectare, with an average weight of 4.3 grams). In Morice Lake, despite fry densities of only 73-ha and a total population of seven million, average October weights were only .8 grams. These data confirm what previous lakes have suggested - that Babine Lake is a far more productive sockeye nursery lake than Morice Lake. Further, Morice Lake is so oligotrophic, or lacking in nutrients, that rehabilitation of its sockeye stocks will require an enhancement technique such as lake fertilization in addition to increases in escapement and fry recruitment.

In 1994 studies were carried out on five lakes - Babine, Johanson, Kitsumkalum, Lakelse and Sustut. To determine lake rearing capacity and productivity, monthly surveys from May to October were conducted. Juvenile sockeye numbers, size, diet and distribution were determined in fall hydroacoustic and trawl surveys. Resulting data indicate that all lakes in this study are oligotrophic. Babine is the most productive lake in the study, and is about five times more productive than Kitsumkalum Lake, which is the least productive of the five lakes. Johanson, Lakelse and Sustut lakes are 50 per cent, 42 per cent and 33 per cent less productive than Babine. Preliminary predictions are that optimum sockeye escapements to Johanson, Kitsumkalum, Lakelse and Sustut lakes are 4,300, 41,000, 43,000 and 8,900 spawners. Available escapement data to these lakes indicate that current escapements are below optimal. In October 1994 there were 420,000 fry with an average weight of 6.1 grams in Lakelse Lake, 21 million fry with an average weight of 3.64 grams in Babine Lake and 237,000 fry averaging 1.61 grams in Kitsumkalum Lake. In a late August survey of Johanson and Sustut lakes a total of 57,800 and 430,000 sockeye fry were found.

In 1995 a second year of data collection on Babine Lake was carried out, as well as limnological and hydroacoustic surveys of Kitwanga and Morrison Lakes, and hydroacoustic surveys of several additional lakes such as Alastair, Bear and Swan. Preliminary analyses are expected to be completed at the end of 1995, with a final analysis of collected data in 1996.

Habitat Protection, Restoration and Enhancement

Habitat in the Skeena system is relatively pristine, with current estimates suggesting that less than 10 per cent of the productive capacity of the Skeena is compromised by habitat degradation. The adjacent Kitimat River valley has been heavily logged during the past 25 years, and is comparatively heavily industrialized at the estuary. Habitat problems are thought to be limiting both production and use of many species.

GIS Mapping

The Skeena-Kitimat Sustainable Fisheries Program is making extensive use of an advanced computer mapping technology called Geographic Information Systems, or GIS. This powerful software tool makes complex information more accessible by creating dynamic links between maps and databases (i.e. geography and information). For example, a biologist using GIS might view a watershed map on a computer screen, and by clicking with a mouse on a particular stream gain access to detailed databases on fish habitat, fish distribution, land use and vegetation relevant to that location. Users can quickly see relationships between these elements, helping them make informed decisions on habitat restoration and fish management.

To date, about 100 maps covering the Skeena watershed have been produced in digital form. This information will be combined with watershed maps with the new Fish Information Summary System, as well as the Stream Information Summary System.

Habitat Based Escapement Goals

One of the goals of the coho assessment work underway in the Skeena watershed is to estimate the potential coho production by assessing coho productivity in different productions areas and habitat types. From this data an estimate of the total amount of coho habitat available can be produced.

From past work on juvenile coho, fisheries scientists have determined that most coho production is centred in low gradient stream habitat, lakes and off-channel pond areas. Larger aggregations of these habitat types are readily available on relatively large scale topographical maps and air photos.

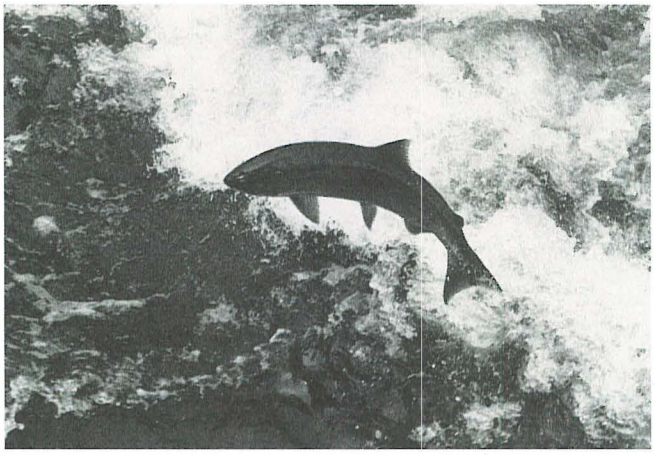
The initial work involved using existing information on coho utilization as well as map and air photo interpretation to describe major production areas in the Skeena River watershed. From these measured production areas the amount of coho habitat present in several habitat classes was estimated. The initial work will be translated to a map showing the major coho production area, together with a description of the production areas and an outline of the type of information available for each area.

This description includes escapement information, physical habitat descriptions and juvenile sampling information. The second phase of the project to be completed in 1995/96 will consist of "groundtruthing," or walking several of the production areas to confirm the validity and usefulness of this techniques.

Skeena River Water Quality Study

This study was designed to provide an overview of the water quality in the Skeena River drainage. Other elements of the project include:

- an assessment of municipal and industrial waste into the Skeena and its tributaries;
- identification of parameters which are critical in the assessment of cumulative impacts from proposed developments;
- identification of additional water quality information in critical areas; and
- an assessment of in-stream flow needs and impacts from water withdrawals in the watershed.



At the mid-point of the program, the data on the existing conditions in the river have been collected and summarized. From these data, the effluent loading in the river can be estimated to determine whether federal and provincial guidelines are being met. Over the next year, the study will analyze the data to assess the significance of the waste loadings, water withdrawals and other unregulated discharges into the Skeena River watershed.

Once this assessment is complete, the report will outline a series of recommendations which will allow resource agencies responsible for managing water quality to direct their efforts toward the most critical geographical areas and activities within the watershed. Data gaps in management regimes will also be identified in the final report, which will serve as a useful tool for these agencies.

Habitat Restoration Reconnaissance

Finding suitable candidates for habitat restoration is the purpose of habitat reconnaissance work being carried out in the Skeena watershed. In 1994 and 1995, investigations took place on the Morice, Telkwa, Bulkley, Zymoetz, Lizard and Georgetown systems. Some of the findings of this work are:

- Owen Creek and some areas on the Morice show promise for off- channel rearing development. A former channel through Owen flats near the confluence of the Morice river was surveyed and four standpipes were installed to monitor groundwater levels through the winter and summer low flow periods. Completion of monitoring and final surveys are recommended with the potential for construction to follow in 1996/97.

- Aerial flights over the Telkwa River combined with foot inspections resulted in three areas being recommended for further assessment and survey work.
- A former side channel to the Bulkley River opposite Smithers was investigated for its potential for off-channel rearing. Biologists believe there is potential for deepening the channels and improving its connection to the Bulkley.
- An obstruction on the Lizard Creek which supports coho and pink populations was inspected and extensive stable spawning and rearing habitat found. Improvement of this passage is recommended.
- The Georgetown system was investigated for its potential for sockeye or coho fry planting, as well as the feasibility of providing a passageway above some falls. Although passage at the falls was considered too difficult to undertake because of the amount of loose shale in the area, biologists have recommended further assessment of the lake's potential for rearing fry.
- The Skeena Watershed Committee - a multi-stakeholder body - has struck a working group to assist the provincial government's Forest Renewal Program on watershed restoration projects.

Kitimat Estuary Committee

Balancing the needs of the environment with social, cultural and economic values is the goal of the Kitimat Estuary Committee, formed in 1993 to prepare a land use plan within the estuary for a range of single and multiple purpose designations. With representation from DFO, provincial and local government, the Haisla and industry, the committee has embarked on an ambitious course designed to provide an overall vision for the area well into the 21st century.

The plan is intended to help ensure ecological diversity and environmental quality necessary for sustainable fisheries. To that end, the Committee is looking at identifying a wide range of areas -those that need environmental protection and enhancement, as well as areas suitable for recreational purposes and those that have cultural significance, particularly for the Haisla.

All Pacific salmon species use the estuary for assimilation both as young fish entering the ocean and as mature fish returning to spawn, while eulachon use the estuary as part of their spring migration for spawning.

The lower river and estuary is rich in other wildlife resources. A broad range of species use it either as a permanent home, a transition from marine to freshwater environment or as a seasonal refuge. The estuary is especially important for birds, particularly in the winter when severe conditions may force them from the Interior to the coast for survival.

In the last several decades the community of Kitimat has experienced an industrial boom, with logging, pulp and paper operations and chemical factories proliferating near or on the estuary.

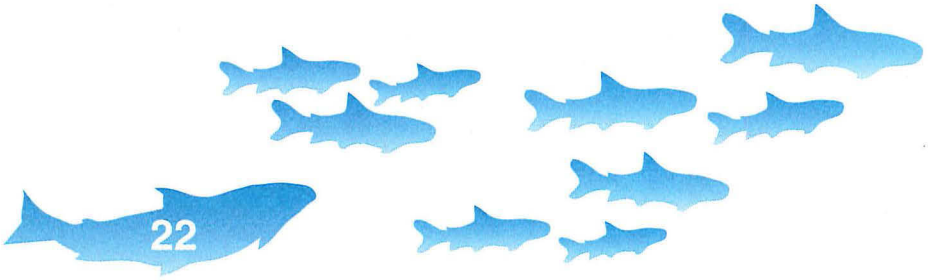
With this increasing industrialization, the area has achieved strategic economic significance. Along with Prince Rupert, Kitimat is the only link between the northern portion of B.C. and western Canada and world off-shore markets, particularly those in Pacific Rim countries.

The committee was formed following proposals to build a port to support additional industrial activities. DFO and the provincial government recommended further review be undertaken to determine the long-term implications for the estuary.

The committee met regularly during 1993/94 and developed terms of reference for developing a land-use plan for the Kitimat River Estuary. Funds from the Skeena-Kitimat Sustainable Fisheries Program, with matching contributions from the provincial government, the District of Kitimat and local industries, will be used to collate and synthesise known information on resources in the estuary, map fish and wildlife habitat and develop land use strategies for the future.

The Haisla have not yet endorsed the terms of reference and the committee has discussed its options for continuing and at the same time endeavouring to reach full consensus of all the parties at the table. It is anticipated that over the next two years, the plan will be drafted and implemented.

Once a set of proposed options for land use in the estuary has been prepared, a series of open houses and public meetings will be held to provide information and seek input from the community and all interest groups.



Building Partnerships

An important element of the Skeena-Kitimat Sustainable Fisheries Program is developing partnerships. This has been achieved through a close working relationship with stakeholders in the Skeena watershed.

Providing a Socio-Economic Profile

The Skeena watershed is a productive nursery area yielding millions of adult salmon which support commercial, recreational and Aboriginal fisheries. These fisheries are important not only for their commercial value, but also for their cultural and environmental value.

The fish resources, however, are finite and some are scarce, and there is significant conflict among the various users. The lack of baseline information on the importance of the fisheries to the regional economy has impeded the rational and balanced assessment of management alternatives.

The objectives of a study undertaken in 1994 were to develop a baseline socio-economic profile of the Skeena watershed, and to identify the importance of the fisheries to the economy, social/community structure and biological diversity of the region.

In 1993, the fish resources of the Skeena watershed, including salmon and non-salmon stocks are estimated to have supported 2,535 person-years of employment within the region. More than two-thirds of this employment results from the fish processing sector. The sport fishery supports about 10 to 20 per cent of the total fisheries-related employment.

Including employment generated outside the watershed, the Skeena fishery is estimated to support a total of 3,600 person-years of employment within the province. Salmon alone supports 1,365 person-years of employment.

The Skeena fisheries are estimated to have resulted in a total of $76.4 million in wages and salaries within the watershed in 1993. Salmon alone creates 28 per cent of this income.

Total provincial wages and salaries from the fishery in the watershed is estimated at $108 million, including employment income within the region.

Partnerships with First Nations

The Skeena-Kitimat Sustainable Fisheries Program has forged strong partnerships with Aboriginal fishing groups in the watershed in an effort to restore and enhance the productivity of the Skeena River. They contribute their special knowledge and expertise of the river and especially of its fish resources. The river has played a vital role to First Nations people for thousands of years and will continue to do so in the future.

Through the Aboriginal Fisheries Strategy, a federal initiative, the Skeena-Kitimat Sustainable Fisheries Program provides funds to Native bands throughout the watershed to carry out projects.

These include funding arrangements through the Aboriginal Fisheries Strategy; involvement of First Nations groups in the stakeholder processes such as the Skeena Watershed Committee and the Kitimat Estuary Committee; and through direct partnerships in funding specific projects carried out by First Nations in support of the goals and objectives of the Sustainable Fisheries Program.

Ned'ut'en First Nation

Since the inception of the Aboriginal Fisheries Strategy, the Ned'ut'en people, whose traditional territory includes Babine Lake, have been involved in a variety of projects that contribute to the overall objectives of the Skeena-Kitimat Sustainable Fisheries Program.

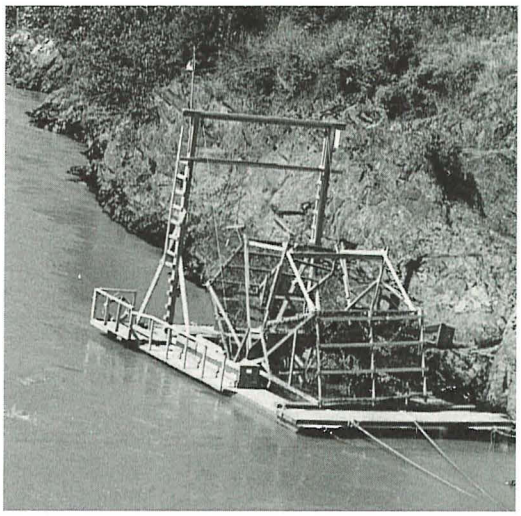
The principal efforts of the Ned'ut'en fisheries staff have been in carrying out stream work in the natural spawning stream tributary to Babine Lake. This work has included all spawning ground enumerations and reporting, as well as ensuring that the streams are accessible to spawning salmon.

Fisheries management work carried out by the Ned'ut'en has included monitoring of their communal fisheries. These communal fisheries include harvest for sale of sockeye salmon that have been declared surplus to spawning requirements, as well as the traditional harvest to address the social, ceremonial and food needs of the Ned'ut'en people. This work is funded by the Sustainable Fisheries Program through the Aboriginal Fisheries Strategy, which has also funded the development of selective harvesting techniques at the Babine Fence and in Babine Lake. These selective harvesting techniques, which include dip nets and beach seines, allow the harvesters to focus on target species and to release non-target species.

In addition, the Ned'ut'en fisheries program has been working on assessing the habitat quality of the salmon spawning streams in the Babine drainage. Of particular interest to this community are the effects of logging on spawning streams, and the impacts of mine leachates on fish populations of Babine Lake. Some of this work is being carried out under contract to the Skeena-Kitimat Sustainable Fisheries Program.

Gitksan Wet'suwet'en Watershed Authority

The Gitksan Wet'suwet'en Watershed Authority (GWWA) represents the First Nations of the Gitksan, Wet'suwet'en and Gitanyow. The involvement of these groups in the Sustainable Fisheries Program has been funded almost exclusively through the Aboriginal Fisheries Strategy. Work carried out in this portion of the Skeena River and its tributaries has focused on habitat assessment in the spawning streams as well as on fisheries management issues. The fisheries management issues include monitoring and enforcement of both the inland commercial fishery and the communal fishery for food, social and ceremonial purposes.



The development of the selective inland commercial fishery has been of interest both from the perspective of the economic development opportunities it affords, and from the perspective of experimentation with innovative selective harvesting techniques, including weirs, fish wheels, dip nets and beach seines. The efforts of the GWWA to develop selective harvesting techniques have resulted in a virtual elimination of less desirable gillnet technology from the lower Babine River food, social and ceremonial fishery. This shift is strongly supported and encouraged because of the non-selective way that gillnets impact all stocks and species, including those for which there are recognised conservation concerns.

In addition to selective harvesting, the GWWA selective fishing techniques have played an active role in ongoing experimental tagging programs designed to illuminate issues related to salmon timing and migration routes. These have include Peterson disc mark recapture experiments and participation in the radio tagging programs described elsewhere in this report.

Tsimshian Tribal Council

The Tsimshian Tribal Council has also been involved in the development of selective methods of harvesting salmon. These efforts have focused on beach seine and purse seine techniques in the lower Skeena, as well as on fish wheels near Terrace in Kitselas Canyon. The fishwheels operated by the Tsimshian have played important roles in tagging studies similar to those noted above, and have also contributed to the collective knowledge regarding selective harvesting methodologies.

In addition to these selective harvesting experiments operating as part of the inland commercial fishery, the Tsimshian have also been active in the monitoring and enforcement of all Aboriginal fisheries carried out in the lower Skeena and its approach waters.

Haisla

The Haisla people reside in the Kitimat estuary, which has become increasingly industrialised. Accordingly, the interest of the Haisla people has been focused on the perceived impacts of this industrialisation on the important food sources of salmon, and particularly eulachons. Anecdotal information suggested that eulachon runs in the Kitimat River were declining and becoming unsuitable for consumption due to poor flavour, possibly as a result of contaminants in the estuary. As part of the Sustainable Fisheries Program, the Haisla people have conducted studies to collect data pertaining to eulachon timing and abundance, and possible impact of contaminants.

Skeena Fisheries Commission

The Skeena Fisheries Commission (SFC) is a body formed by mutual agreement by the First Nations of the Skeena watershed, which includes the Ned'ut'en, the Gitksan, the Wet'suwet'en, the Gitanyow and the Tsimshian. Through this body, these groups have participated actively and fulfilled a key role in the consensus-based Skeena Watershed Committee.

In addition, the SFC has been the principal focus for a pilot Aboriginal Fishery Officer Training program in the Skeena River. This program, funded in part by the Sustainable Fisheries Program, has provided training and experience for Aboriginal Fishery officers from the Tsimshian, Gitksan and Wet'suwet'en First Nations. Training under this program covered a wide range of activities, such as fisheries monitoring, stock management, fishery enhancement and assessment and habitat protection. Upon completion of the program, Aboriginal fisheries officers enhance work carried out by DFO field staff and fishery officers under the authority of the Fisheries Act.

Forging a Partnership with The Skeena Watershed Committee

SKEENA WATERSHED COMMITTEE

The Skeena Watershed Committee was established in 1992 to foster communication and cooperation among the stakeholders in order to conserve, protect and rebuild the salmonid resources of the Skeena Watershed. Aboriginal, commercial and recreational sectors are represented on the Skeena Watershed Committee.

During the 1993 fishing season the harvest of a larger than expected return of Skeena sockeye and its impact on coho and steelhead precipitated intense conflict among user groups.

Conservation concerns over weak coho and steelhead returns required significant reductions in the commercial net fishing time. The management actions to limit the commercial harvest rate triggered protest rallies in Prince Rupert. At the same time, representatives from the sport sector were critical that DFO had not gone far enough in the restrictions on the commercial fishery.

A pivotal point of resolution to these management problems was the Skeena-Kitimat Sustainable Fisheries Program, with its emphasis on building partnerships to foster environmentally sustainable development.

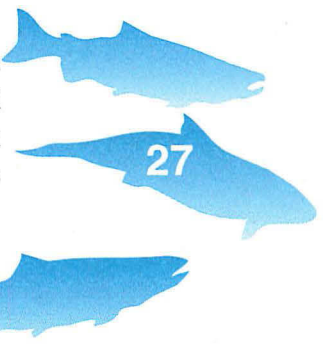
Under the program, DFO hired a consultant to facilitate a consensus-based approach to deal with the 1994 commercial fishing plan and the overall future direction of the Skeena River fisheries management. The Skeena Watershed Committee has been the vehicle for this initiative.

In May 1994 a consensus was reached by the Skeena Watershed Committee regarding a fishing plan for the Area 4 commercial salmon net fishery. A key component of this agreement was the Skeena-Kitimat Program and the resultant research and enhancement opportunities that would be developed using program funds. Consensus was also reached on the evolution of the Skeena Watershed Committee into a senior planning body on fisheries-related issues affecting the Skeena River.

In the interim, the committee has been fully integrated into the Skeena-Kitimat Sustainable Fisheries Program. Committee members have become full members of the Skeena-Kitimat Technical Committee, thereby actively participating in the development of projects.

In 1994, a Memorandum of Understanding was reached between DFO and the Province of B.C. to ensure that consultation takes place during the salmon season, with provincial input into management decisions during the peak weeks of steelhead migration.

Since coming together in 1992, the members of the Skeena Watershed Committee have forged strong links with one another. The theme for much of the work and discussions between the users is "northern solutions to northern problems." Each sector is responsible for the development of its own fishing plan through each sector's



process - the Skeena Fisheries Commission, the North Coast Advisory Board and the North Coast Co-management Committee of the Sport Fish Advisory Board. The plans are then reviewed in the Skeena Watershed Committee for consistency with the 1994 agreement and integration.

It is clear that the Skeena Watershed Committee is breaking new ground. Governmental participation in the Skeena Watershed Committee is significantly different from the historical consultative process. Traditionally, DFO has played the role of arbiter/referee between the sectors. As part of the Skeena Watershed Committee, the department's role is now that of a stakeholder. Many of the issues surrounding allocations have been left to the non-government stakeholders. The department still has fiduciary responsibilities for First Nations. However, the department's primary role at the table is to ensure that conservation objectives are being met.

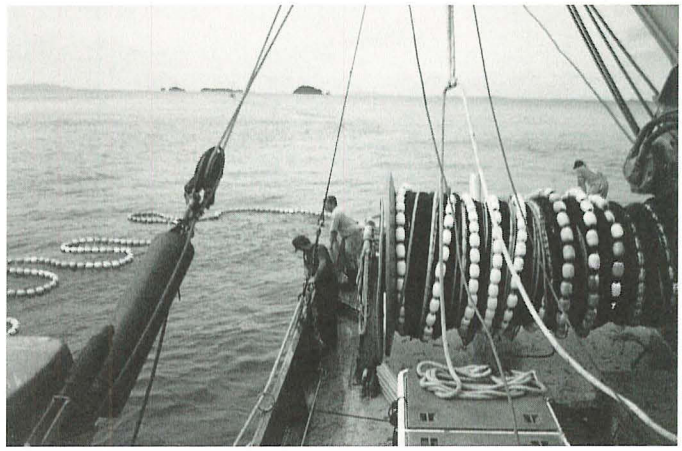
The committee meets two to four times throughout the year. To ensure efficient running of the committee, a Steering Committee has been established with one representative from each sector. The Steering Committee makes recommendations to the Skeena Watershed Committee on matters such as agendas for meetings, long-term policy direction, and more recently, the setting up of workshops. Additionally there have been subcommittees established to deal with more detailed matters that cannot be completed during a regular watershed meeting. For example, subcommittees have been established to deal with the Provincial Watershed Restoration Program and to establish the program structure for the provincially funded Skeena Technician Program, which is a key component of the Skeena-Kitimat Program.

The Skeena Watershed Committee stakeholders have direct input into the planning process of the Skeena-Kitimat Program through the Skeena Technical Committee. This committee is made up of representatives of:

- the Skeena Fisheries Commission (First Nations)
- North Coast Advisory Board (commercial sector)
- the North Coast Co-management Committee of the Sport Fish Advisory Board
- the Province of B.C.
- the Department of Fisheries and Oceans

The Skeena Technical Committee operates on a consensus basis. Projects have been categorized under the Treasury Board Objectives for the program into the following "envelopes":

- Sustainable Resource Management (Harvest Management)
  - selective harvest
  - in-season management
  - catch monitoring
  - escapement
  - radio tagging
- Habitat Restoration and Productivity
  - productive capacity
  - habitat protection restoration and enhancement
- Building Partnerships - People and Processes
  - socio-economic studies
  - consultation and communications
  - administration



In 1995 the Skeena Watershed Committee took on the task of organizing three key workshops. These workshops cover habitat restoration and enhancement, selective harvesting and the socio-economic status of the Skeena watershed. The intent of the workshops is to inform the Skeena Watershed Committee and the general public of the issues within each of the topics as well as to seek input from the public through discussion groups.

Enhancement Workshop (February 1995)

Presentations were made by government staff on the status of Skeena stocks and various enhancement techniques currently available. The discussion groups were asked three questions:

- What bio-diversity/conservation issues should the SWC address
- What habitat issues should the SWC address
- What enhancement issues should the SWC address

Selective Harvesting Workshop (May 1995)

The speakers were from the scientific and the First Nations communities, and included a local commercial harvester. The discussion groups were asked:

- What are the benefits to be achieved through selective harvesting
- What are the opportunities to introduce selective harvesting
- What are the issues related to catch and release fisheries as they relate to all sectors
- What should be the factors/objectives to be considered for selective harvest proposals
- How do we go about entertaining selective harvesting proposals. Options included:
  (a) how projects are reviewed and approved
  (b) process – i.e. who should participate
  (c) government policy requirements

The Skeena Watershed Committee is planning a Socio-Economic Workshop in January 1996. It is hoped that this workshop will enhance the productive work of the first two, thereby providing the committee with sufficient public input to start the process for a long-term vision of the watershed.

Financial Report
1993 - 1995 ($ x 1,000)

Harvest Management	$1,868.4
Habitat Restoration	905.9
Building Partnerships	983.2
First Nations Participation	3,750.0
Total	**5,007.5**

The Skeena Watershed Committee continued the work on the development and integration of the 1995 fishing plan during meetings in May 1995. As part of these meetings, an enforcement workshop brought together enforcement staff from the department, the Provincial Conservation Officer Service, and Aboriginal fishery officers/guardians. The integration of each sector's enforcement resources and fishing plans was the key objective of this meeting.

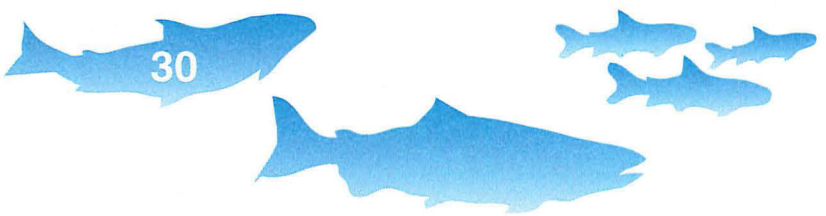
Future Roles

The Skeena Watershed Committee is the only consensus-based forum on fisheries management in Canada. As such, it is being held up as a model that may have application for other regions of the country. This is especially true as the department takes on a new role of "steering" as opposed to "rowing" stakeholder activities and development.

The work carried out to date under the auspices of the Skeena-Kitimat Program will serve as the foundation for the future management of the Skeena River. Stakeholders are aware that government has entered into a process that is fundamentally different from the historic approach. They are also realizing that their participation in fisheries management is increasing their stewardship role at the community level. These activities carry with them significant responsibilities as stakeholders attempt to gauge the desires and aspirations of the public they represent.

The field work from the first three years of the Skeena-Kitimat Program as well as the outcomes from the three public workshops will assist the Skeena Watershed Committee in understanding the resource and public expectations. The committee will commence discussions near the end of 1995 to develop a vision for the watershed.

DFO will be advancing a vision that includes: fisheries and habitat management direction, enhancement opportunities and development of innovative funding arrangements that could be utilized by the Skeena Watershed Committee to support the committee and carry out further work at the expiration of the Skeena-Kitimat Program. The final year of the program is intended to complete additional research and provide the bridging needed to start the implementation of this vision.



Moving Forward

The Skeena-Kitimat Sustainable Fisheries Program is an ambitious venture never before attempted in this area.

Enhancing Past Successes

First, it is building on past successes to maintain species diversity. There has been notable success in rebuilding depressed stocks in both the Skeena and Kitimat rivers. Chinook, for example, have been subject to a successful conservation and rebuilding program over the past 10 years. As well, Babine Lake sockeye stocks have expanded to record-high levels today from record-low levels in the 1950s through a program of harvest management and enhancement.

Stock Specific Fisheries Management

Reducing the commercial harvest rate of steelhead and protecting weak stocks such as coho is a major goal. To date, stock assessment information has improved significantly, which in turn allows fishery managers to better determine optimal harvest rates. Much work has also been done in the areas of catch monitoring and stock identification. More stock-specific management will also increase as gains are made in river escapement counts and escapement monitoring of index stocks.

Restoring Habitat

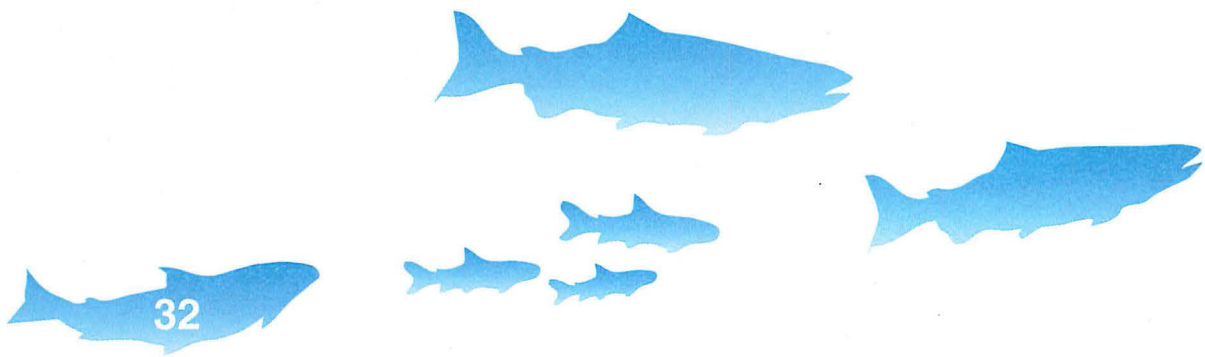
Progress has been made in protecting and restoring habitats on which fish depend. Habitat protection is a major focus in the Kitimat River system and its estuary. Ensuring that planning for development meets the needs of fish and their habitat is a long-term commitment that will continue in partnership with various groups over the course of the Skeena-Kitimat Sustainable Fisheries Program and beyond. Future work with the Province of B.C.'s Forest Renewal Program will be actively pursued.

Partnerships - The Key To The Future

Another major focus is building partnerships. New ties are being forged among all levels of government and all stakeholders to foster environmentally sustainable development. The end goal has far-reaching implications - to move this major West Coast fishery to a sustainable basis in the next four to five years. For the first time there is a willingness among key partners to get things done. The challenge is an enormous one, and much work remains to be done. Ultimately, the key to sustaining the fisheries resource for future generations depends on responsible fisheries resource management and an informed and motivated population.

The Future Depends On Us All

Government alone cannot achieve sustainability in the Skeena and Kitimat rivers. This task depends not only on programs such as the Sustainable Fisheries Program but on all watershed residents changing the way they treat the fisheries resource and the environment. No one can afford to be complacent - the risk of repeating past mistakes is too great. Safeguarding the rich fisheries resource for generations to come demands responsible action by all.



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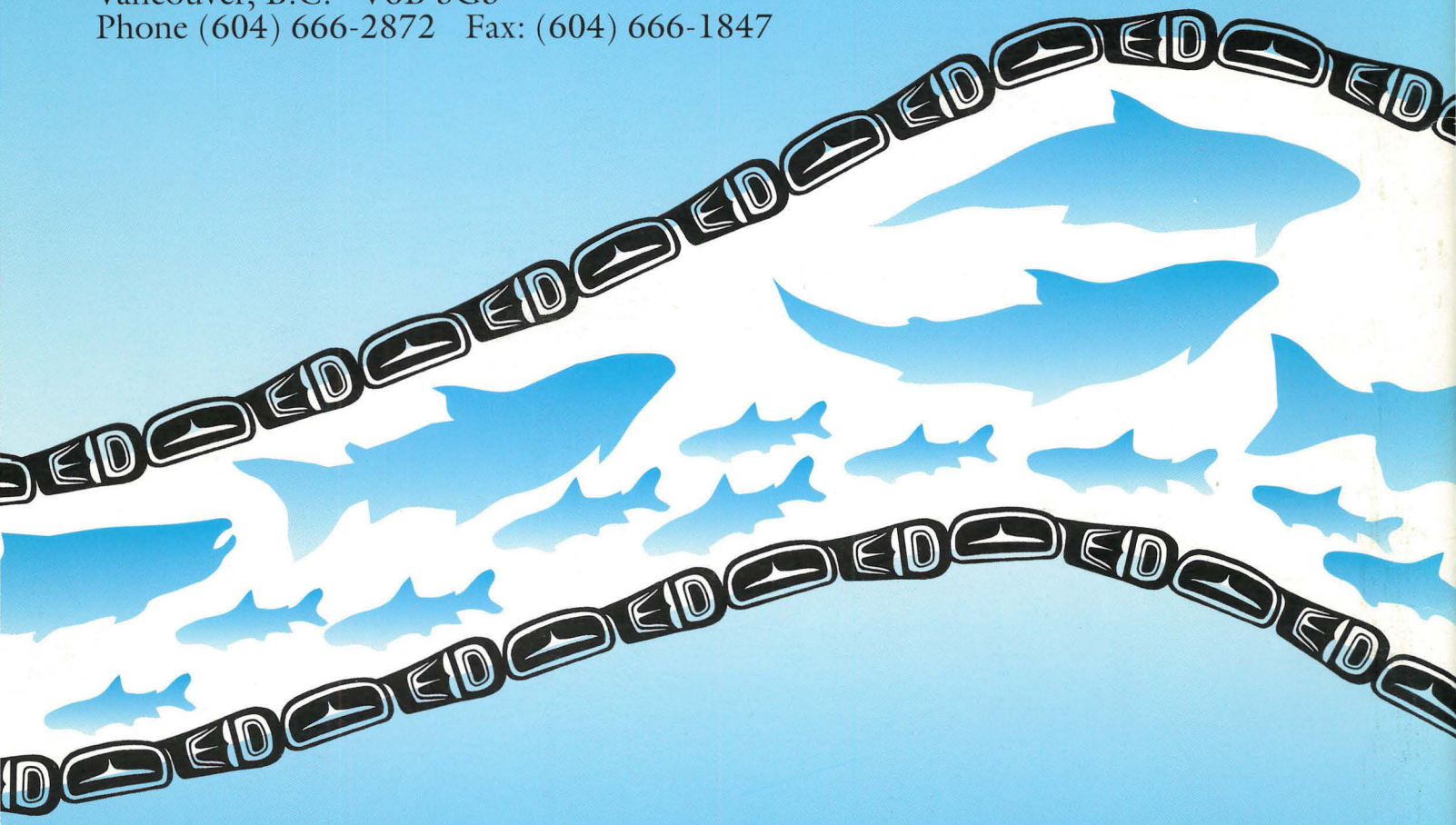

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