1992 DRAFT 2A/4
(expanded draft being prepared)

REALLOCATING A REGIONAL FISHERY RESOURCE: RESTORING ABORIGINAL FISHERIES ON THE UPPER SKEENA, BRITISH COLUMBIA

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Introduction

The Upper Skeena region of British Columbia (figures 1 and 2) is the ancestral home of two Indian tribes.[2] The lands along the Skeena River above Legate Creek, together with the area of its tributaries to the north and adjacent parts of the upper Nass watershed, constitute the traditional territory of the Gitksan (Morrell 1985:5). With the Nishga and the Coast Tsimshian, the Gitksan make up the Tsimshian language group, one of a number of groups of Northwest Coast Indians. To the south of the Gitksan territory lie the traditional homelands of the Wet'suwet'en. These include most of the lands of the Bulkley-Morice river system, which is a major tributary of the Skeena, as well as part of the upper watershed of the Nechako River in the Fraser system (figure 1). The Wet'suwet'en belong to the Carrier subdivision of the Athapaskan linguistic group, which latter is spread over vast stretches of the interiors of northwestern Canada and Alaska.

Despite their different language affiliations, the Gitksan and Wet'suwet'en have maintained distinct economic, social and cultural links since time immemorial (Morrell 1985:6). With Gitksan connections to coastal Indians and Wet'suwet'en connections to those in the interior, the two tribes together have been strategically placed in the historical Indian trading network. For

purposes of contemporary legal status and administrative organization, the Gitksan and Wet'suwet'en have combined under a joint tribal council, excluding the Kitwancool Band of the Gitksan, which has chosen to remain separate. The Gitksan-Wet'suwet'en Tribal Council represents approximately 7,000 members, of whom about 4,500 are "status Indians" with local rights of residence (Sterritt 1985:14).

The Gitksan-Wet'suwet'en Tribal Council has placed before the courts in Canada a claim to aboriginal ownership rights of traditional homelands (not including Kitwancool territory), measuring about 30,000 square miles (figure 2). The Gitksan and Wet'suwet'en never concluded a treaty with the intruding governing authorities established by the British and their Canadian successors. Thus the Gitksan-Wet'suwet'en hold that their rights in the territories claimed were never extinguished. Implicit in their claim are rights to the natural resources of the area for purposes of utilization and management. The Supreme Court of British Columbia ruled, in 1991, that the Gitksan-Wet'suwet'en aboriginal title to land had been extinguished, but the case has now been taken to the Appeal Court of British Columbia. The question of aboriginal fishing rights, in any case, was explicitly excluded from the B.C. Supreme Court judgment (Helin 1991:81). The precise legal status of aboriginal fishing rights as they apply to the Gitksan-Wet'suwet'en claims, remains unclear for the time being.

Historically, the Upper Skeena stocks of Pacific salmon have been a very significant staple food resource for the Gitksan and Wet'suwet'en. Consequently, the demand for control of the salmon stocks in their territory is of particular importance in their overall land claim. The Skeena salmon

exhibit a life cycle in which they migrate as juveniles to the North Pacific Ocean, but return to spawn in their native streams in the upper Skeena watershed. During the period that the stocks are outside Gitksan-Wet'suwet'en territory, they are of course subject to the harvesting operations of other user groups. Of necessity, the salmon stocks in question must be shared with these other groups.

The substance of the fisheries claim advanced by the Gitksan-Wet'suwet'en is a demand for a greater share of the Skeena River salmon catch, along with recognition of their right to manage the fishery in their own territory (Cassidy and Dale 1988). In general, federal government regulations currently allow them, within their territory on the upper Skeena, only to take salmon in a so-called "food fishery" for domestic use.[3] The Gitksan-Wet'suwet'en demand recognition of an historical right to harvest salmon in their territory for commercial purposes as well, and indeed point to the evidence that they have continued to exercise that right by selling salmon in contravention of Fisheries Act regulations.

In recent decades Indians increasingly have challenged in court the Fisheries Act regulations restricting their fishing rights (Helin 1992). They have had so much success--particularly with the landmark Sparrow case in 1990--that the Department of Fisheries and Oceans has become increasingly reluctant to attempt prosecution of Indian transgressions of the Act . However, the nature of the court cases in question, and the contents of the decisions, have been so complex as to leave the precise legal status of Indian fishing rights unresolved and open to much speculation (Pibus 1981, Binnie 1990). In any case, it remains clear that Indians can obtain a significantly larger share of

the salmon resource only by a process that will reapportion the harvest among different user groups.

The discussion in this paper will focus on two major considerations that need to be addressed in assessing the Gitksan-Wet'suwet'en claim. One is the question of equity. This involves exploration of the historical basis for the Gitksan-Wet'suwet'en claim to a larger share of the Skeena salmon resource than is currently available to them. It also concerns the implications of any reallocation of current harvest entitlements, with respect to claims for compensation by other user groups which may be disadvantaged by the reallocation. What is "equitable", of course, in the final analysis is a matter of subjective judgment. However, given that there are some widely held common notions of equity, the facts of the case may be left to speak for themselves.

The other major consideration to be explored is that of the overall economic consequences of a reallocation in favor of the Gitksan-Wet'suwet'en. Much will depend on the nature of the management regime that will be developed in implementing the reallocation. The paper will explore opportunities to use the implied changes in harvesting patterns to improve sustainable catches and net returns. I have neither the extensive data base nor the time and resources necessary to carry out an exhaustive cost-benefit analysis that would be required for refined estimates. However, enough general information is available on the fishery to allow some general conclusions to be drawn on the basis of informed speculation.

The Salmon Resource and its Management

The consequences of a successful claim by the Gitksan-Wet'suwet'en for greater access to Skeena salmon stocks cannot be comprehended without an understanding of the basic features of the salmon life cycle and the nature of the present fishery and its management. A brief outline is given in this section.

The fisheries claims of the Gitksan and Wet'suwet'en are overwhelmingly concerned with local stocks of six Pacific salmon species. In approximate order of their importance to the Gitksan-Wet'suwet'en, the species in question are: sockeye (Oncorhynchus nerka), chinook (Oncorhynchus tshawytscha), coho (Oncorhynchus kisutch), steelhead (Oncorhynchus mykiss), pink (Oncorhynchus gorbuscha) and chum (Oncorhynchus keta).[4]

Salmon, with some exceptions, are anadromous fish, i.e., they spawn in fresh water but migrate to sea where they spend most of their life. Aided by a well-developed homing capacity, the mature fish return to spawn in their native streams. Pacific salmon die shortly after spawning, except for steelhead which generally live to spawn more than once. Fish from each of the species may be divided into races, constituting unique breeding populations. Each race utilizes a particular set of gravel spawning beds in a particular part of a river system, with some cross-breeding among races of the same species resulting from occasional strays. Because salmon have a multi-year life cycle, spawning beds will be used by different races in successive years. Typical life-cycle lengths vary among species and races, ranging from two years for pinks to up to eight years for chinook. Some variation of life-cycle length within each species leads to some cross-breeding among fish of the same

species, but from races of unequal cycle-length, which are using the same spawning grounds.

An important factor affecting the total size of the resource is the extent to which available beds are used to full capacity for purposes of spawning. To obtain the best rate of reproduction, i.e., resulting in the largest number of surviving offspring, the number of spawners should be sufficient to utilize the available spawning beds fully. But the number of spawners should not be much larger than that, or else their spawning activity will so disturb the deposited spawn as to cause unduly high mortality of eggs and larvae, thus resulting in a smaller number of surviving offspring. Optimal management of salmon stocks means getting neither too few, nor too many returning fish onto the spawning grounds.

For management purposes fish populations are divided into stocks. Generally, fisheries managers attempt to define and identify stocks to coincide with distinguishable breeding populations. In the case of Pacific salmon, this means that, where possible, stocks are defined to correspond with identifiable races of particular species, so that managers may focus on the achievement of optimal spawning. They may attempt to secure this by opening and closing the fishery in particular locations to allow for safe passage of the right "escapement" for each stock, while ensuring that the harvestable surplus is taken in the fishery.

Fish from different species of salmon may be recognized from outward appearance. While fish from different races of the same species cannot be distinguished by sight, there are electrophoretic laboratory techniques by

which distinctions may be made. Spawning fish in each distinct breeding stock of the Skeena watershed tend to return together and to run up river at about the same time, so that the bulk of each stock passes through a stretch of river over a period of a few weeks or less. As each stock migrates at a particular time in the season, fishery managers are able, to some extent, to distinguish between different stocks of the same species by the timing of their migration runs and schedule appropriate closures accordingly.

With dozens of stocks in the Skeena system, there often are several migrating stocks mixed in the river at the same time. Some of these are likely to be strong and require only a short period of closure to secure sufficient escapement, while others are likely to be weak and require a longer period of closure--or even a complete closure--to guarantee adequate escapement. Managers are usually able to identify the runs of larger stocks easily and to secure escapement targets for these runs by manipulating fishery closures. But with closures keyed to the escapement targets for the larger stocks, it becomes difficult, if not impossible, to do anything to secure the right escapement for the smaller stocks that are mixed in with the larger ones.

The mixed stock problem has been exacerbated in recent years by the successes of the Salmonid Enhancement Program, carried out by the federal Department of Fisheries and Oceans in cooperation with provincial authorities and various local fishing interests. The objective of this program has been to increase British Columbia's salmon and steelhead resources by various artificial means. In the Skeena River system, an enhancement project on Babine Lake (figure 1) expanded the spawning capacity for sockeye salmon enormously through the construction of a large number of artificial spawning channels, to supplement

those naturally available. This has resulted in runs of Babine sockeye that dwarf the runs of other Skeena salmon stocks.

The enhanced Babine sockeye stock can stand a high rate of exploitation and still produce adequate escapement. Accordingly, fisheries managers have allowed heavy fishing on the Babine sockeye runs. This has resulted in serious depletion of smaller wild stocks that are mixed in with the Babine sockeye and that cannot stand the same level of fishing pressure. Reduction or destruction of the smaller wild stocks is a serious matter. This is so not only because these stocks will no longer contribute to the total salmon catch. A more important consideration, probably, is the reduction in the available gene pool. The large stocks of enhanced salmon are drawn from a gene pool of restricted size and may prove vulnerable to disease. Successful rebuilding of stocks depleted by disease may depend crucially on being able to draw sufficient numbers of spawners with disease-resistance characteristics from the remaining wild stocks.

Because many of the smaller Skeena salmon stocks are threatened with extinction, fisheries managers have imposed some fisheries closures to reduce the threat. In turn, this has resulted in large numbers of surplus Babine sockeye being wasted in some years, because they could not be fished during the closures. An important management problem now is to find ways of providing a greater harvest of fish from existing strong stocks and those capable of significant enhancement, without destroying or seriously weakening the smaller wild stocks.

To solve the mixed-stock problem, an obvious strategy would be to disjoin the

fishing effort on different stocks as much as possible, targeting each stock separately at a point where it was not mixed with other stocks. Usually this would mean fishing a stock as it entered a tributary specific to its spawning grounds. In this fashion the fishery on each stock could be regulated separately to allow for an optimum spawning escapement., Such stock-by-stock management, allowing for a "terminal fishery" on each separate stock, would offer considerable benefits in terms of increasing production from the salmon resource towards its maximum potential. I will return again to the subject of "stock-specific" management after discussing past and present patterns of salmon fishing on the Skeena.

The Traditional Indian Fishery

There is prehistorical evidence of the utilization of fish resources by the people inhabiting the Upper Skeena region. Numerous settlements were established in prime fishing areas (MacDonald et al. 1987). While relevant archaeological exploration has not been extensive, excavations have turned up bone fragments of salmon and other fish at four sites, namely at Hagwilget where Gitksan and Wet'suwet'en areas meet (Ames 1979), at Kitwanga in Gitksan territory (MacDonald 1989), and at two Kitselas Canyon sites adjacent to present Gitksan territory (Allaire 1978, Coupland 1985). Some of the fragments may date back as far as 2000 B.C.

At the time of European contact in the late eighteenth century it was evident that the Northwest Coast Indian tribes had developed societies which had--in relation to time and place--a notable level of material sufficiency, cultural expressiveness and artistic refinement. Fish resources played an especially

important role in providing them with a plentiful supply of food, in response to which they developed a variety of ingenious and very efficacious fishing techniques. These have been described effectively, attractively and artistically by Hilary Stewart (1977) in her book on Indian Fishing. Among the fish resources salmon were evidently the most important, Garfield (1951:13) writes: "Salmon was the decisive food resource of the Tsimshian [i.e., comprising the Gitksan, Nishga and Coast Tsimshian], as it was of most other Northwest Coast tribes. Cohoes or spring salmon and sockeye salmon furnished the bulk of the fish dried for winter use ...."

To the Gitksan and Wet'suwet'en, salmon were the all-important fish resource. Salmon were available to them in great abundance on their predictable annual spawning runs and were easy to capture in the confined waters of the upper Skeena and its tributaries. The great variety of other coastal species were not within the reach of these up-river tribes. For them "the truly abundant resource was salmon" (Ray 1984:2). Indeed the salmon fishery was so important a means of subsistence to them as to determine their settlement pattern. Ray (1984:69) comments: "When Europeans first reached the Gitksan-Wet'suwet'en-Babine area in the 1820s they discovered that the local native population was settled in a number of relatively large villages. The subsistence of the people was based heavily on their fisheries which, with about two months of work per year, allowed them to meet most of their food needs. Villages were located besides their fisheries."

In the case of the Gitksan and Wet'suwet'en, in particular, one may rightly speak of a "salmon economy" and a "salmon culture". Surplus production from their salmon fishery constituted a major export commodity in the extensive

trading network maintained with other tribes (MacDonald et al. 1987, Morrell 1985, Ray 1984). For the tribes on the Skeena salmon were also of prime importance in the "potlatch", a traditional feast system of great social and cultural significance to Northwest Coast Indians, underlying their system of prestige, authority and mutual obligation (Adams 1973, Garfield 1951, Morrell 1985). The potlatch was marked by great festive consumption and emulous generosity in the gifting of staple goods and chattels--prominently including salmon products in the case of the Skeena region. Potlatch practices were subjected to repressive legislation, introduced in 1876, subsequently reinforced in 1921, but eventually repealed in 1951.

When, in the early 19th century, the Hudson's Bay Company (HBC) brought the fur trade to their region, the Gitksan, Wet'suwet'en and neighboring tribes gained an opportunity for a significant extension of their salmon trade. Indian caught salmon--both fresh and smoke-dried--became an important staple for the provisioning of the HBC, and later also for other frontier groups, such as miners and construction workers (McDonald 1985:164, Morrell 1985:23-24, Ray 1984). Salmon was so important a commodity that it was accepted as a form of currency, with a well-known exchange rate (Ray 1984:25 and 63-64).

In their traditional fishery, the Indians of the Skeena made use primarily of a variety of highly effective weir and trap systems (Stewart 1977, Morrell 1985:24-33), which intercepted salmon on their migration paths. These systems, operating under the authority of local chiefs, were eminently compatible with effective conservation. Fish were easily taken from the traps or along the weirs with dipnets, gaffs and baskets. When enough fish was taken to occupy

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fully those engaged in processing the fish, the weirs and traps would be opened to let migrating fish pass through. Intermittently, the weirs and traps would be put into operation again to provide further raw material for processing, which mostly involved smoking. This fishing system assured bountiful harvests with escapement that was quite adequate to maintain the stocks in a healthy state, as is evidenced by the prosperous condition of the tribes at the time of European contact and the healthy state of the salmon stocks then observed.

The Gitksan and Wet'suwet'en observed a strict system of ownership rights and management authority in respect of fishing sites and hunting territory (Morrell 1989). In the case of the Gitksan, ownership attached to extended family groups, or "Houses", with House chiefs excercising authority on behalf of their groups. Clan chiefs held similar authority among the Wet'suwet'en. Individual families were often assigned rights in respect of particular fishing sites. This system of ownership and authority remains largely intact today within the Gitksan and Wet'suwet'en communities, despite the impediments resulting from the intrusions of Canadian authorities.

The establishment of the first salmon cannery at the mouth of the Skeena River in 1877 marked the beginning of a Euro-Canadian commercial salmon fishery. Initially it relied to a great extent on local Indian labor, with the men employed in fishing and the women in processing. Over the ensuing decades, the commercial fishery expanded by attracting non-Indians from outside the region. Competition for raw material with local tribal fisheries became more acute. Government fishery managers, evidently preoccupied with the interests of the Euro-Canadian dominated commercial fishery, were concerned that the effective

weir and trap fisheries of the up-river Indians would take "too much" fish and endanger the stocks. In reality, of course, it was the additional pressure of an expanding commercial fishery that upset the pre-existing balance of catches and escapement, leading initially to large increases in harvests, but thereby depressing stock strength and threatening sustainability of catch levels.

As the commercial fishery on the Skeena expanded, progressively tighter restrictions were placed on up-river Indian fishing (Lane and Lane 1978, Morrell 1985). There were two principal forms of restriction. One was to gradually suppress the effective Indian weir and trap fishery, eventually leading to outright prohibition of these devices--referred to as "barricades" by fisheries officials. The other was to reduce the authorized catch of Indians by limiting it to the satisfaction of domestic needs, while prohibiting the Indian salmon trade. Fishery officials, on the whole, appeared ignorant of the sound principles of resource conservation underlying the Indian barricade fishery and oblivious to the rights and needs of the Indian community in its dependence on the fishery resource.

John T. Williams, Inspector of Fisheries, in 1905 reported to the Dominion Commissioner of Fisheries as follows (Williams 1906):

> With regard to the Skeena River I may say that the conditions existing at the head waters are dangerous in the extreme (a detached report of which I herewith enclose), more especially on the Babine lake, and unless drastic measures are adopted by the department at once to check the illegal fishing by the Indians, now in operation and to ensure the protection of the salmon, we may speedily look for the complete

annihilation of this valuable fish and entire depletion of the river, and shall have another example of ruination of an extensive industry exactly coexistent with the conditions prevailing on the Fraser river at the present time.

Inspector Williams added an extensive report by Fishery Officer Hans Helgeson (1906), regarding two Indian barricade operations on the Babine River. The latter appeared greatly impressed with the most "formidable and imposing appearance" of the barricades, "constructed of an immense quantity of materials, and on scientific principles." He remarked on some of the "beautifully made" detail of the "magnificent fence which not a single fish could get through." Helgeson described the barricade site as a hive of activity and went on to remark:

> The banks of the Babine river have a lovely appearance at this place and a most wonderful sight met our eyes when we behold the immense array of dried salmon. On either side, there were no less than 16 houses 30 x 27 x 8 feet filled with salmon from the top down so low that one had to stoop to get into them and also an immense quantity of racks, filled up outside. If the latter had stood close together they would have covered acres and acres of ground, and though it was impossible to form an estimate, we judged it to be nearly three quarters of a million fish at those two barricades, all killed before they had spawned, and though the whole tribe had been working for six weeks and a half it was a wonder that so much salmon could be massed together in that time.

Despite his evident admiration for the industriousness of the Babine Indians, Fishery Officer Helgeson showed no hesitation in his determination to enforce government orders against the Indians and to uphold the official view, regardless of the consequences for the Indians. In reporting on his meeting with the Chief at the site of one of the barricades he wrote:

> I informed him that I was sent by the government to destroy and remove all barricades and any other obstructions that prevent the salmon from getting up to their natural spawning grounds. That the government had wisely adopted this policy on account of salmon having sadly diminished in all the rivers along the coast just on account of barricades in nearly every stream throughout the whole country. That the fish which providence intended to go into lakes and streams for the purpose of propagation were slaughtered at the barricades before they had spawned, and I gave him to understand that the barricades must be removed immediately.
>
> And at intervals during the conversation I explained the fishery laws and regulations, that they must not use barricades and only fish one third the channel with their nets or any other contrivance, that they must observe the close season, they must not sell fish as they had done in the past, but only take enough for themselves and their families, and must not kill more fish than they use and not waste any.
>
> The chief advanced many points and some of them were well taken, he said they have had an indisputable right for all time in the past, that if it was taken away the old people would starve, that by selling salmon they could always get <u>iktahs</u> [i.e., "goods"], and he wanted to know to what extent the government would support them, he thought it unfair to forbid them selling fish when the cannerymen sold all theirs, and I had

> to promise him to tell the government to compel the canners to let more fish to come up the rivers, as some years they did not get enough, that the canners destroyed more spawn than they, that formerly he could not see the water below his barricade for fish, that they were so plentiful that some of them were force out on the beach, but latterly they had diminished, little by little every year.

But Helgeson was not to be moved. He continued:

> I met all his arguments in a prompt manner, and sent back those who showed a spirit of resistance, by telling them that they had committed a gross breach of the law, that they had put in their barricades this year notwithstanding the inspector had by letter forbid them to do so, and that if they resist and do not destroy the barricades nothing will save them from punishment or imprisonment.

Helgeson's authority appeared to be compelling. He recorded how the Indians carried out his orders immediately to utterly destroy the barricade. Continuing his long report, he recorded how he visited numerous other river sites throughtout the area, seeing to it that all barricades at these sites were destroyed. Interestingly, he continued to express admiration for the variety of ingenious trapping devices built by the Indians in conjunction with their barricades. Nevertheless, he showed no twinges of conscience in causing their destruction, apparently holding fast to the belief that they could not be justified in fishery conservation terms. Summing up his observations in one large district he remarked that "... when we take into consideration that nearly every salmon stream in the country is barricaded and that this has gone

on for years and years, is it not then a great wonder that there are any fish at all left?" Perhaps, what is the greater wonder is that Helgeson would not show any hint of acknowledgment that the survival of healthy salmon stocks over the thousands of years of Indian fishing with their accustomed devices was obvious proof that the barricades, as operated by the Indians with alternating openings and closures at their accustomed rates of exploitation, were entirely compatible with stock conservation.

Though the authorities may have evinced ignorance in branding Indian fishing practices as innately incompatible with conservation, there is good reason to believe that the British Columbia salmon stocks were seriously threatened. The Indian fishery, by itself, had proven to be sustainable on the evidence of a long past. But the combination of a strongly developed salt-water fishery and continuation of the traditional Indian fishery for domestic consumption and trade goods might well spell overfishing. While the Indians on the Upper Skeena were not the originators of the new pressures on the fish stocks, they were easy targets to blame for the results. Apart from having little influence with the government, the media or the general public, they were also in the unfortunate position of being the last user group in line along the migration path of salmon to their spawning grounds. The ultimate onus of letting enough fish through to make up an adequate escapement, by force of circumstance was then placed on them. Any attempt by them to maintain their historical harvest levels, in the face of much greater catches downstream, except in very good years might then have the "depensatory" effect of not leaving enough spawning escapement (Peterman 1980).

The foregoing account indicates that a large part of the salmon resources held and utilized by Indians in the Upper Skeena region a hundred-or-so years ago, was forcibly taken from them, without any significant compensation. It was handed over, essentially free of charge, to a new user group favored by the government and protected by the force of law. The Indians were compelled to use often inefficient and wasteful fishing practices with nets and gaffs, instead of weirs and traps. The supply of food fish left to them was at times inadequate, occasionally leading to actual starvation (e.g., in 1916). Their salmon trade, which supplied them with many needed goods, was prohibited in law and greatly inhibited in practice. The descent of the Indian tribes concerned from economically and culturally vibrant societies, by their standards of place and time in the mid-nineteenth century, to socially and materially depressed communities an hundred years later, without any reasonable doubt is due in part to the severe reduction in access to the salmon resource that they suffered. The equity implications of the foregoing require no elucidation. It is well nigh impossible to believe that a similar discriminatory act of confiscation would be undertaken, or even contemplated, by any Canadian government in the present day and age. And surely, any attempt in that direction would be quickly negated by the courts. Indeed, the courts are now busily engaged in reversing, to some degree, the effects of the injustices exemplified in the above account.

There is a concept in law, known as the "abstention principal", which is used both intra- and internationally. It holds that when a (fishery) resource is fully exploited by a user group, no new group is entitled to join in the exploitation of that resource. Canada and the United States have called on this principle in persuading Japan and other countries to refrain from fishing

for salmon of Canadian or American origin in the North Pacific. The principle, in fact, is enshrined in Article 66 of the United Nations Convention on the Law of the Sea. Past actions of the Canadian government in suppressing Indian fishing rights would appear to constitute a flagrant violation of the abstention principle.

After the removal of barricades, Indian fishers on the Upper Skeena were restricted, largely, to using gaffs and nets, which were relatively inefficient and damaging to the stocks. When gaffs are not used in conjunction with traps or weirs that inhibit the escape of fish, they become a wasteful technique. Many fish drop off gaffs gravely wounded and die. In an open river fishery they cannot be retrieved and are therefore lost both for purposes of consumption and spawning. Similar stock damage results when nets are lost in swift-flowing river waters and continue to entangle and kill fish ("ghost-fish"), unseen and unattended on the river bottom.

Current User Groups and Product Patterns

The salmon fishery has been referred to as a gauntlet fishery. After spending much of their life on ocean feeding grounds, salmon return to the coast to assemble in concentrations which migrate upstream to spawn. In doing so they must "run the gauntlet" of various fishing groups intercepting them along the way. The order of interception has significant implications. Fishing fleets that are furthest out to sea have the first opportunity to capture returning fish and thus have the largest amounts of fish available for exploitation. Fishing groups on the river can exploit only what is left of the stocks after other groups have taken their catch, but they do have the advantage of fishing

in confined waters where fish are concentrated in a narrow passage so that they are easy to capture.

Part of the Skeena salmon stocks return to the river via Alaskan waters, where the Alaskan fleet has the first opportunity to fish them. All Skeena salmon pass through Canadian coastal waters where they are subject to a commercial fishery conducted by trollers using hook and line gear and seiners using purse seine nets. Next in line is the commercial gillnet fleet, operating mostly in or near the estuarial waters of the Skeena. It is only after all commercial fleets have taken their catches that the various Indian bands on the Skeena have an opportunity to exploit the remainder of the stocks for their food fishery. And the Gitksan-Wet'suwet'en on the upper stretches of the river get their turn after the Tsimshian on the lower river. One further user group should be noted. There are sport fishermen angling for salmon and steelhead, both in coastal waters and on the Skeena and its tributaries.

It is important to note that with the techniques and equipment they possess, the various groups exploiting the salmon stocks of the Skeena have a joint fishing capacity several times as large as what is needed to take the entire harvestable surplus. If no constraints were placed on their fishing effort they would be capable of fishing the Skeena stocks to extinction in a few years' time, with each group blaming the others for the result. Only the restraint of government regulation and management has prevented this from happening.

The terms of the Canadian-American salmon fisheries agreement regulate and restrain mutual interception of salmon returning to the waters of the two

countries. Within Canadian waters it is the nature of fisheries regulations imposed by the federal government, including time and area restrictions impacting diversely on the different components of the harvesting sector, that is the prime determinant of how much fish each group is able to take. Thus the government in effect has assumed responsibility for determining what will be the allocation of benefits from the fishery among the various user groups.

Economic Efficiency

Fisheries regulation and catch allocation have bearing both on efficiency in resource use and on equity in the distribution of benefits among user groups. Efficiency may be measured in terms of the total value of net benefits, i.e., the total value produced minus the costs of production. Efficiency calculations are not free of conceptual controversy and practical ambiguity, with which this paper will not attempt to deal. However, two major considerations in the matter of efficiency that are important in the arguments raised by the Gitksan-Wet'suwet'en claim, will be explored in some detail. They concern the quantity and quality of fish harvested.

One consideration, then, is that of increasing the total production of fish from Skeena salmon stocks. As indicated above, stock-by-stock management is a desirable objective to make fullest use of available spawning beds and thereby increase stocks to the largest size possible. There is considerable mixing of Skeena stocks in coastal waters where they are targeted by the commercial fleets. But in the river, stocks are separated in part by the timing of their runs. As they move up river the stocks separate further by turning into the different tributaries on the way to their respective spawning areas. The

higher up river one goes, the more stock separation takes place, allowing for better stock-specific management and achievement of escapement targets through terminal fisheries.

The Gitksan-Wet'suwet'en are demanding a major allocation of salmon to allow them to conduct a substantial commercial fishery in addition to their food fishery for domestic needs. The most appropriate gear for their in-river commercial fishery would probably consist of traps, which they used historically, but which have long been banned. Traps are an economical device for the harvesting of fish and have great utility in escapement management and in catch handling. Traps may be constructed to allow fish to be readily live-sorted by species. Fish from weak stocks may be released unharmed and fish that are retained may be butchered in their freshest condition. In the case of the Skeena fishery, the traps would allow fish from the valuable but weak stocks of steelhead, chinook and coho to be released entirely, which would help to rebuild those stocks. The large surpluses that are available from enhanced sockeye stocks could be fully harvested, overcoming the waste that now occurs when the fishery on the surplus sockeye is closed to prevent more serious depletion of smaller wild stocks.

There has long been a major argument against in-river fishing, viz., that Pacific salmon deteriorate greatly in quality when they enter fresh water. This contention underlies a widely-accepted conventional wisdom that there cannot or should not be any commercial in-river fishery. Recently this contention has come under closer scrutiny. It is no doubt true that the physical condition of Pacific salmon changes while the fish move upstream on their spawning migration, as they use up body reserves along the way. It is

also true that deterioration of the flesh of migrating salmon may become so severe as to render the fish unsuitable for human consumption. But the extent to which change or deterioration takes place varies greatly by species, river system and specific stock. On the Skeena, generally speaking, chum and pink salmon show a distinct deterioration in quality as the fish move up river, while sockeye, chinook and coho are much less affected. Steelhead, which unlike Pacific salmon continue to feed on their spawning run and which tend to survive to spawn more frequently, are essentially unaffected.

Extensive quality testing of sockeye caught in-river on the Skeena was undertaken for the Department of Fisheries and Oceans in 1982 (Slaney and Birch 1983). The results generally showed that sockeye caught in the lower river were of "number one" quality and those caught further upstream were of "number two" quality, which is entirely acceptable for human consumption. Fish taken near Hazelton, the hub of the Gitksan-Wet'suwet'en territory, were found suitable for export grade canned products and yielded smoked products of "acceptable quality".

The "number two" grading of up-river fish apparently was based largely on water- and netmarking of fish, which were taken by gillnets. This problem would be alleviated by a trap fishery, which has beens proposed for a new Gitksan-Wet'suwet'en commercial fishery (Morrell 1985). It bears noting, of course, that up-river Indian groups in British Columbia have used local salmon for ages as a highly appreciated staple food and as a valuable trading commodity. Their continuing illegal trade demonstrates that the general population also find their smoked salmon an attractive product. It is evident that an up-river Indian commercial fishery has the potential for producing

readily marketable commodities.

Ocean-caught salmon has qualities that cannot be matched in every respect by salmon harvested up-river. Ocean fish, it appears, is superior in producing some commodities, particularly in the fresh and frozen product sector. Evidently there is a trade-off between quality and quantity of fish when harvesting is moved into and up the river. The coastal catch produces fish that is of a better quality, at least for some purposes. However, the up-river fishery allows for better management and thus larger harvests. Much more research and practical experience is needed to produce a refined calculation of this trade-off, which will vary both with the amount of fish taken in different locations and the distance by which the fishery is shifted along the river. One may speculate that optimum economic results will be achieved in an intermediate position that balances quality and quantity considerations. Presumably this would require an up-river fishery substantial enough to make a significantly larger escapement of fish from weak stocks possible. This would be consistent with the establishment of an in-river commercial fishery by the Gitksan-Wet'suwet'en that would be managed to achieve optimally selective escapement. But even with such a shift one may expect the coastal fleet to remain a crucially important component of the harvesting sector.

The Skeena has a large salmon fishery. The shift of a moderate share of fishing effort to up-river locations might suffice to yield significant benefits by reducing pressure on critically weakened wild stocks. This would be so, particularly, if fishery closures in coastal waters were made to coincide as much as possible with the passage of migrating fish from the weaker wild stocks. In conjunction with fuller utilization of surplus enhanced

fish, one may anticipate that the total harvest from the Skeena system would be increased significantly, so that catch gains upstream would be much larger than catch losses downstream. With the upstream fishery yielding a product that is only modestly reduced in quality, it is reasonable to expect that the larger harvest would result also in a larger total value of output.

Of course, one needs to guard against too large a shift in effort from the coastal fishery to upstream locations. For this might result in the loss of too large a share of fresh, frozen and other top quality output on which the market depends. It might also strain the capacity of the market to absorb a larger volume of those products that are obtainable form lower quality fish. One must further recognize that any notable shift in effort will take time to implement, while facilities and skills are developed upstream.

There is another efficiency consideration that should not be overlooked. It is noteworthy that employment prospects in Indian communities are particularly low. Neil Sterritt, the then- president of the Gitksan-Wet'suwet'en Tribal Council, in 1985 estimated unemployment among his people to be in the range of 65-95 percent, resulting in obviously serious social problems (Sterritt 1985:14). The provision of a worthwhile amount of employment that would result from the establishment of a commercial in-river fishery for the Gitksan-Wet'suwet'en is likely to have a positive impact on the economy as a whole, by reducing structural unemployment. It is true that some employment downstream would likely be displaced, but this might be absorbed by normal turnover of labor in the coastal commercial fishery. In any case, the coastal fishing labor force is drawn from a population that generally has much better prospects for alternative employment than are available to upstream Indian

communities. It is, of course, also important that increased employment in an industry that is highly compatible with traditional activities of Indian communities may help notably to reduce the social problems from which they have suffered.

Distributional Effects

Predictably, there has been a strongly negative response to the Gitksan-Wet'suwet'en fishing claim from other users of the resource, including some Indians working in the commercial fleet. Other user groups naturally fear that more fish for the Gitksan-Wet'suwet'en will mean less fish for them. Of course, in any initial reallocation of the catch this would be the case. However, the stock-specific management that would be possible with the shift of a greater share of the effort upstream, could result in significantly larger total harvests. This could mean more fish for the Gitksan-Wet'suwet'en and no less fish for others in the long run. The chances for such an outcome will be reinforced if current plans to direct salmonid enhancement effort more towards assisting weaker stocks are successful. Indeed, in the long run this could well result in much larger catches for all harvesting sectors, including the coastal fleet. These remarks are based on no more than modestly informed speculation. A great deal more research needs to be undertaken to allow for reasonably firm estimates of benefits and costs.

To make the establishment of an in-river commercial fishery for the Gitksan-Wet'suwet'en at all palatable to commercial fishermen, it would no doubt be necessary to provide them with compensation for any reduction in the coastal harvest. A sufficiently generous buy-back program of vessels and

licences from fishermen prepared to retire from the industry might suffice. If an adequate number of fishermen were withdrawn, the remainder could be left with no reduction in their average catch. This might not satisfy the processing companies who would fear reduced throughput for their plants. However, the larger total harvests in prospect, plus the possibility that some of the Gitksan-Wet'suwet'en catch would flow through their establishments, might result in an outcome that they would find acceptable eventually, if not immediately.

A reduction in the size of the present commercial fleet has advantages, regardless of any catch diversion to an up-river fishery. For the catching capacity of the current fleet is vastly in excess of any current or prospective future needs, resulting in greatly excessive harvesting costs in relation to the value of the catch (Pearse 1982). A rationalization of the fleet through a reduction in the number of vessels is capable of generating much greater net benefits for the harvesting sector. Unfortunately, attempts at rationalization so far have not been very successful (Pearse and Wilen 1979; Copes 1992). The federal government, however, appears to have a continuing commitment to further efforts at rationalization. A reduction of the coastal salmon fleet to accommodate more up-river fishing could be made part of any larger program of effort rationalization.

It is interesting to note the reaction of sport fishermen to the Gitksan-Wet'suwet'en claim. Sport fishermen are likely to benefit significantly from stock-specific management. Their target species consist largely of steelhead, chinook and coho, all of which are represented by stocks that have been quite vulnerable to depletion in mixed-stock fisheries. Sport

fishermen initially were concerned about the claims by the Gitksan-Wet'suwet'en for more fish, which might be in part at their expense. Many have now discovered that a shift of commercial fishing effort from the mixed-stock coastal fisheries to an up-river Indian fishery could result in much better conservation of the stocks with which they are primarily concerned. They have in fact become allies of the Gitksan-Wet'suwet'en in this matter.

Management Authority

The Gitksan-Wet'suwet'en Tribal Council commissioned a fish management study (Morrell 1985) that proposed a stock-specific management strategy essentially along the same lines that I have suggested in this presentation. But it also recommended "that Tribal Council take the necessary legal and political steps to establish a Gitksan and Wet'suwet'en fishery agency with full authority over fishery management within the territory and with a mandate to negotiate with agencies from other jurisdictions regarding management of Skeena stocks while they are outside of Gitksan and Wet'suwet'en territory."

This latter proposal, taken literally, raises serious questions from a management perspective. Fully effective management requires that the fishery for the entire Skeena stock complex be regulated and coordinated through a single authority which is able to follow a consistent overall plan and to discipline all participants so that they will not exceed their catch allocations or otherwise subvert the plan. This single authority also needs to retain the power to engage in "on-line" management, i.e., to impose fishery closures and other strictures at short notice in any part of the system, in

order to react to stock conditions ascertained by constant monitoring. The need to bargain continuously with Americans over interception of Skeena fish in Alaskan waters is already enough of a debilitating circumstance. To concede similar ongoing bargaining powers to individual Canadian user groups could well lead to serious unresolved (perhaps, unresolvable) conflicts among user groups and a consequent erosion of effective management.

Much of the spirit of the Gitksan-Wet'suwet'en management proposal undoubtedly can be accommodated in an effective management regime. Given, particularly, the strong propensity for controversy and confrontation in the fishing industry, there is merit in the establishment of a "co-management" process between a senior (government) authority and user groups in an effort to foster cooperation, understanding, and mutual advice (Pinkerton 1985). Some elements of this process are already present in Canadian fisheries through various advisory councils. However, this falls short of co-management, which implies that some ongoing decision making powers are exercised by user groups directly, or jointly, under agreement with the constitutionally empowered authority.

Considering the disparate and often opposing interests of different user groups in respect of Skeena salmon stocks, it would seem useful, if not essential, for a senior authority to retain whatever decision-making powers are necessary to resolve conflict or to take quick and decisive action on urgent day-to-day management questions. But there is room, no doubt, for some delegation of management responsibilities to user groups, provided these responsibilities are not subject to serious conflicts of interest, are carried out competently, and are adequately monitored. Indeed, there are signs that

the Department of Fisheries and Oceans has an interest in exploring the possibility of management structures involving Indian community-based fisheries (Cassidy and Dale 1988:194).

Undoubtedly, most Indian tribal groups with a serious interest in fisheries will find it unacceptable to be considered just another supplicant "user group" seeking a favored share of the fishery resource from an omnipotent federal government. In the current mood of self-assertion, "First Nation" peoples are more likely to demand recognition of unextinguished and unextinguishable rights to fishery resources, including many that have been lost to them through attachment of these resources by other user groups. There seems little chance of their demands being met in full, given the overwhelming political authority and the power of much greater numbers held by the non-Native-Indians of the country. In addition, in the particular case of the Gitksan-Wet'suwet'en interest in the highly migratory salmon stocks, there is an unquestionable need for a dominant central authority to maintain effective overall management and to arbitrate conflicting demands of the many competing user groups.

Despite the aforesaid, there should be a good deal of room for a shift in fishery resource access in favor of the Gitksan-Wet'suwet'en and for some meaningful participation for them in the management process at the local level. The courts, for one rationale or another, already have shown themselvers quite sympathetic to the Indian case for greater resource entitlement. Most politicians--and the majority of the general public--seem now prepared to acknowledge past injustices inflicted upon Native people and to offer a measure of redress. An appartent readiness to concede a measure of

self-government, would have as a logical corollary the competence to participate in resource management decision-making in an appropriate context. At the very least there should be room to undertake productive local management tasks, including enhancement operations, that could be performed under the aegis of a Gitksan-Wet'suwet'en fishery agency.

Conclusion

A full assessment of the implications of the Gitksan-Wet'suwet'en claims for recognition of enhanced fishing rights will require a great deal more research time and resources than I have been able to devote to this paper. What I have tried to convey is that there is ample casual evidence that much of what is in the Gitksan-Wet'suwet'en proposals may prove to be feasible and may have considerable merit from both biological and economic management perspectives. I have also tried to emphasize that the consequences for other user groups need not be very harmful in the short run and in the long run may prove beneficial.

It is obvious that resolution of the Gitksan-Wet'suwet'en claim involves equity considerations of great importance. In recent times there has been increasing recognition that many of the developments undertaken by Euro-Canadian interests under Euro-Canadian authority have infringed the rights of native people. In many cases court decisions and political agreements are now providing redress in one form or another.

It appears that the Gitksan-Wet'suwet'en a century ago had an independent

native economy that was prosperous by the standards of its time and circumstance. This economy was wrecked, in part by the encroachment of a commercial fishery developed by Euro-Canadian interests. On its behalf the government in effect confiscated a large part of the salmon resource that had been a mainstay of the Gitksan-Wet'suwet'en economy and destroyed the better part of its fishing equipment. A reallocation of part of the Skeena salmon harvest to allow reestablishment of a significant Gitksan-Wet'suwet'en commercial fishing industry would provide at least partial redress for the effect of past injuries inflicted upon the Gitksan-Wet'suwet'en community. The form of redress is important. By providing a significant amount of much needed employment in an area that is highly compatible with the traditional activities of the community, it may help significantly to overcome the chronic conditions of economic depression and demoralization from which the community now suffers.

The present day commercial fishing industry cannot be held responsible for injuries to native groups caused by previous fisheries developments. If there is to be a reallocation of fish to native fishing interests, there would be a case on equity grounds to provide fair compensation to operators in the fishing industry that were adversely affected. Fortunately, the reallocation may help to create superior conditions for salmon fisheries management, which could be translated into improved economic returns in the industry and provide the government, directly or indirectly, with the means for compensation.

The current Gitksan-Wet'suwet'en claims may be settled by the courts, or by a political process, or by a bit of both. But by whatever process, it is to be hoped that the solution arrived at will be made compatible with sound use of

the resource, with a high level of benefits to society, and with equitable results for native people and for other user groups.

Acknowledgments

The research for this paper has benefited from grants awarded by the Science Subvention Program of the Department of Fisheries and Oceans, by Simon Fraser University from its Special Research Project Fund, and by the Social Sciences and Humanities Research Council of Canada. I am indebted to Tasha Carrothers for excellent in-depth research assistance and to Greg Taylor for his guidance in my exploration of the Skeena River fishery and in establishing contact with many of the groups having an interest in the fishery. Additional research assistance by Diane Hutton and Tai Shzee-Yew is gratefully acknowledged. I wish to express, further, my appreciation to the many individuals from the Gitksan-Wet'suwet'en community, from the Skeena River commercial and recreational fishing sectors, and from the Department of Fisheries and Oceans, who have given me of their time to discuss the fishery issues with which this paper is concerned. My thanks also go to my colleagues Roy Carlson, Marvin Stark and Chris Wright for helpful discussions and provision of relevant background information.

Notes

1 This paper originated with a research project that was started by the author in 1987 and initially reported upon a year later (Copes 1988).

Intermittent work resulted in a number of revised versions. The paper presented here incorporates significant extensions of the original paper. It draws particularly on important earlier work by Morrell (1985).

2 There is room for argument as to where the "Upper" Skeena starts. For purposes of this paper it is assumed to start at the boundary of Coast Tsimshian and Gitksan territory, between Terrace and Kitwanga, and to extend to the north and east from there.

3 Individual Gitksan-Wet'suwet'en tribal members, may seek to acquire a commercial fishing license in the limited entry tide-water fishery, and some do so.

4 Steelhead are a sea-run form of rainbow trout. The rainbow/steelhead species originally (as Salmo gairdnerie) was considered to belong to the Salmo genus, which includes many trouts as well as Atlantic salmon. Recently it has been reclassified to the genus Oncorhynchus, which is made up of the various Pacific salmon species.

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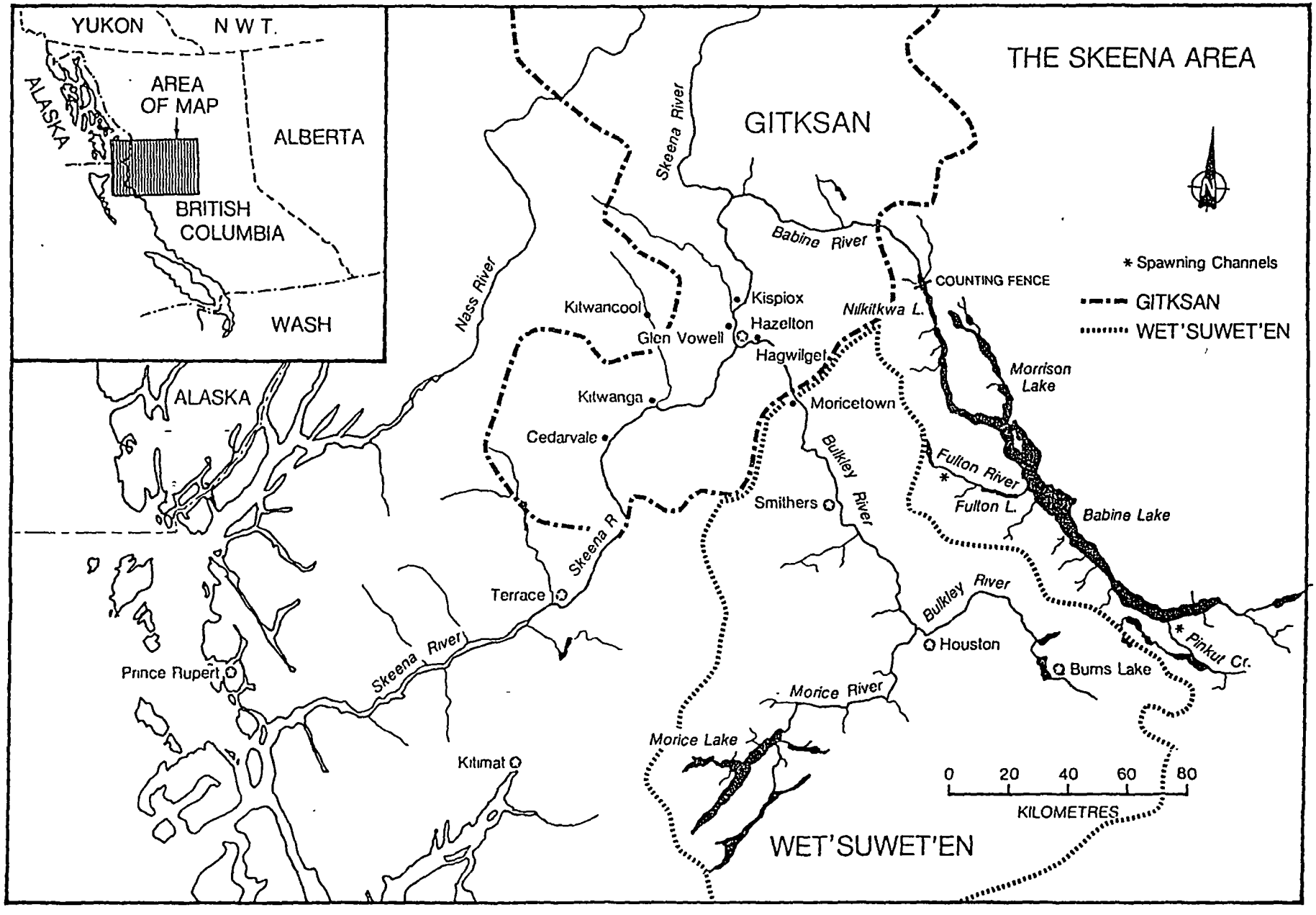
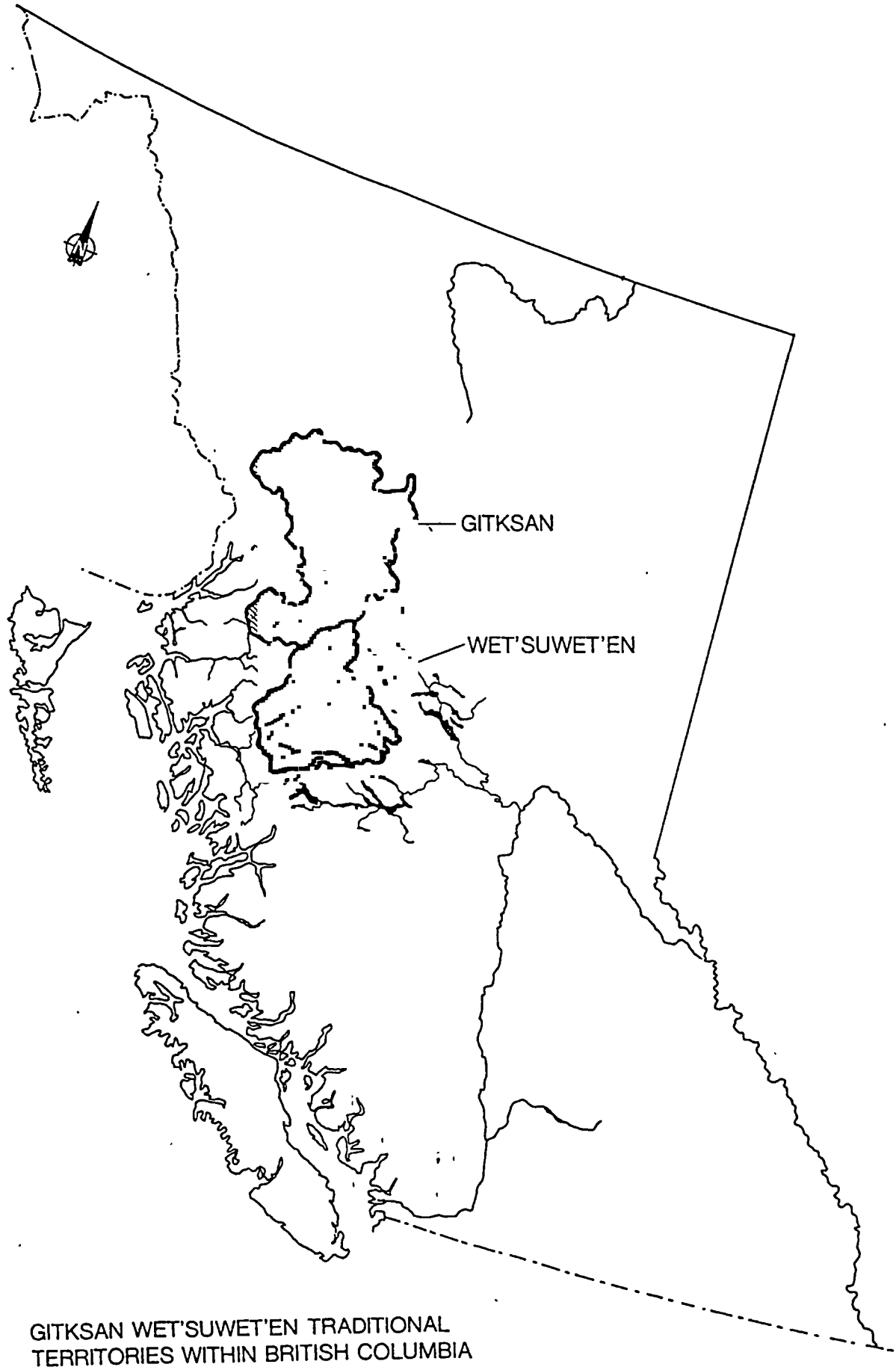

THE SKEENA AREA
YUKON
N W T.
ALASKA
AREA OF MAP
ALBERTA
BRITISH COLUMBIA
WASH
GITKSAN
Skeena River
Babine River
Nass River
Kitwancool
Kispiox
Hazelton
Glen Vowell
Hagwilget
Nilkitkwa L.
COUNTING FENCE
* Spawning Channels
GITKSAN
WET'SUWET'EN
Morrison Lake
Kitwanga
Moricetown
Cedarvale
Bulkley River
Fulton River
Fulton L.
Babine Lake
Smithers
Skeena R
Terrace
Bulkley River
Houston
Pinkut Cr.
Burns Lake
Skeena River
Prince Rupert
Morice River
Morice Lake
Kitimat
0 20 40 60 80
KILOMETRES
WET'SUWET'EN

Fig. 1

Fig. 2



GITKSAN WET'SUWET'EN TRADITIONAL
TERRITORIES WITHIN BRITISH COLUMBIA