SOUNDER

Staff newsletter of the Department of Fisheries and Oceans, Pacific Region

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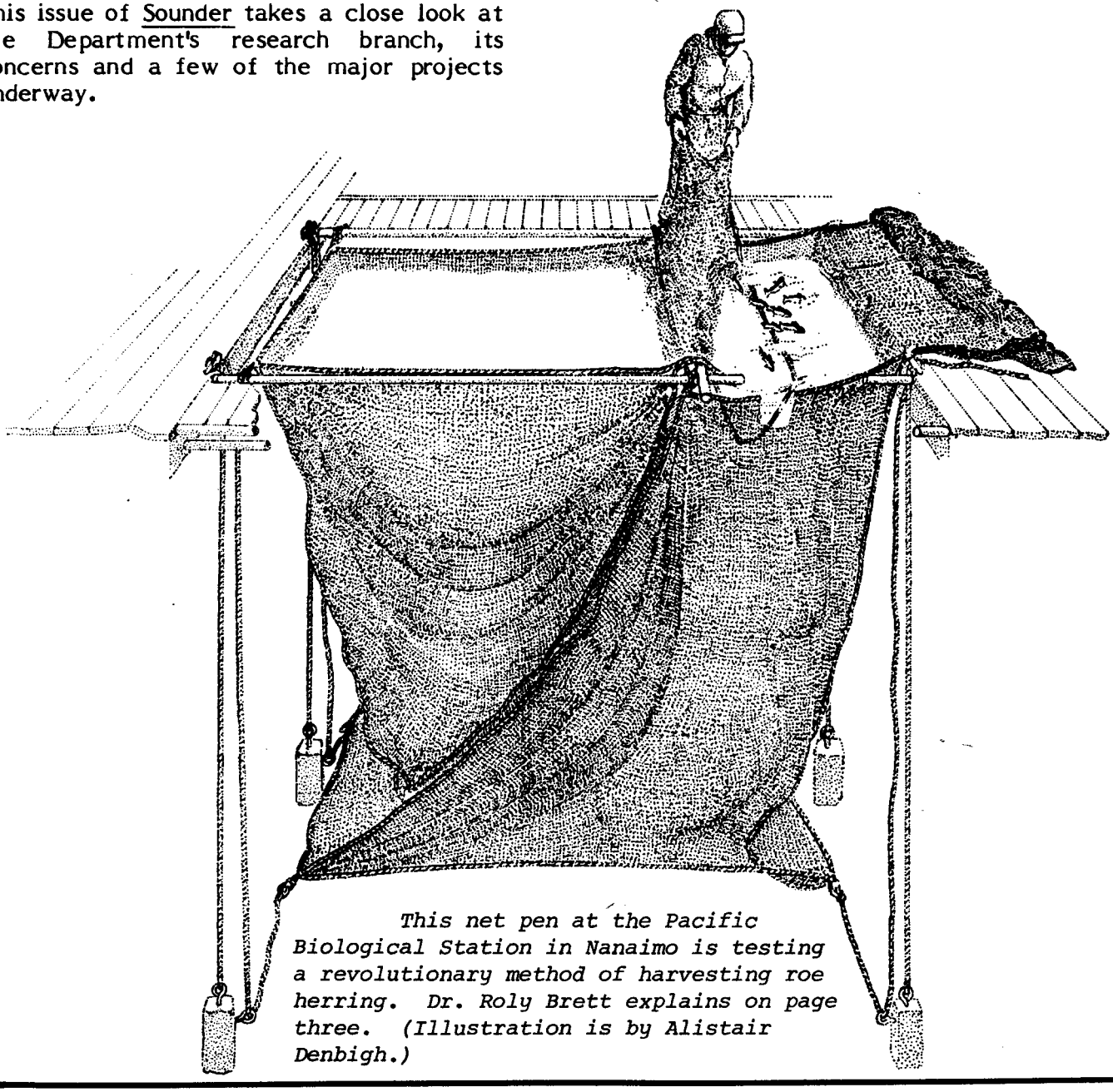
The Research Connection

The key to many of the problems affecting Pacific Region fisheries lies with research currently being carried out by the Resource Services Branch. Rapid evolution of the west coast fishing industry demands that those involved with the management, enforcement or enhancement of the fisheries obtain new tools and methods. This issue of Sounder takes a close look at the Department's research branch, its concerns and a few of the major projects underway.

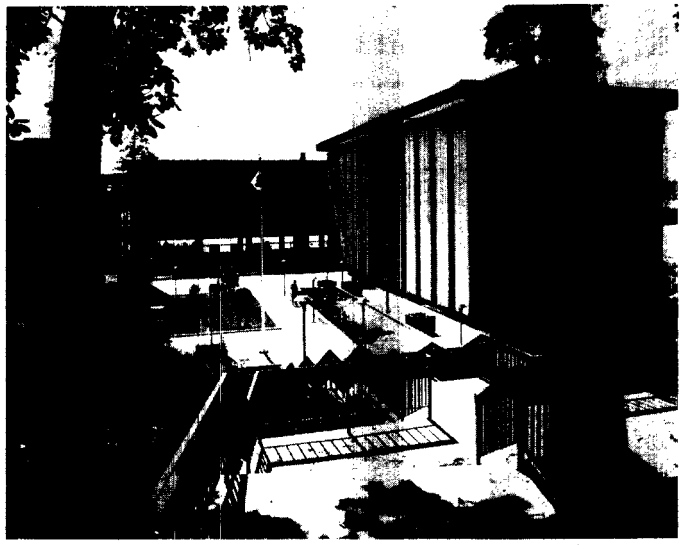
- **The status of wild chinook in B.C.**
- **Research on roe herring impoundment**
- **The Carnation Creek project**
- **Stock assessment research**



This net pen at the Pacific Biological Station in Nanaimo is testing a revolutionary method of harvesting roe herring. Dr. Roly Brett explains on page three. (Illustration is by Alistair Denbigh.)

Resource Services
The Branch in perspective

Nanaimo, British Columbia, has been the site of one of Canada's premier research establishments since 1908. The Pacific Biological Station, along with the Atlantic Biological Station located in St. Andrews-by- the-Sea, New Brunswick, will celebrate its Diamond Jubilee in 1983. Initially staffed by volunteer summer workers who lived in a residence building or camped out in the grounds, the Branch now has a complement of 156 and includes the laboratory at West Vancouver and a small staff located at the Pender Street headquarters. It is interesting to note that many early pioneers of fishery research spent time at Nanaimo. Early records show such names as David Starr Jordan, A.G. Huntsman, E.E. Prince, W.F. Thompson, and A.T. Cameron.



Pacific Biological Station in Nanaimo will celebrate its diamond jubilee in 1983.

Although mandates, directions and priorities for the research component of Pacific Fisheries have shifted and changed over the years, the essential thrust of providing information, technology and management tools has remained constant. As the Pearse Commission Interim Report points out, although research is costly, there is also a cost associated with inadequate knowledge. Later in the same report, Pearse states, "There is an urgent need for an environment that will facilitate effective teamwork among research scientists, economists, biologists and managers, overcoming the past divisions among institutions and responsibilities." This is very true and serves as a direction for the future of this Branch.

The past few years have seen many demands for research attention; the resurgency of the herring fishery, the assumption of authority over the 200-mile fishing zone and the establishment of a major program to enhance production of salmonid stocks. There are also the problems associated with the increasing size and efficiency of the commercial fleet, and urban and industrial development, particularly in the northern regions. All these require immediate responses, which this Branch must necessarily and legitimately satisfy. However, long-term solutions will come only with continued research, requiring both time and support.

What of the future? We need to re-establish a salmon population dynamics program, develop a salmon genetics program, investigate the consequence of habitat loss as it relates to changes of salmon stocks, put greater emphasis on understanding factors that influence herring stock abundance and behavior, conduct

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formal stock assessments for all important species, and turn our gaze northward towards fishery problems in the Yukon and northern British Columbia. At the same time, long-term programs in shellfish, groundfish, salmon culture and fish health must continue. Development along these lines will take time and effort, but it must be done. We know this and are dedicated to the fulfillment of these goals. The torch lit by those early volunteers must not and will not fade and die.

Dr. Dick Beamish
Director
Resource Services Branch

Roe herring impoundment shows promise

Throughout last year, research scientists working with the Fisheries Development Program tested and developed a new method of harvesting roe herring involving impoundment in nets or pens until the herring reach maturity. Since the usual practice of harvesting the roe herring over the spawning grounds has presented numerous problems, impoundment could provide management and industry with an answer.

Early in January 1981, the first test shipment of live herring arrived at the Pacific Biological Station in Bill Cameron's 18 metre barge, Bill's Ark, towed 32 km by his gillnetter, Herring Girl. The herring had been seined in Stuart Channel, near Yellow Point. In keeping with the best fish-handling practices, the fish had never left water, and in most cases had never touched a net. As they were crowded by the pursed net, they swam out of the seine into the large stern opening of the nearly submerged barge. In Departure Bay, where the salmon-farming netpens were moored, the process was reversed; the barge was backed up to the edge of an empty netpen, the cork line wrapped around the flange of the stern opening, and the herring were induced to swim out. Less than one percent showed any serious descaling or bruising. The success of this shipment of 1.8 tonnes and a further 4.5 tonnes the next day was preeminently vital to the research program extending over four months of impoundment.

It all began with the Fisheries Development Program under Bob McIlwaine and staff member Norm Sigmund. Norm and his supporters were convinced that herring were damaged on the spawning grounds by fishing gear and that apparent depletion in some traditional fishing areas was attributable to such practices. It was proposed that up to 1,000 tonnes of roe herring be caught away from the spawning grounds in advance of maturation and held in large impoundments, so that the roe could be harvested at an optimum stage

Why not? After all, bait herring are impounded; herring are caught by weirs and held in traps. In a test case, food herring had also been impounded using a shore pond and a floating pond in Knight Inlet in December, 1978. As well, roe-on-kelp ponds involve impounding, though only briefly.

But herring are fragile, sensitive fish, easily stressed and not known for prolonged survival in impoundments. More than one serious problem, causing heavy losses, has been experienced. Therefore, the "boardroom" decision was not to jump in too fast and too deep. The plan was to check local expertise by letting some contracts for commercial testing at the 200 tonne level; to examine the impoundment technology in other areas; to initiate a research program as an expanding pilot operation to identify causes and, where possible, solve the anticipated problems of mortalities, disease, stress, maturation, and control of spawning.

To house the research program, the full facilities of the Biological Station fish farm were put to use. These included seven netpens (two of which were under cover) of two sizes: "large" being 8 m x 8 m x 8 m, and "small" being 5 m x 5 m x 5 m. In addition, four 5,000 L temperature-controlled fiberglass tanks were used, set at 5°C, 7°C, 9°C, and 11°C. The factors studied included effects of density, feeding, cover (reduced excitement), and temperature as these affected survival, maturation, spawning delay, and roe quality.

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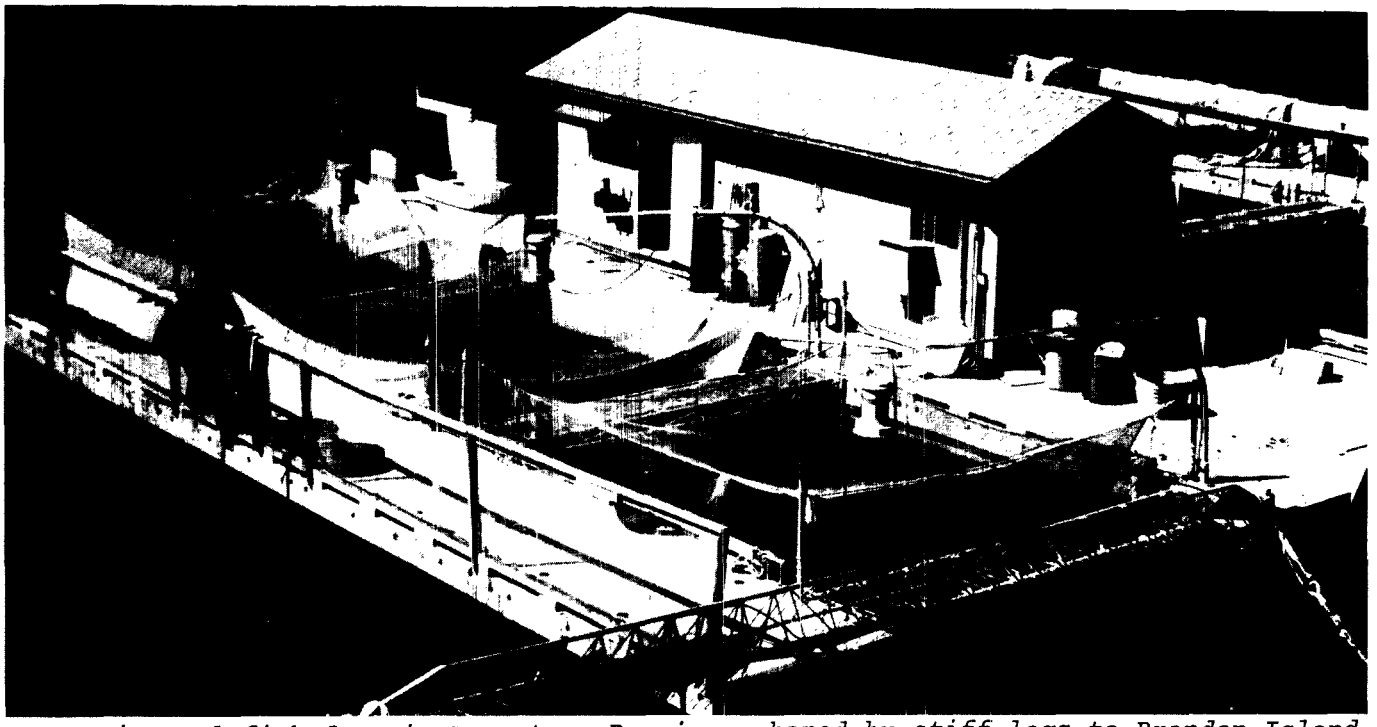


Experimental fish farm in Departure Bay is anchored by stiff legs to Brandon Island, one half km from the Biological Station.

continued from page three

The two factors that produced greatest mortality for the 120-day impounding period were density in excess of 8 kg/cu m, (0.5 lb/cu ft), and elevated temperature (11°C). In the densest net, losses reached 10 percent by the 87th day and rose steadily to reach 30 percent at the commencement of spawning (110 days). In all other netpens, losses did not exceeed 10 percent by spawning time. Death occurred mainly as a stress reaction to crowding, reducing the immune-response capacity and resulting in massive bacterial proliferation, particularly in the kidney. Handling that caused loss of mucous and scales, and possible bruising, contributed to mortality.

Maturation of the roe proceeded as the ovary went from an initial ten percent of total body weight on January 5 to 25 per cent at a fully mature state by March 15. No further weight gain was recorded, but roe quality improved over the next ten days. Of interest was the observation that no treatment (density, feeding, cover) or state of health (stressed, disease ridden) affected the ovary in terms of development and quality; it had a high functional priority assuring its quality and integrity even in moribund specimens.

Important among the initial findings was the fact that although the herring matured in the netpens and ovulated, most of the stocks did not spawn for 30 to 45 days afterward. Reasons for the long delay are speculative. They include (in probable order of importance): 1) early capture and confinement away from any spawning grounds; 2) fouled netting presenting a "dirty" surface; 3) temperatures below 10°C and high salinity; 4) absence of any free sperm and a lack of maturation synchrony.

All told, the results were encouraging. Herring could be impounded for over 100 days without high mortality. Good quality roe could be obtained. Harvesting could be conducted over a four-week period. Long haul barging, which may be needed, was quite successful. Potential diversion of the popular roe herring fishery away from the spawning grounds had taken a definite step forward.

In the coming 1982 season, tests, including economic assessment, will be conducted on a 45-tonne operation. If this proves successful, a further expansion to the 180 tonne level is contemplated.

Dr. Roly Brett
Pacific Biological Station
Nanaimo

Resource Services

New hope for wild chinook

For several years now, fishermen and resource managers have been concerned about the status of our wild chinook stocks. The impression is that everywhere they are dwindling away. This concern has been underlined in the past two seasons by below average catches and poor escapements. I have analysed the available information on coastwide catch and escapement for chinook to see just how badly off we are and to determine what should be the optimum escapement for B.C. chinook.

Certainly escapement to B.C. rivers has declined considerably, from an estimated 350,000-400,000 in the early 1950s to less than 200,000 in recent years (Fig. 1). Escapement has declined in all regions of the coast, and all sizes of spawning populations have been affected about equally. An exception is escapement to the Fraser River. Returns to the river mouth have declined substantially, but escapement has been maintained at 60,000-80,000 by cutting back the rivermouth catch.

While escapement has been declining, the catch of chinook by B.C. fishermen has been increasing, from less than one million in the early 1950s to around 1.7 million in recent years. Increases in catch are recorded for all gear types except gillnets. The gillnet catch has declined since about 1970, largely due to restriction on catch in the Fraser River fishery.

Clearly, a fishery characterized by increasing catches and declining escapements is bound for disaster in the long run. Unfortunately, a straightforward interpretation of these events in the chinook fishery is made impossible by the fact that B.C. fishermen intercept a lot of U.S. chinook (and vice versa), and hatchery production of chinook in both the U.S. and Canada has increased dramatically. The catch of chinook by B.C. fishermen, therefore, is not a good indicator of how many wild B.C. chinook are caught coastwide.

To support our negotiations on salmon interceptions with the U.S., we have estimated the percentage of U.S. chinook in the B.C. catch and the percentage of B.C. chinook in the U.S. catch. I used these percentages to calculate the coastwide catch of B.C. chinook by both Canadian and U.S. fishermen (Fig. 2). The coastwide catch of B.C. chinook has increased since 1951, but not as much as the catch of chinook by B.C. fishermen. This is due largely to the northward dispersal of B.C. chinook stocks in the ocean which has resulted in the lower fishing pressure in northern B.C. and Alaska. This northward dispersal means that our chinook fishermen have benefitted greatly from the migration of U.S. chinook into the more northerly B.C. waters.

From these data and information on the age composition of B.C. fish in the fisheries, I have calculated a stock and recruitment relationship for B.C. chinook. The result is revealing (Fig. 3). Even though spawning stock has declined since 1951, total recruitment from each brood year (the sum of catch plus escapement) has increased for all but the most recent years. Our chinook stocks are certainly overfished, but the degree of overfishing is much less than we at first suspected. Quick management action is still necessary. If we don't act to

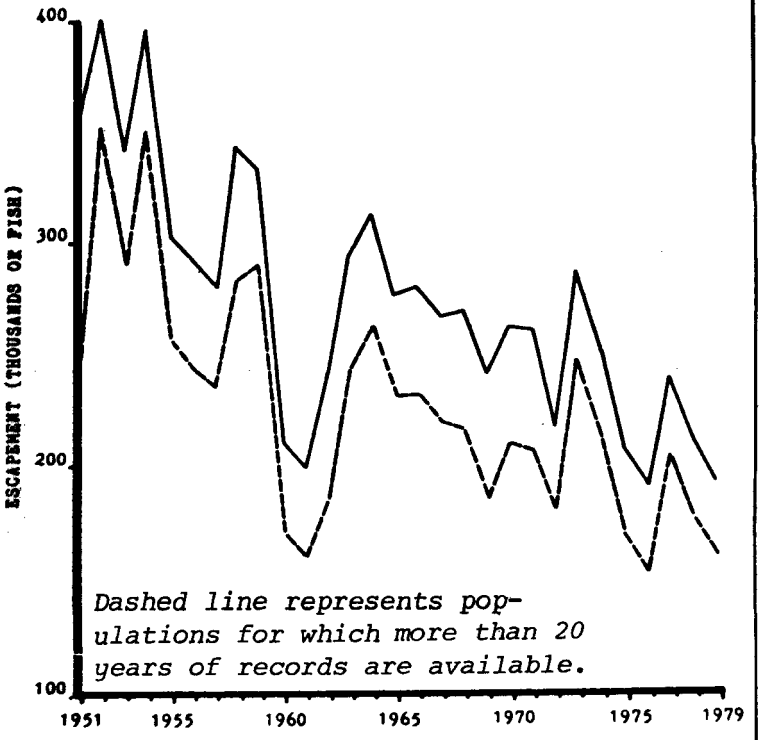


Figure 1: Chinook escapement to B.C. rivers (1951-1979)

conserve our wild stocks, they will quickly slide into oblivion down the steep left hand limb of the stock and recruitment curve. But the curve does indicate that rehabilitation is well within our grasp and that maximum yield from our wild stocks occurs at a coastwide escapement of between 200,000-250,000, not at some unattainable historic escapement.

Mike Healey
Resource Services Branch

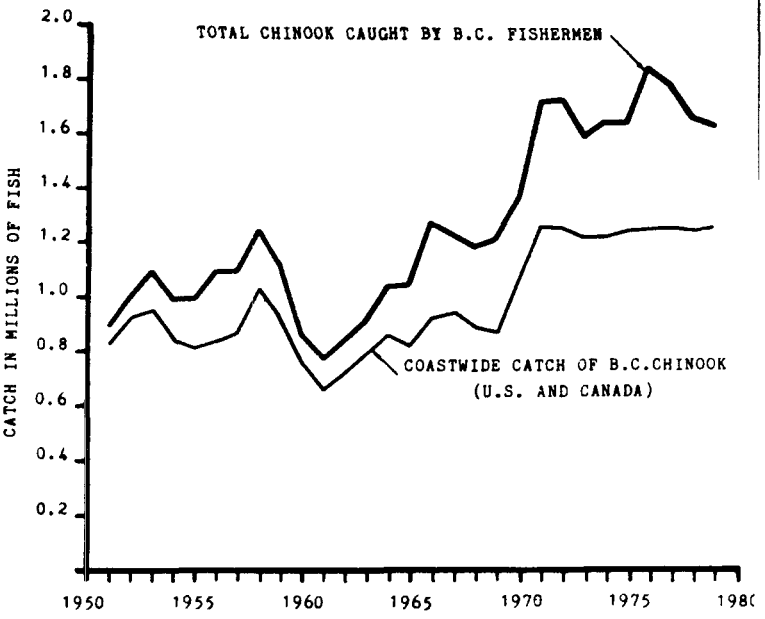


Figure 2: Coastwide catch of chinook by Canadian and U.S. fishermen

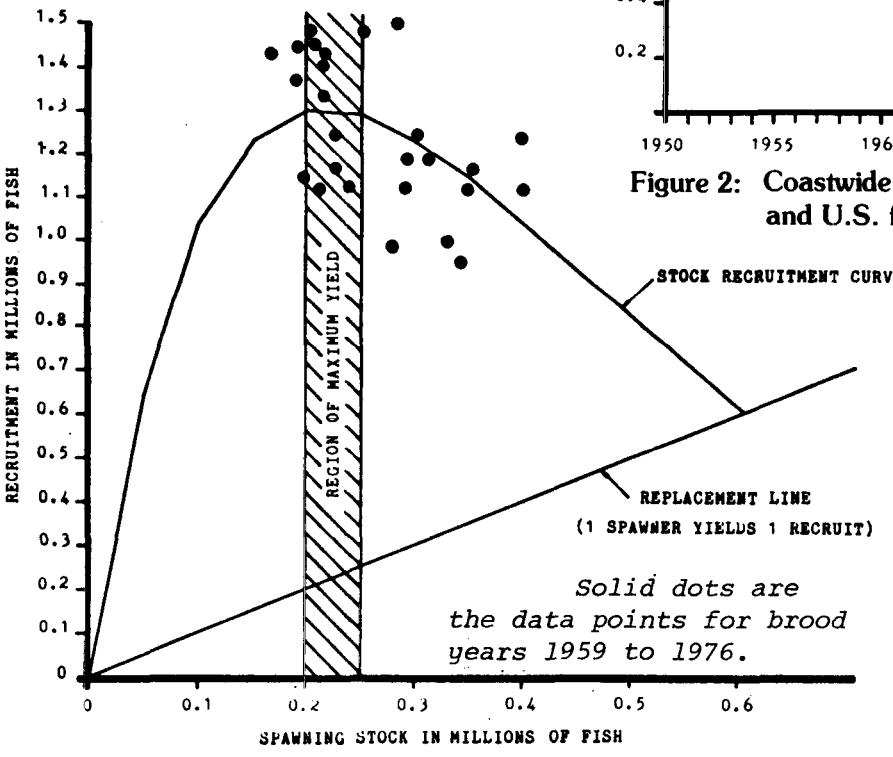


Figure 3: Relationship between stock and recruitment of B.C. chinook

Call of the Salmonid

Are you sitting on a story idea that readers of the Salmonid newsletter would enjoy hearing about?

The Department employs many staff who work throughout B.C. and the Yukon. There are, without doubt, many incidents, experiences and perspectives dealing with the salmonid resource that have not yet surfaced into the public domain. Let me help you express your ideas in print. Please call me at 687-1442 and we'll discuss it.

Terry VanderSar,
Writer,
Salmonid Newsletter.

Numbers game causing problems

The basic principles of the proposed Canada/U.S. salmon agreement impose immediate demands for improved assessments of Canadian salmon stocks. These principles (see box) translate into a need for improved data on escapement, fishing patterns, and fishing fleet capabilities by species, time and area. Indeed, the disagreement between U.S. and Canadian biologists concerning production from Canadian portions of the transboundary rivers and the interception balance in southeast Alaska and northern British Columbia is a major barrier in progress towards a final agreement.

Canada/U.S. agreement

Canada and the United States agree to cooperate by regulating fisheries on intercepted stocks to ensure their "optimum yield," by increasing the production of salmon and by harvesting the production in "an optimal manner," by conserving intercepted stocks and providing each other with benefits commensurate with salmon production from their respective rivers. In working towards these principles, the two countries will attempt to reduce interceptions whenever possible and avoid undue disruption of existing fisheries.

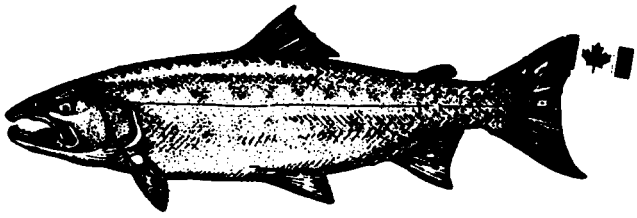
While several regional committees have been working towards improving the availability of catch and escapement data, the International Salmon Unit has been using coded-wire tag (CWT) data to estimate stock interception rates and exploitation patterns of chinook and coho. Tags recovered between 1974 and 1978 have been analyzed, and the most recent three years are being collated. The Unit intends to complete analyses of the 1979 and 1980 returns during 1982 and to prepare a document summarizing 1975 to 1980 exploitation patterns.

In the context of interception balances between the United States and Canada, it is noteworthy that interception estimates prepared by the technical committee on salmon interceptions differ from CWT estimates. CWT estimates of Canadian interceptions of American chinook exceed the technical committee's estimate by 13 percent, but are 28 percent less than the committee's estimate of coho interceptions. On average, between 1975 and 1978, 52 percent and 24 percent of the total Canadian commercial catch of chinook and coho, respectively, were American fish. The magnitude of the discrepancies and catch suggests the need for careful evaluation of present interception balances and their trends.

The preceding figures were for numbers of fish caught; however, interception balancing in the agreement involves weight of fish caught and prices per unit weight. The average size of coho has decreased significantly since the 1950s and, to a lesser extent, this also appears to be occurring in chinook. Rates of decrease per year in length and weight have been estimated from biological sampling data. Coho are estimated to be decreasing in average size at a rate of .13 kg/yr (0.06 lb/yr) since 1951. Chinook estimates by age class are generally less than for coho. Discrepancies exist between rates of decrease estimated by the biological sampling data and catch statistics, with the catch statistic estimates being about 30 percent higher. Length-weight relationships and procedures for reporting landings probably both contribute to this discrepancy, and they are being investigated.

These combined effects of decreasing numbers of interceptions, decreasing weight of catch and decreasing price differentials between sockeye, coho and chinook indicate a weakening Canadian position in the interception balancing, particularly in southern B.C.

Brian Riddell
Head
International Salmon Unit
Pacific Biological Station



Ten years at Carnation Creek

Forestry-fisheries conflicts have regularly made headlines in B.C. for the past 20 years. Many fisheries workers know that the impacts of some forest management practices on fish are serious. However, there has been surprisingly little work done in B.C. to document watershed ecology and the impacts of logging upon it.

In response to these concerns, a multidisciplinary team, including research and management specialists from several federal and provincial agencies and from MacMillan-Bloedel Limited, established a long- term research project to monitor in detail the impacts of logging on a small west coast stream. The project at Carnation Creek, initiated in 1971 and planned to extend through 1985, has operated in a strong spirit of cooperation and mutual interest. The Department, and particularly the Pacific Biological Station, have played lead roles in the study since its inception.

Carnation Creek, the project site, is located on the south side of Barkley Sound near Bamfield. It is in a small watershed, about 10 square km. Although it is a small stream, it freshets violently in the winter storms that sweep in from the Pacific and is not always an easy stream to study.

Some of the principle components of the work involve hydrological studies on all tributaries of the stream, investigations of soil disturbance and revegetation rates, assessment of changes in stream channel form and gravel quality, and studies on stream invertebrates and fish populations. Extensive monitoring, related to all these aspects of watershed ecology, was carried on for five years prior to logging and during six years while logging took place. Logging of about 41 percent of the watershed was completed by June 1981. During the next few years, team members will see how the system continues to respond.

Although it is not possible to provide more than a brief picture of the results, a number of things are beginning to emerge.

A team of fisheries workers sample the stream in one of many population estimates used to monitor numbers of trout, salmon and sculpins.

Even a modest amount of falling and yarding across one section of the stream has produced bank erosion, channel instability and reduction in the volume and stability of in-stream debris. Fish require large and stable debris for winter cover. Some of the impacts are transmitted downstream, where increasing amounts of course sand have settled out over the past three or four years. Egg to fry survival has declined with the addition of extra sand.

However, all aspects of the logging process need not be negative. Opening the canopy along the stream has increased biological productivity within it. After logging, nutrient concentrations increased in the stream. Temperature increases, not severe to date, contribute to greater growth of fish. The study has revealed the importance, for overwintering fish, of small back channels and tributaries. Most people would step over these little channels without noticing them.

Graduate students working on the project have made several valuable contributions. One project has demonstrated the importance of the small estuary for coho rearing. Another study has developed sensitive means of using stream insect complexes (insect relationships) there to indicate changes in the stream. Yet another study is examining the effect of fine suspended sediment on the feeding behavior of young salmon.

It is not intended that the results of the work will rest only in the pages of research journals. Members of the study team give fisheries and forest managers field tours of the project area and explain the results and their implications. In February of 1982, results analysed to date will be presented to a mixed audience of fisheries and habitat protection biologists, and government and industrial foresters. This workshop will attempt to let the managers know how the project is coming and what results it is producing. It will at the same time seek whatever advice managers feel is appropriate to offer at this stage of the study to make it more useful to future fisheries-forestry planning and management.

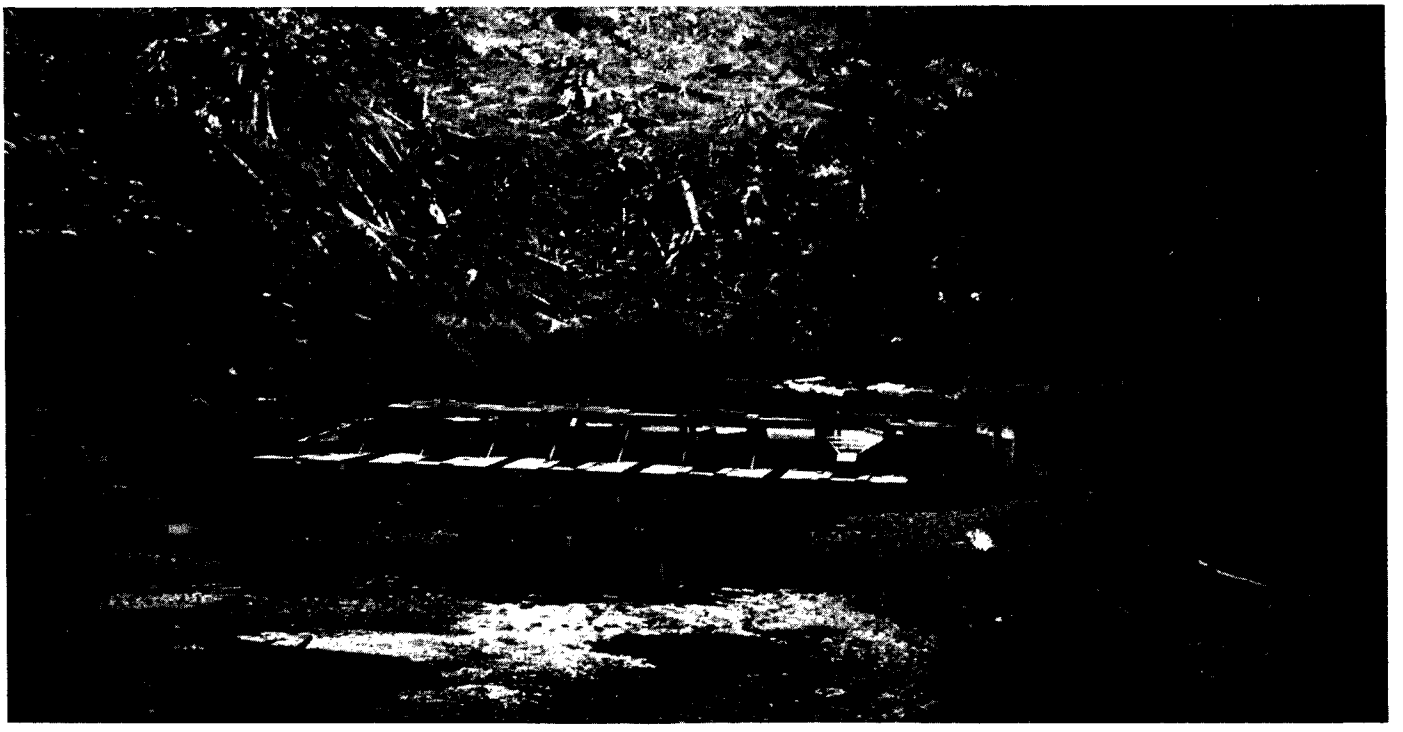
Fisheries and forestry will always have to share watershed resources. We hope that projects like Carnation Creek will contribute to the ecological understanding needed for compatible multiple resource use.

Dr. Gordon Hartman
Salmon Habitat Section
Pacific Biological Station

Carnation Creek Workshop

There will be a three-day review meeting and workshop on the Carnation Creek project, from February 24-26, 1982 at Malaspina College, Nanaimo. Those participating in the study will present two days of background papers on the study. On the last day, a management panel will discuss the papers and the project. They will outline their information needs and discuss the project's role in helping to meet those needs. At the end of the session, there will be a two-hour open discussion. We hope to get advice that will make the last few years of field work and the write-up phase of the project more useful to management.

We are anxious to see fisheries officers and field management staff well represented. For more information and copies of the agenda, contact Dr. Gordon Hartman, Pacific Biological Station, Nanaimo, at 752-5202.



The main fish fence at Carnation Creek.

Introducing the Habitat Branch

An interview with Director-General Wayne Shinners

In late 1981, Pacific Region Director-General Wayne Shinners announced that a Habitat Management Branch would be established, as recommended by the Habitat Revitalization Committee. Many Department staff will be affected as the new branch takes shape in the coming months. Sounder interviewed Wayne to find out more about the new branch.

On the surface, changing the Habitat Management Division to a branch seems like merely an administrative or bureaucratic move. As it turns out, there are some very compelling reasons for this elevation in status.

"It puts the habitat issue where it should be," Wayne explains. "It gives habitat a higher profile within the Department and hopefully with industry as well."

For the first time, Habitat will have a voice on the Senior Executive Committee, the senior decision-making body in the Pacific Region.

At the moment, the Habitat Management Division is still a division. There will not be an acting director appointed, and Wayne says, "Forbes [Boyd] will carry on as head until we can get the director's position described and a competition completed."

The job description is in the process of being written and will be sent to Ottawa for approval by the end of January. Wayne is hoping to obtain an executive [EX] category for the job, since both the deputy and assistant deputy minister support the move to upgrade the division to branch status.

The branch will be established as soon as a branch director can be recruited. "Being realistic, I will be quite happy if we have it done by April 1. I expect a government-wide, cross-Canada competition would be held, and that will take at least two months," Wayne says.

Director-General Wayne Shinners

Within the period of a year, two major sections, Northern Operations and Habitat Management, have been removed from the Field Services Branch. Does this indicate a dismantling of the Field Services Branch?

"No," he says, "but it does pose a logical question of whether, with a senior manager in the north, Field Services Branch is a proper term. Maybe designating it as Southern Operations would be more realistic.

"Moving Eric Kremer in as director of Northern Operations is an experiment to some degree, but it was brought about by the obvious need to bring a senior manager into the north. Northern Operations are significant in regional terms, and to suggest that it be run from Vancouver is not giving it the status it deserves. So we decentralized as much as possible. The director is in Prince Rupert, the management biology group is there, licencing is there now and we are looking at moving some administrative functions to Rupert. We'd like to do everything possible to ensure that decisions pertaining to the north are made in the north, reflecting, of course, the regional and departmental policies."

Wayne feels that the new Habitat Branch director should have some flexibility in how the branch is organized. However, he doesn't see the core group--in effect, the branch--being larger than about a dozen people. "If it's any larger, you retain some sense of centralized responsibility. We want the day-to-day decisions to be made in the field. So, instead of Field Services people moving to the Habitat Branch, it will be the reverse.

"We'd like to do everything possible to ensure that decisions pertaining to the north are made in the north."

"The new Branch, as such, will be relatively small. The core group would provide advice, assistance and special expertise, such as in hydrography. The Habitat field staff located in the field will report to the area managers." In other words, the core group will provide advice and guidance, as opposed to direction.

This system is not new to the organization. Wayne points out that the Inspection Branch operates in a similar way. Inspection staff in the field report to the area manager, and Chuck Campbell's staff at 1090 W. Pender provide guidance to them.

Although the Habitat Revitalization Committee recommended that Habitat Research be moved into the new branch, Wayne has rejected that idea.

"I've been in the Pacific Region for two and a half years now, and during that time, Habitat Research has been in three locations--in Resource Services, Habitat Protection Division, and back in Resource Services. That's one reason I choose to leave them where they are. I'm not convinced that moving them again for administrative purposes is a good enough reason. Besides, I think there is more to be gained if they remain part of the larger research component. I recognize the need for some assistance and guidance to and from operations, but I think that can be done without moving them."

SEP's habitat activities also came under scrutiny from the Revitalization Committee. Whether they become part of the new Branch's responsibilities "is something we are going to have to look at further," Wayne admits. "I haven't pursued this at all with Ward Falkner [executive director of SEP]. I would like to have the branch director on board first before we examine this in depth."

Habitat management and fisheries management are equally complex and specialized. Would there be habitat regional managers at the same level and in the same locations as area managers?

"It's hard to speculate that they would have the same status as area managers," Wayne says, "but I would certainly see the senior habitat person at a significant level, similar to the senior management biologist in each area. We want habitat people to be an integral part of the area manager's staff, working together on a day-to-day basis. Area managers should have their own capabilities in the field to make their own decisions, rather than relying on experts at 1090 W. Pender."

Apart from a core group of about 12, the rest of Habitat staff will be decentralized to field operations. Wayne points out that Don Wilson, director of Field Services Branch, has already decentralized some positions. "For the most part, I would hope to see the transition [decentralization] take place through attrition rather than forcing people to move--within reason,"

"The Department seems to have a shorter-term view than EPS or the Province. If something detrimental is happening to the fish, we have to act now. We can't wait for improvement in 15 years."

Wayne says. He adds that positions become vacant, they will be given to the area managers to fill.

The Habitat Management Division, and the Department have both come under fire for seeming to bargain away fish and habitat. Wayne attributes this impression in large part to the "single window" concept, which was established to provide industry, the public and other federal and provincial government agencies with a single contact agency on environmental issues. The Environmental Protection Service (EPS) has

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been responsible for coordinating the federal government review of many environmental issues (for example, mining and pulp and paper discharges). It is an attempt to have government agencies speak with one voice.

The new branch will not be given any new resources to carry out its new responsibilities of enforcement (to be a division) and restoration and development (also a division). Also, Wayne says that any new resources (budgets, staff), would be directed toward decentralization.

"I'm as unhappy as anyone with the one-window approach," he says. "The Department has a shorter-term view than EPS or the Province. Their time frames are totally unacceptable to us. If something detrimental is happening to the fish, we have to act now. We can't wait for improvement in fifteen years--the resource would be lost.

"I'm looking forward to--not increased enforcement necessarily-- but a more forceful and vigilant application of the Fisheries Act," he says.

How does this approach fit in with what appears to be a new policy of coordinated resource management (CRM)?

"I don't feel that CRM means bargaining away the resource. It means talking to other users, and being aware of their legitimate rights and concerns but in the final analysis, when it comes to trading off fish or fish habitat, we're not in that business," Wayne states.

A policy of no net loss of productive fish habitat sounds admirable, but there are still sticky questions to do with measuring loss, and having a "balance sheet" of habitat losses and gains. Wayne does not support mitigative measures.

"I'm totally opposed to anything that would remove fish habitat from production," he says. "No net loss is a nice phrase, but you get into trade-offs and one hell of a mess, really."

"I get the feeling the Department is always asked to be the fall guy--to give up something with the promise we'll be looked after later. We never get looked at later."

"If the people of B.C. and Canada want to choose forestry or mining or whatever over fish, then I can live with that," he says. "Until then, we should stand up and account for the fish. That's our job."

Maxine Glover
Editor

Letters

To all Fisheries staff:

At the end of January, I will be leaving the Department on an executive exchange to join the Fisheries Association of B.C. Although I have mixed emotions about the change, I am looking forward to the opportunity of approaching resource management from a different viewpoint.

When I was first considering this opportunity, the one negative thought I had was that I would be leaving a damn good organization and group of individuals who have made the time I've spent here a real pleasure. I would therefore like to take this opportunity to thank you all for your support and constructive criticism over the years. This same support has helped provide the opportunity and make my decision possible. I would also hope that through the various advisory panels, committees and meetings, I will be able to assist you in fulfilling our mutual resource management responsibilities. I look forward to maintaining a close relationship with all of you and wish you well in your endeavors.

Garnet Jones
Director
Intergovernmental Affairs

Dear Editors:

Your reply to Bruce Hillaby (Poem in poor taste, page 12, December, 1981) missed the point in my opinion.

The disqualifier (disclaimer?) in the Sounder has no bearing on quality. You, the

continued from page 12

editors, are 100 percent responsible for the quality of the publication you edit. Hillaby is objecting (and I agree) to quality, not to opinion. What was said in the poem can be said in a much nicer way and just as "light-heartedly."

The Sounder has a wider circulation than you think. I have seen it on the reading table in the entrance hall of the station and in our library, both public areas.

Frank Velsen
Pacific Biological Station
Nanaimo, B.C.

What you can expect

Happy New Year to everyone and the best wishes for 1982. I hope everyone included in their New Year's resolution, "to do the paper work the correct way."

I didn't get my December column written because of the annual meeting (where did 1981 go?), so I'll try to cover all in this column.

The clerk-secretaries' meeting at the Field Services Branch went very well. We were all pleased with the various presentations. Would the people who were going to find out further information for the field clerks please get it to me as soon as possible so I can complete my report?

Again, I wish to thank everyone who attended and spoke; your participation was greatly appreciated and in most cases very helpful.

My good friend and co-worker at one time, Marjorie Heap retired at the end of December. Marjorie and I go back a long time; she first came to the Department in 1967 at Victoria. Victoria was then a subdistrict of District Three. We have kept up our friendship through these many years and I will miss her and our many chuckles very much. For you, Marjorie, happiness is retiring and driving a new car.

Budgets, old and new, are always a prime concern. Everyone concerned should be closely checking their FACS (Financial Allotment Control System) print-outs every month; removing any commitments that no longer exist, but that still show up on the report. A good example is an "agency contract" that has a balance showing in the commitment section. If the final invoice for the contract did not show the information that it is a final invoice, then any balance is not closed until requested. Any individual agency contract requisition is good for only the requirement it was issued for. If you have a commitment showing on the FACS print-out, covering a purchase requisition you have submitted, but the items are not available, a requisition must be written to cancel or amend the original requisition.

Also, the monthly "detail transaction" sheets should be checked to ensure that the financial codings have been charged correctly. It would certainly assist the payment of invoices and proper coding charges if the coding figures were always made legible and clear. What a frustrating problem it must be to try to decipher signatures and guess at numbers.

There is a summary allotment code sheet with your FACS printouts which gives you an overall picture of your budget. These are distributed from regional headquarters to the line managers and any budget details should always be discussed with your own supervisor.

Many fishery officers are now using the "extra-duty pay and shiftwork" form for overtime. Hopefully this will help in paying overtime more efficiently, but only if the forms are submitted on time. That is, they are to be received in Personnel the first week after the last pay cheque. For example, certified overtime for the month of January should be in Personnel by February 5, but no later than February 8, 1982. If it is received on February 9, then it will not be processed until the next overtime period, which would be March. Good luck, everyone.

Pat Phillips
Co-ordinator
Administrative Services
Decentralization Projects

Spurious emissions

There have been many staff changes in Habitat Management Division. John Mathers, section head, construction and transportation, Land Use Unit, left the Department on January 8, 1982 for a new position in charge of the Liard River environmental studies for B.C. Hydro. Donna Lee, clerk/ secretary in the West Van Lab, transferred to 1090 West Pender to become divisional secretary with Habitat Management Division on January 5, 1982. Kristina Recalma, a new employee in the Department, started on January 12, 1982 as clerk/ secretary in the Cypress Lab, West Vancouver. She was previously employed as a clerk/typist with Cheeseman & Company Appraisals Inc. Jay Hammond was taken on as a new biologist with the Department on January 4, 1982. He will be assisting the Land Use Unit with referrals and working out of New Westminster. Jay worked for B.C. Research for 18 months before joining the Department. Betty Hillaby, a biologist with Water Quality Unit, has won a competition for a biologist's position in the Habitat Management Research Group, West Vancouver. She started her new position January 4, 1982. Congratulations, Betty.

* *

Staff changes in SEP Engineering include: Mike McMahon, who joined the Department as a draftsperson, and Ed Woo, who joined the Department as an engineer. Giorgio Caon, engineer, has left the Department.

* *

Dave Schutz has left his secondment to Regional Planning, Vancouver, to resume his duties as senior biologist, South Coast Division, in the Nanaimo office.

* *

Suzanne Chamberlain (nee Hampson) staffing officer, Personnel, has left the Department to take up her new duties as staffing officer with the Employment and Immigration Commission in Vancouver.

* *

Joining Offshore Division as a Program Officer is Susan Diamond.

Sandy Fraser, economist, SEP Planning, left the Department in December to join the provincial Department of Industry and Small Business, in Victoria. Another person who has left the Department to join the provincial government is Trevor Proverbs, former head of Special Programs and Management Support Unit, Offshore Division. Trevor has joined the Marine Resources Branch in Victoria.

* *

Three well-known employees who retired in December 1981 after many years of service were: Marjorie Heap, district clerk, New Westminster; Margaret Walker, supervisor, Statistics Collection and Processing Unit; and Olive Boyd, Head, Accounts Payable.

The angelfish is watching over Olive Boyd as she cuts into cake at her retirement party. Sharon Henderson, acting chief of Computer Services Division, stands behind.

Sheila La Flamme, formerly with Offshore Division, has won a competition for the position of secretary to the director-general, Wayne Shinners, and his Executive Assistant, Lorraine Jung.

Joining Support Services Branch as a Financial Information Officer is Joe Choo-Foo who formerly worked for the Department of Indian and Northern Affairs in Vancouver.

* *

Leaving the Department on a two-year executive interchange is Garnet Jones, director, Intergovernmental Affairs, who joins the Fisheries Association of B.C. as its president. Sharpen up your negotiating tools, Garnet!

* *

Fishery Officer moves and promotions include: Ziggie Kriegel from Prince Rupert to Chilliwack effective January 15; Michael Orrey from Campbell River to Alert Bay, effective October 29, 1981; Brian Spilstead from Queen Charlotte City to Butedale subdistrict; Gordon Curry from Sooke to Kitimat; Greg Klimes from Dawson's Landing to Pender Harbor; and Robert Martinolich from Bella Bella to Coquitlam subdistrict.

* *

The Fisheries Staff Christmas party held in Vancouver was once again a terrific success - those who didn't go missed a great time! Thanks to Judy Glenn, Elaine Corrie and Pam MacKenzie for all their hard work. Ed Zyblut proved himself to be a credible and amorous Santa!

Marriages in the Department include: Darlene Sussbauer, biotechnician, Prince Rupert, married to Peter Hogan on December 12 in Prince Rupert (Darlene becomes a member of a third generation Prince Rupert fishing family) and Michelle Pedneault, secretary to Water Quality Unit, Habitat Management. Michelle travelled back east over the festive season to be with her family and marry Joe Ivankovich on December 31. Congratulations to both Darlene and Michelle.

* *

Recent births include a daughter, Kitty, born December 11, 1981, weighing 6 lb. 3 oz. (2.8 kg) to Hyer and Ken Sun, SEP engineering; a son, Darren, born December 25, 1981, weighing 7 lb. 3 oz. (3.3 kg), to Linda and John Patterson, Habitat Management Division; and a son born December 19, 1981, weighing 8 lb. 4 oz. (3.7 kg), to Dawn and Robert Melvin, fishery officer, Comox.

* *

Fifteen staff from 1090 W. Pender enjoyed a cross-country ski excursion to Manning Park on January 16. Another trip, to Whistler via the B.C. Rail "Budd car," is planned for February 13. This is the best way to avoid the traffic and enjoy the day. Anyone interested should call the Sounder at 687-1442. The train leaves North Vancouver at 7:30 a.m.

* *

Photo contest yields 12 winners

Quality was the byword as judges for the 1981 Sounder Photo Contest gathered in early December to select 12 winners, three in each of four categories. Photographers Dick Harvey, Diane Paxton and Terry VanderSar presided over nearly fifty entries for three hours before coming up with the best, and even then the scores were very close.

First prize winners are: Brian Spilstead, fishery officer, Butedale subdistrict (Human Interest); Brenda Nicoll, acting program officer, Offshore Division. (Fish and Fishing); Sam McIntyre, clerk, Queen Charlotte City (Scenic); and Randy Nelson, fishery officer, Terrace (Humor).

Running a very close second are: Greg Bonnell, biotechnician, PIP (Fish and fishing); Randy Nelson (Scenic); Greg Klimes, fishery officer, Pender Harbor (Human Interest); and Dean Nelson, (Humor).

Third prizes go to: Lyle Reid, Inspection (Fish and fishing); Bill Schouwenburg, senior planning biologist, SEP (Scenic); Greg Bonnell (Human Interest); and Greg Bonnell (Humor).

Deserving honorable mention for their entries are Mike Brownlee, Habitat Management biologist (Humor) and Don Lawseth, manager, Robertson Creek

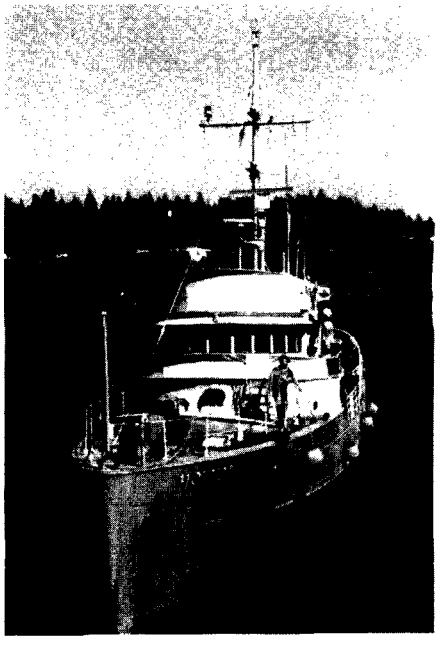
Contest...

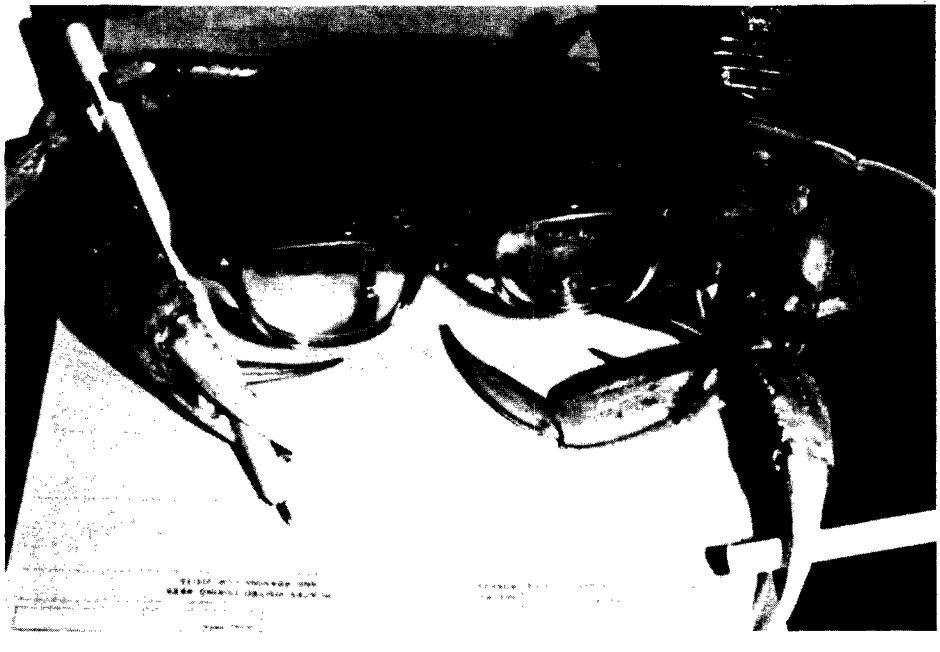
hatchery (Scenic). The quality of most of the photographs was excellent, making the judges' decisions very difficult. Among the criteria that won points were the photo's value in Department publications, its technical quality, subject matter, uniqueness and (for the humor category) ability to make the judges break up in uncontrollable laughter. This latter criterion was certainly a factor when Randy Nelson's photo, entitled "Bella Bella fishery officer" was set upon the table. One judge had earlier commented that he expected people would be submitting pictures of their dogs in straw hats, but no one expected a dungeness fishery officer peering at them across a desk. Next year we'll have a special category called "variations on the theme of dogs in straw hats and crabs disguised as fishery officers."

I thank all those people who participated for making it a worthwhile and fun contest. This year's contest will be held in the summer to give people a chance to bring their instamatics out of the closet. That way, semi-pros' like Greg Bonnell, who won three prizes, won't find it such a snap.

Mike Youds
Editor

Beauty, humor and nostalgia were some of the merits that won these photos prizes in the Sounder photo contest. At right: black and white reproduction does not give full justice to Lyle Reid's photo of Fraser River commercial boats. Bottom right: Randy Nelson's "Bella Bella fishery officer" doesn't seem to realize that smoking causes cancer. Below: of all the photos taken of the retired "FPV Howay", Brian Spilstead's wind-lapped, rust-encrusted rendering must be one of the best.





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10th anniversary issue
see pages 12 to 16

Campbell River

The angler's mecca and beyond

When nonresidents talk of salmon fishing in British Columbia, they usually mention, in the same breath, Campbell River, the angler's mecca. But for the Department staff of district five, Campbell River district, their boundaries encompass much, much more, and a review of their activities underlines this fact.

"Our first priority is commercial fishing and our second priority is habitat," says Rick Marken, one of three fishery officers in the Quathiaski Cove subdistrict. "Sportfishing is a third priority" adds District Supervisor Norm Lemmen, "because it has the least potential for damaging stocks."

Until last year, Rick spent a good deal of his time monitoring the sport fishery, but this has changed because of limited staff resources and the pressing demands of the other priorities, he says. On page six of this issue, Fishery Officer Jack Trent explains the intensity of the sport fleet.

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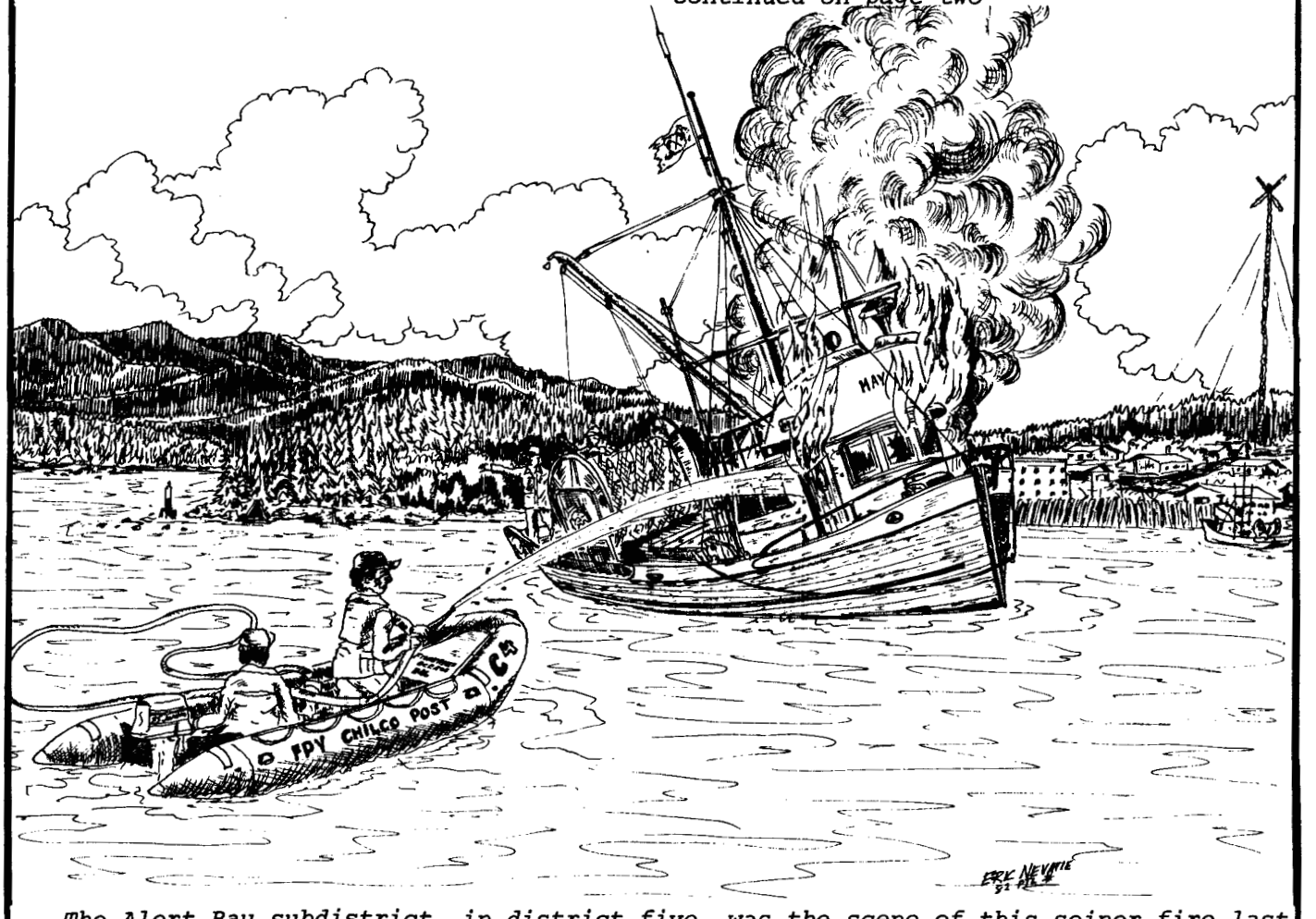

The Alert Bay subdistrict, in district five, was the scene of this seiner fire last summer. Illustration is by Eric Nevatie , a seaman aboard the "FPV Chilco Post."

Campbell River
Angler's mecca...

The district's sport fishery is large enough to cause worry about its movement into areas closed to the commercial fishery. A factor in this concern is the seriousness of declining chinook stocks expressed in 1981 escapement estimates; for the first time, routine inspections found no chinook in three district rivers.

The shortage of traditional sport-caught species has led to increasing sport catches of pink and sockeye, a development that Norm believes cannot be ignored.

"With the new highway to northern Vancouver Island, the recreational fishery is moving in in a big way," he says.

Campbell River district is far more than just a favorite sportfishing ground. Stretching from Cape Scott in the north to Campbell River in the south, and including the deeply indented mainland coast, the district covers an area of 103,650 square kilometres. In 1981, it realized its largest commercial catch ever, amounting to over seven million salmon with a landed value of $60 - $70 million. The bulk of that catch, 6.8 million, was caught in the Johnstone Strait interception fishery, in what is referred to as the "main gut," from the top of Area 12 down to Area 13. The controversial Strait fishery has become a whipping boy for many of the problems faced by the Pacific salmon resource.

"When I first arrived here three or four years ago," Norm says, "I had a preconceived notion of the Johnstone Strait fishery. I had seen the weakened stocks passing through the Gulf of Georgia. But since I've been here, I've realized that the interception fishery is not entirely to blame. The answer to our stock problem is in the rationalization of the fleet in the Straits and resolving other problems faced by the resources. We can't just

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Sounder
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Contents

Joint project in Campbell estuary

Fishery Officer Rick Marken overlooks the Campbell River estuary, once the booming ground for Elk River Timber Company. When Elk River was acquired by B.C. Forest Products in 1980, plans were made to establish a dryland sort upstream. One of the conditions laid down by Habitat Management for approval of the new development was the restoration of the estuary as natural estuarine habitat. The $300,000 restoration job will be completed this March.

deal with that fishery alone. There are positive reasons for maintaining that fishery."

On page five, Assistant District Supervisor Ray Scheck provides a summary of the Johnstone Strait fishery, its advantages and disadvantages; Fishery Officer Bruce McDonald provides a summary of a unique management technique on page five; on page nine , Fishery Officer Jack Trent summarizes the herring bait fishery, a relatively small but troublesome fishery.

At season's end most of the coastal seine fleet converges on Campbell River to have one last try at chum returning to the Fraser River. The chum fishery is evolving into something of a social event for the fleet, Norm says.

"It's kind of exciting when you have that many boats (500 seiners and as many as 1,000 gilnetters) in the area with limited resources to handle them. It can become quite intense for fishermen and for our officers. We've come pretty close to confrontation in the last few years, with meetings where they threaten to go fishing (in spite of closures), but common sense always prevails."

Farther north, the Port Hardy subdistrict in Area 11 is staffed by Officers Dave Hahn and Dick Tritschler. Home to a large troll fleet, Port Hardy also serves as a take-off point for all offshore and northbound boats.

Shellfish populations in the district are under greater pressure as the salmon fishery becomes more restricted. Many local fishing guides include oyster gathering as part of their packages. Commercially, the district's prawn fishery is the largest on the coast and between 5,000 and 6,000 kg of abalone are taken each year. Total are closures are often necessary for conservation of prawns and groundfish.

Habitat, the district's second priority, demands about 60 percent of staff time. Numerous forestry and mining operations spread throughout the district's remote areas and urban growth within the immediate Campbell River area are the activities demanding most attention. The river itself is a thriving example of multiple resource use, with the community, companies and government struggling to assert their interests in the river and its watershed.

The importance and fragility of the Campbell-Quinsam River system cannot be overstated, Norm says. On page ten, Wayne Knapp of Habitat Management's Water Quality Unit summarizes the circumstances of two highly controversial mining developments, Quinsam Coal and Westmin Resources. Although Quinsam Coal remains in the planning stages, many residents are outraged by the very idea of a stripmine in the watershed.

"Those rivers are worth a

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tremendous amount to Campbell River," Norm explains. "The Chamber of Commerce estimates $25 million a year. Most of that comes from sport anglers who are attracted by the large chinooks. Both the coal development and Westmin have the potential of damaging or eliminating that resource."

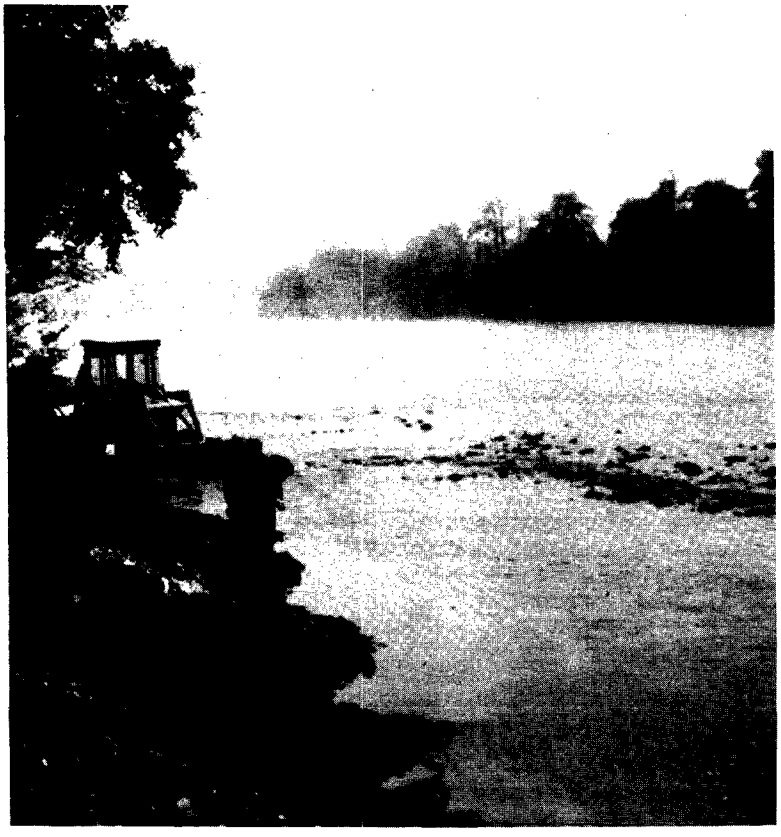
Staff are fortunate in that they have in the district a community that is deeply concerned about the welfare of the resource. This concern is often expressed by the more vocal vested interests, but is shared, with differences of opinion, by a great many others. As Rick Marken explains, most people in Campbell River did not object to the initial 1981 sport regulations, as did those with vested interests, but only to the subsequent watering down of the regulations. Rob Bell-Irving, a local fishing guide and newspaper columnist, suggests that a two-fish-per day limit would be widely accepted by the sportfish fraternity. But he questions the recent sport pursuit of pink and sockeye, saying, "I haven't caught a single one in 15 years."

The community's regard for salmonids is borne out in the number of interest groups formed to protect or enhance the salmonid resource and of SEP volunteer projects, scores of them. Among the most ambitious of these were two jobs performed by Department auxiliary staff last year, as reported on page eight. There is also the Campbell River Sportfish Advisory Committee, a group of concerned citizens who regularly meet with Fisheries staff to discuss the resource and community concerns about it. Although not an official body, the board acts as an effective community liaison for the district five office; an essential job in an area so dependent on fisheries.

Mike Youds
Sounder Editor

Streamside vegetation recognized

The backhoe operator was unaware of any wrongdoing in this blatant case of stream disturbance. Another, more recent case on Willow Creek, near Campbell River, resulted in a precedent-setting court decision. A landowner had cut down a stand of alder bordering the creek. In the decision, the trees were considered an important part of fish habitat, a fact never before recognized in court.



Johnstone Strait fishery: boon or bane?

The commercial fishery in district five is usually referred to as the Johnstone Strait fishery and includes all of Areas 11, 12, and 13. Actually, the Johnstone Strait fishery, stretching from Blinkhorn Light to Chatham Point, represents only a small portion of the fisheries in the district. Below Chatham Point, through to the Strait of Georgia, is the area used by the largest sport-fishing fleet on the B.C. coast.

Although the management strategies of the commercial fishery appear complicated and confusing, the results have been excellent. In the past decade, the Johnstone Strait fishery has provided a total catch of 12,415,123 Fraser River sockeye for commercial fishermen of B.C. Had the Johnstone Strait fishery been eliminated years ago, as suggested by many, fifty percent of the above catch would have gone to the U.S. fishermen under the IPSFC treaty.

In 1981, because of the above average diversion rate of Fraser River sockeye, district five took in excess of 7,000,000 fish, one of the largest catches on record.

However, since the fishery held in Johnstone Strait is a mixed stock fishery, there are some serious management problems. Strong runs of Fraser River sockeye are usually fished at the expense of weaker stocks of Gulf pink and chinook. Good quality silver-bright Qualicum chum can only be harvested at the expense of weaker and later Fraser fish stocks.

Johnstone Strait is usually the last area open for commercial fishing. It is not unusual to have every seine boat on the west coast in Johnstone Strait. In 1980, in the late chum fishery, 520 seine and more than 1,000 gillnets were in the Strait for a one-day fishery. Less than 60 percent delivered fish.

In view of these management difficulties, should we eliminate the Johnstone Strait fishery? The social impact would be great; fishing is a way of life for fishermen living at Alert Bay, Sointula, Kingcome Village and Port Hardy. Phasing out the Johnstone Strait fishery would hurt the livelihood of these communities.

Ray Scheck
Assistant District Supervisor
Campbell River District

Fishery huddles provide insight and feedback

Close consultation with fishermen, an effective fisheries management technique, was employed in the Campbell River district during the 1981 salmon season. Each week, following the weekly closure, all interested fishermen were invited to visit local subdistrict offices and meet with the local fishery officers and patrol boat skippers. The purpose of the meetings was to discuss the fishery just completed and to plan fishing patterns and timing for the following week. This forum was also used to discuss regulatory changes and enforcement policies. Campbell River district staff alternated between Campbell River, Port Hardy and Alert Bay to assist with these meetings every second week.

The response to these meetings was excellent in Alert Bay. Our local commercial salmon fishermen provided us with an excellent sounding board for our proposals and plans. On several occasions, in response to their suggestions, we were able to alter boundaries successfully, providing more fishing

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area at the same time as effectively protecting weak salmon stocks during the heaviest part of the sockeye run.

Local fishermen have a great deal of valuable knowledge to share that is valid in weekly fisheries management. We soon found that individuals were prepared to offer up for sacrifice their favorite tie-up spots in the interest of protecting particular passing stocks. Of course, this sometimes allowed for more fishing time in some other areas on the predominant sockeye run.

A spirit of increased trust and cooperation blossomed on both sides, so that even those fishermen who disagreed with points of our proposed policies and plans felt much better having heard the management rationale presented firsthand. Fishermen attending the meetings spread news of the meetings to the rest of the fleet, and much greater understanding and cooperation was achieved with the fleet as a whole. These communications activities took some extra time to carry out, but the return on the time invested far outweighed the sacrifice involved.

Bruce McDonald
Fishery Officer
Alert Bay Subdistrict

Campbell River's endangered legacy

Tidal water sport fishing around Campbell River is world famous and has been since the 1800s. One can read of a two-week sport fishing trip where a person landed over 1.8 tonnes of salmon with 106 salmon weighing more than 14 kg (30 pounds). In the name of sport, they were all landed aboard a rowboat. Since that time, sport fishing activity has increased. Today during peak periods, it is common to count over 1,000 sport boats in the area off Quadra Island. These vast numbers, plus mobility of the fleet, make statistics gathering very trying; it is next to impossible to obtain hail figures. Mobility and larger boat size allow the sport fishing family to board their pleasure craft, pets and all, head out for a day's fishing and in less than a few hours be 40 km from home.

From 1947 to 1978, Area 13 waters were patrolled by seven charter vessels, one fisheries patrol vessel plus a small speedboat. Today, these same tasks are expected to be carried out by four charter vessels, one fisheries patrol vessel, plus that same small speedboat. With the increase in sportfishing activities and areas, it is no wonder the public complains about never seeing the fishery officer; he or she is lost in the crowd, doing 15 km/h while the fleet is doing 40 km/h. Also, the sport

anglers are not governed by hours of work or limited overtime; they fish around the clock, seven days a week. They are equipped with sounders, radar, radio, telephones and every other gadget available to make catching fish easier. They are not Huck Finn smoking a corncob pipe in a rowboat; many are sitting in their yachts and sipping scotch.

Guiding in the Campbell River area dates back to 1903, when the Willows Hotel supplied guides and boats to its guests. Guides in the area today may number as many as 200. They operate from resorts, private homes or hotels.

Campbell River

Depending on location, season, and the guide's experience, you can expect to pay $25 per hour for this service. For this fee, the guide is expected to venture out in any weather and to produce fish for the weekend angler who just flew in from Calgary.

Campbell River is not the only place you find sport anglers; in Area 13 they can be found wherever there is enough water to cover a hook. Stuart Island is another well known hot spot. Three times a week this small island population changes. The wharf in Big Bay looks like an international airport; four or five aircraft line up, and there may be one with Canadian registration. These visitors are here to catch chinook salmon, and 85 guides are waiting to serve them. This area's sport fishing has developed over the years since the early 1950s. Today, the wharf is replaced by flatbottom boats, containing guide and patrons, all swirling around in the eddies, concentrating on chinook salmon and willing to fill their bag limits with coho or pinks. Around the corner, you can find tied to the wharf several yachts all stopping off for a few days of fishing before heading northward; some even stay all summer.

Area 13 is also blessed with a terminal sport fishery in several of the inlets, including Bute, Loughborough, and Phillips Arm. Ramsey Arm used to be included, but due to the lack of fish returning to the Quatam River it is no longer a popular spot. Sport fishing in these inlets dates back several years. From 1951 to 1967, sport anglers required a licence to fish Phillips Arm. Yet concerns arose for fish stocks and closure and limits were recommended.

Today, fishing pressure in Phillips Arm is limited, not due to the lack of participants, but because of declining numbers of fish. The Department has been procrastinating about the problem of wild chinook for decades, yet the decline continues and so does the procrastinating. I agree that to close down an inlet to all fishing is not striking the problem at the suspected source, but it is a first aid measure that can be taken, and it will help until such time as measures further afield can be implemented. Sport fishing in Area 13 is big business; if it is to continue, steps have to be taken, and damn soon. The clock of life in the chinook salmon is wound, but man cannot restart it when it stops.

Sport angler "boating" a small chinook off Copper Bluffs, near Campbell River. The Campbell produces about 20 percent of the sport-caught fish in B.C. waters.

Jack Trent
Fishery Officer
Quathiaski Subdistrict

Perhaps the old proverb, "penny wise but pound foolish," should be adjusted upward to allow for inflation. Last month, Fishery Officer Jack Trent received a cheque from the Government of Canada to reimburse him for travel expenses. The cheque amounted to five cents. Now, we can't figure out where Jack could have travelled for five cents. Pay toilets are not a legitimate travel expense. In any case, Jack, don't let this windfall go to your head.

Campbell River

Combined efforts clear creeks

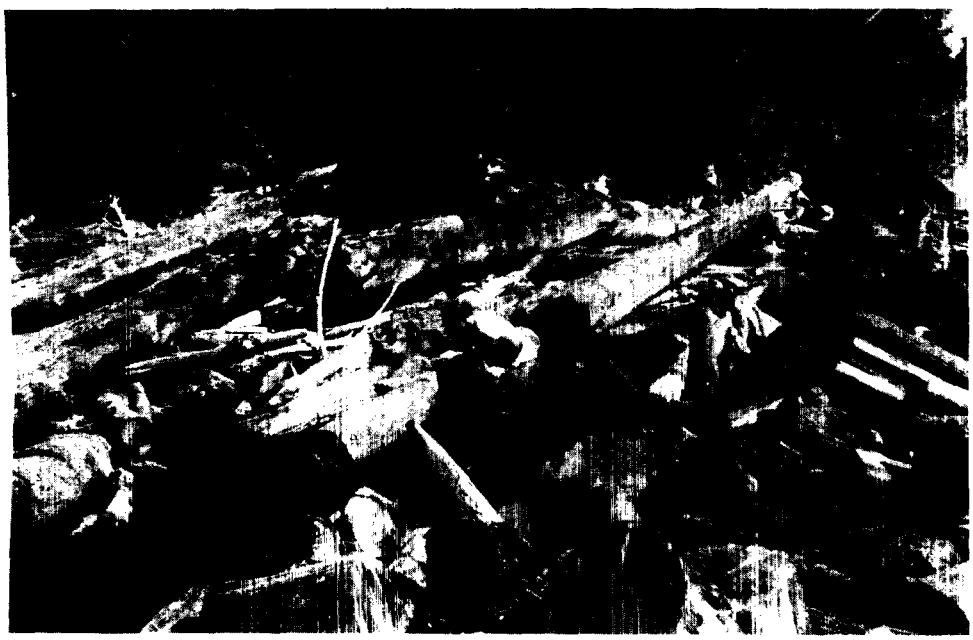
The B.C. coast is filled with short streams that tumble steeply down the sides of the Coast Mountains and into the saltchuck. Despite their sharp drops and susceptability to slides and flash floods, these creeks can provide productive fish habitat. Two such creeks in district five are on their way to recovery as a result of hard work by volunteers and auxiliary staff in the area.

The first, Scott Cove Creek, was cleared in the summer of 1980 after being blocked for over sixty years. By opening up the Creek, the clearing also provided access for fish to three other watersheds. Six chartered patrolmen, the son of one patrolman, and two Area 12 fishery officers joined forces with three local logger/fishermen and a skidder in a three-day operation. They set about removing a log crib dam and three major logjams left along the creek since 1918, when a small logging company attempted to log the area. An attempt in 1979 to remove the jams as part of a log salvage operation failed because the number of spikes made the wood unmarketable. Funds made available through SEP encouraged the second attempt. This effort paid off when, in the fall, an estimated 200 coho and 25 chum went up Scott Cove Creek to Loose Lake and spawned in its feeder streams.

The second project involved a logjam in Charles Creek, on Kingcome Inlet. The creek originally supported an escapement of 15,000 chum and 3,500 pink, and a cannery was built at its mouth in 1906. A fire and a major rockslide ended the cannery operation in the early 1930s. In 1951, a large tree fell into the creek and completely blocked fish access. A local trapper, logger and fisherman, Bill Proctor, brought the logjam to the attention of Patrolman Bill MacLeod, who obtained SEP funds to clear the creek. Several attempts were made to remove the jam during the fall of 1980, but water levels were too high and the project was postponed until October, 1981. At that time, Bill Proctor, crew members of the "Chilco Post," Fishery Officer Mike Orry and two citizens of Sechelt, Pat Mullen and Harold Swanson, dynamited the jam.

Local inhabitants in the area of both Charles Creek and Scott Cove Creek have expressed interest in operating incubation boxes to help rebuild the stocks in the creeks.

Mike Youds
with district reports



Patrolmen Rene Roh and Mark Zuidema lift pieces of log out of Scott Cove Creek. The creek is on Gilford Island, about 40 km northeast of Alert Bay.

Best bait is bad news for chinook

Have you ever considered the viability of sport bait ponds? In a small annual fishery, herring are seined and towed to a marina where they're kept in ponds as live bait. In some areas it is a fast growing practice; but the use of fresh bait to catch salmon and cod is having a marked influence on the decline of chinook stocks.

In 1981, we issued permits for only 163 tonnes of sport bait ponded herring for Area 13, having considered the exploitation of immature herring and the resulting sharp increase in the ability to catch chinook salmon. Depending on the area fished and the angler's experience, the catch rate can reach as high as eight chinook per dozen herring used, or an average of one chinook salmon per dozen herring used. Is the exploitation of mixed herring stocks and the increased potential of increased chinook landings worth the monetary gain from the sale of bait herring?

Several methods, with varying degrees of success, are used to obtain fresh bait: small dip-nets, herring rakes and seines. The use of fresh bait enables the angler to select the size and type of bait salmon are feeding on at that time. Anglers, in a lot of cases, have more money than time, and they rely on someone else to catch their bait. This creates a demand on resorts and marinas to provide fresh herring for their clientele.

This demand, plus attractive profits, brought about some very disgusting conditions in 1980. Inexperienced operators were everywhere, making sets in areas frequented by salmon, making excessive sets, crowding ponds, and moving herring too fast or too far. As a result some of the ponds were later in such a vile condition that seagulls were detouring from the smell of dead, rotting herring.

These and other conditions led to the development of guidelines for bait ponds and handling live herring. The purpose was to control the exploitation without creating a limited entry fishery. Since the herring are bound for sale and resale, the catch vessel would have to be commercially licenced. In order to reduce mortality and make better use of the herring resources, restrictions were developed: limited mesh size to prevent snagged gills; knotless web to prevent scaling; and a limited distance of transport (this latter responsibility was to rest with the subdistrict officer, who would be expected to be most familiar with the tide and current rates and areas frequented by immature salmon).

When herring are towed in a seine through areas of high current a high mortality results. The tank or barge method lends itself readily to moving greater distances, but again, it is not without problems. In rough weather, the excessive movement causes scaling and consequent mortalities. The 1981 season saw a sharp increase in proper handling, but again it was not without failures, most of which can be put down to trying to transport herring with improper equipment and inexperience.

The catch vessels are required, under Section 48 of the Fisheries Act, to report their landings and sales. A condition of the pond permit is to maintain a daily sales log and mortality record. From these records, we hoped to estimate total exploitation. In the past, we have been dependent on estimated tonnage. Observations show that bait herring weights vary from one dozen per pound to two or three dozen per pound, all being sold at $3 per dozen. By comparison, roe herring may have only three or four herring per pound. When one considers the price paid per dozen of ponded sport bait herring, it is realistic to see that a ton would sell for upwards of $6,000 whereas roe, food and other bait herring sell for much less.

Jack Trent
Fishery Officer
Quathiaski Subdistrict

Campbell River

Westmin faces Buttle Lake charges

Westmin Resources Limited currently operates an 875 tonnes per day copper-lead-zinc mine and mill complex at the south end of Buttle lake on Vancouver Island and proposes to increase production to 2700 tonnes per day. Since 1967, when the mine commenced production, a portion of the mill tailings has been discharged directly into Buttle Lake under authorization of a provincial pollution control permit. Mine waters are also authorized to be discharged, after treatment, to Myra and Thelwood Creeks, tributaries of Buttle Lake.

In 1980, the provincial Waste Management Branch of the Ministry of the Environment released a report which showed that, over the years since the mine opened, heavy metal levels (particularly zinc) have increased in the waters of Buttle Lake. Subsequent data collected by the Quinsam River hatchery staff suggest that zinc levels in the lower Campbell River, which is fed by Buttle Lake, have also increased. As a result of these findings and Department responsibilities for the protection of the extremely valuable lower Campbell River salmon populations, four charges were laid against Western Mines under section 33.2 of the Fisheries Act. This section pertains to the discharge of deleterious substances into waters frequented by fish. The charges will be heard in court in mid-March.

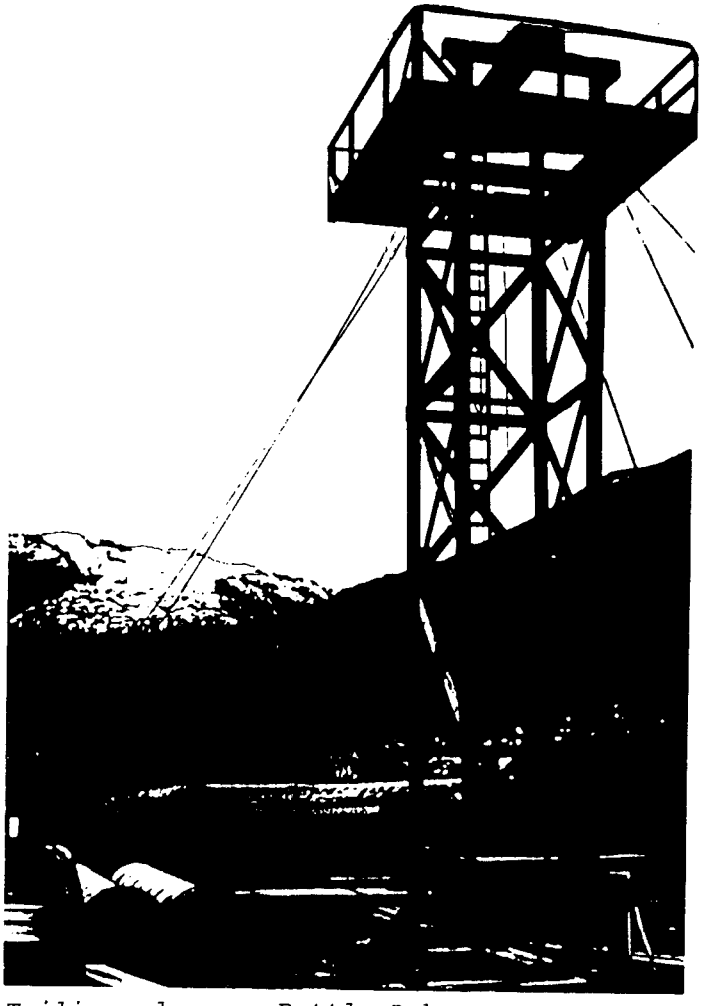
In addition to prosecutions under the Fisheries Act, federal (Department of the Environment and Fisheries and Oceans) and provincial agencies have held several meetings with Westmin Resources to discuss programs necessary to correct the situation. To date, these programs have included:

- initiation of a pilot study to determine the feasibility of depositing mine tailings on land;

- completion of Phase I of a monitoring study to identify mine and surface drainage waters which may be contributing dissolved metals to Buttle Lake;

- initiation of Phase II of this study directed at determining metal loading to Buttle Lake from creeks in the area, from groundwater, and from tailings accumulations in the lake;

- implementation of remedial measures to direct uncontaminated waters around the mine site.



Tailings dump on Buttle Lake.

While metal levels will no doubt continue to be elevated in Buttle Lake for some time to come, it is anticipated that the remedial measures proposed will eventually result in a significant reduction in the overall heavy metal loading to the lake. The Department

will continue to be involved in future discussions with the Department of Environment, provincial agencies and Westmin Resources in order to ensure that progress continues.

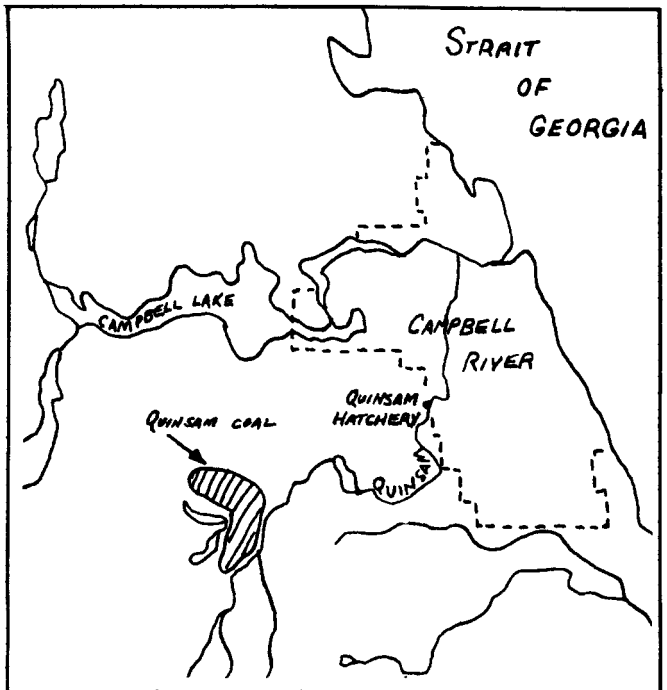
Wayne Knapp
Water Quality Unit
Habitat Management Branch

Quinsam Coal: round two

Quinsam Coal, a joint venture of Brinco Mining Limited and Weldwood of Canada Limited, proposes to develop a one million tonne per year thermal coal mine in the Middle Quinsam Lake area, 27 km inland from Campbell River on Vancouver Island. The coal will be mined, using open pit methods, washed, and transported to the Middle Bay area, where it will be loaded onto barges and shipped to a major coal terminal near Vancouver.

The Department has been actively involved in reviewing the project proposal in order to ensure the protection of the fishery resources of the Quinsam River. The Quinsam River is an extremely valuable salmon producer, contributing natural populations of all five species of salmon as well as sea-run trout to the Campbell River system. In addition, it supports the Quinsam River hatchery, which was built in 1974 to increase salmon and sea-run trout populations. A very successful coho fry transplant program in the area immediately adjacent to the proposed mine site contributes to the concern to maintain present water quality throughout the Quinsam River system.

In May, 1981, following a critical review of the Quinsam Coal Limited, Stage II report (Detailed Environmental Assessment), the federal regional screening and coordinating committee's (RSCC) Quinsam Coal task force, of which the Department is a participant, recommended that the report be rejected pending additional information on such issues as acid generation, groundwater movement, adequacy of wastewater treatment facilities, port development impacts, and monitoring program design.



Map showing location of proposed coal mine in relation to hatchery and Campbell River.

Several subcommittees, set up jointly by the federal and provincial governments and Quinsam Coal Limited, will guide and review these studies. Results of the studies will be submitted to various government agencies as addenda to Stage II. According to Quinsam Coal, "The first volume of results, which will cover the environmental impact of the trucking route and the barging site at Middle Bay, will be ready after the first quarter of 1982. The second volume will cover environmental issues at the mine site itself and should be ready by mid-year."

Wayne Knapp
Water Quality Unit
Habitat Management Branch

What ever happened to the NOB News?

Here it is, warts and all: a recap of Sounder's 10 years.

For the benefit of those who were elsewhere 10 years ago, Sounder had two short lived forerunners.

The first was The Fishing Line, published by the Fisheries Staff Association and edited by Joe Arsenault. We had to jog a few memories of some long-time Departmental staff for the date of this one-shot publication, because it carried no dateline. (It came out in 1972.)

The Fishing Line

VANCOUVER, B.C.

PUBLISHED BY THE FISHERIES STAFF ASSOCIATION

The four-page news sheet carried a feature story on Andy Murray, who had recently passed away; an announcement of a Department picnic; a recipe for crab meat salad cups; and stories on hydraulics technicians and the protection of spawning beds from pollution in the Tsolum River.

The president of the Fisheries Staff Association then was Steve Zablosky; the vice-president was Maureen Dunbar. The staff association eventually folded as the Department changed.

Where were you?

The NOB (for Northern Operations Branch) News came next and made its debut in March, 1972. The newsletter was the brainchild of Al Wood, now DFO Pacific Region's director of planning. The Northern Operations Branch, then headed by Ron MacLeod, now director general of Pacific and Freshwater Fisheries, provided funds for the newsletter.

It was a modest effort; a collection of photocopied pages fastened by a staple. As for content, it consisted mainly of newsclippings from the local dailies, community newspapers, trade journals and newsletters, as well as articles written by Departmental staff. It was edited by Maxine (Haugen) Glover and put out monthly by the Fisheries Service, Department of Environment.

In addition to circulation in the 1090 building, the newsletter was sent afield to staff in Northern districts and subdistricts. Some SOB (Southern Operations Branch, that is) people also received it.

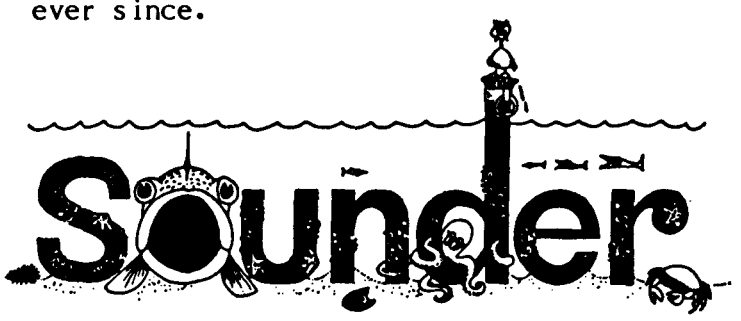
After "a successful run of five months," the NOB News underwent a change in name and format. A "Name the Newsletter" contest encouraged scores of entries, including: Murky Monthly, Cry of the Wild Sockeye, Son of NOB News, and Filet of Fish Tales.

But the name chosen was Sounder, submitted by Alice Sunderland. The new name spread across the September, 1972 issue, big and bold, and Sounder became a regional paper.

By this time, Sounder's 12 or 16 pages were partially filled with newsclippings, but the emphasis began to shift gradually toward more contributions from Fisheries staff. Of course, there was some coaxing from the editor--the July, 1973 edition featured a blank page

with this explanation: "RESERVED for i) late, ii) promised, iii) field articles."

That year was also the first of the "annual" Sounder photo contests; 206 entries were submitted. The "Spurious Emissions" column also was started up about this time, and it has been popular ever since.



July-Sept 1977 Vol.V No.3 Fisheries and Marine Service

Even from the outset, Sounder had its moments in the limelight.

In "July, 1972" (read 1973), Sounder's front page story caused a kerfuffle, resulting in a recall of all newsletters. The article, entitled "Don't Be Stupid--Eggs are Not Fish," was said to have "impugned the honor of a judge," said editor Maxine Glover.

The story had discussed the B.C. Court of Appeal's decision on a section of the Fisheries Act. The Justice Department was called in for a legal opinion, and rumors spread that both the writer and editor would be charged with contempt of court.

After some newsletters were retrieved, the furore began to die away. "Because of that, we now have an editorial board," Maxine says.

In late 1974, the editorship was placed in Kate Glover's hands, and the newsletter continued providing readers with the features which had become established in Sounder--cartoons and light humor, letters to the editor, seafood recipes, Spurious Emissions, and staff-contributed articles.

In the fall of 1979, Kate Glover moved to the Information Branch in Ottawa for a one-year secondment. Maxine Glover resumed editorship and the newsletter was contracted out to her. Changes were made in format, style and content. It began to rely more heavily on written contributions from Department staff, or articles written by Sounder's editor.

Sounder editorial staff changed again in April of 1980: Mike Youds joined Maxine and still shares responsibilities as editor. Gayle Talbot, formerly Bob Humphrey's secretary, also joined Maxine and had a stint as Sounder's assistant editor.

In December, 1980, Sounder's masthead received a facelift. Joe Kambeitz' sketch of a gaping fish mouth was replaced by a five-centimetre high illustration of the Pacific Region. One of the first comments on this miniature Pacific Region came from Bev Bowler, SEP publications designer who once pasted up the Sounder. "What's that boot doing on the front page?" she asked.

Just for the record, Sounder is published eight times a year for the staff of the Department of Fisheries and Oceans, Pacific Region. Copies are distributed to all SEP facilities, fishery officers and patrol vessels in the Pacific Region. It is your paper, and relies heavily on articles contributed by Department staff, so feel free to call or write and tell it like it is.

Over the years, Sounder and its predecessors have carried an odd assortment of copy--from technical information about developments in research to seafood recipes to birth announcements--with the primary intention of keeping you informed, but also to brighten your day with amusing articles.

We hope that we've succeeded.

Cindy Low,
Contributing Writer

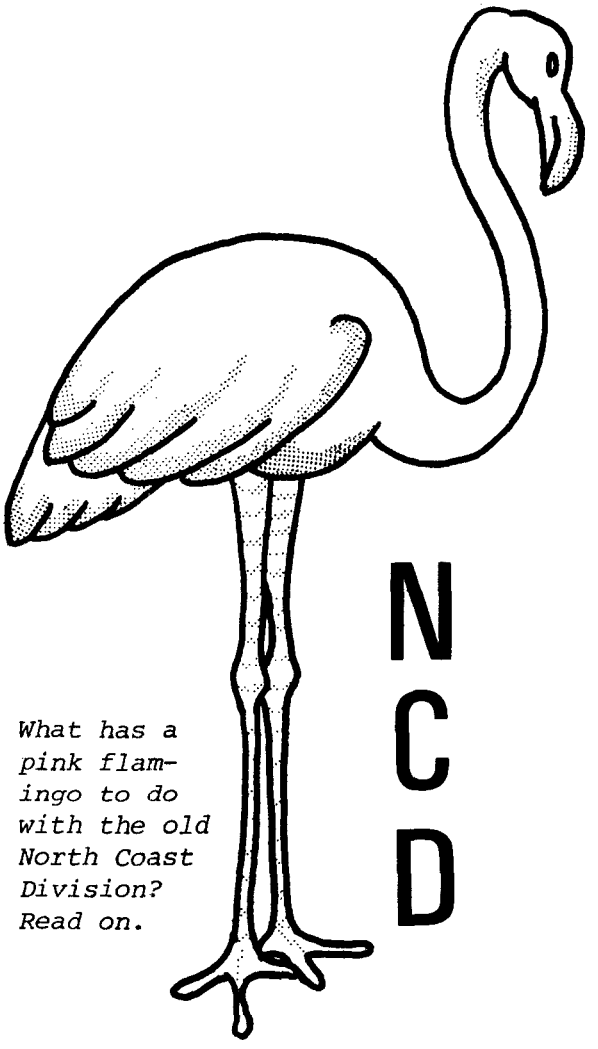
...and what ever happened to the pen of Hugh McNairnay, fishery officer and cartoonist? Hugh now lives in Salmon Arm.

Ten years of change

There have been many changes in Pacific Region organization during the past ten years, including a change in the Department's name to "Fisheries and Oceans" from "Environment." In 1972, the Salmonid Enhancement Program did not exist; the Pacific Biological Station, Pacific Environmental Institute and Technological Station at UBC were all part of a separate organization, the Fisheries Research Board of Canada, and there was no director-general position in Pacific Region. Field Services Branch was divided into a Northern and Southern Operations Branch and the Department was heavily into the latest management technique, MBO (Management by Objectives). Interestingly enough, Field Services seems to be approaching that particular organizational structure once more. Victoria was not a separate district as it is today, and Rivers and Smith Inlets together formed a district. Support Services Branch did not exist; Ship Division (Marine Services) was part of Field Services, as were the radio and electronic technicians; the chief financial officer and administrative officer reported to the director.

As you can see from the 1972 list of supervisory positions, many people have retired or moved on in the past ten years. Not a single district supervisor on staff in 1972 is working with us today. In fact, of the 50 positions listed, only 16 of those staff members are still working for the Department in Pacific Region today.

Nineteen seventy-two marked the one and only year that the "Robe of Merit" was awarded; Vic Giraud, district supervisor, Prince Rupert, received the award in honor of his appointment as the "Grand Hunter, Superior Skulker and Wizard Strategist of the Order of Flamingos and Other Exotic Birds." (G.H.S.S.W.S.) This award recognized his leadership in a midnight foray in search of honor for his troop. No other person has since laid claim to this award. We understand that Vic, happy in retirement in Chilliwack, now spends his time feeding the wild birds and occasionally landing the odd sturgeon.



What has a pink flamingo to do with the old North Coast Division? Read on.

Comparing budgets is an interesting exercise. The figures in table below equal the entire Pacific Region budget for all branches; dollars include salaries, operations and maintenance capital.

The DFO budget: 1972 and 1982

Fiscal Year	Program	PYs	Total Dollars
72/73	Mgmt. & Research	925	18,453[1]
81/82	Mgmt. & Research	945	44,060
81/82	SEP	264	30,663

[1] in 1981/82 constant dollars, this amount would be equivalent to $40,000 million.

If SEP is excluded, there has been only a 2.2 percent increase in person-years to Pacific Region (some positions were transferred to SEP when the branch was formed). Total dollars

have increased 138 percent, but much of this increase can be attributed to salaries, which averaged $9,800 per person in 1972/73 (excluding Research Board personnel). Today's average is $24,900.

In 1972, the daily travel allowance increased from $10.50/day to $11.00/day, due to an increase from $4.00 to $4.50 for dinner. Today's travel allowance is $21.90/day.

In 1972, fish landings in B.C. totaled 153,092 metric tons with landed values of $75.1 million. In 1981, preliminary figures indicate 165,407 metric tons of fish, valued at $220.9 million, were landed.

Today, MBO is a thing of the past but management supervisory training is being emphasized. Decentralization of management staff has occurred and there will be more to come for Habitat Management staff as well as support staff. Demands on the fishery resources from all users continue to grow and stocks are declining. Staff face an enormous task to halt these declines in stocks and their habitat in order to conserve and enhance the fisheries resource for the benefit of all Canadians. And, of course, the Sounder carries on.

Frances Dickson
Field Services Branch

Where were you in '72?

DEPARTMENT OF ENVIRONMENT
FISHERIES AND MARINE SERVICE
1972 ORGANIZATION

Director - Rod Hourston (retired)
Chief of Finance - Bill Scholey
Chief of Administration - Dave Kerr (retired)
Director of Personnel - Gordon Courtenay (last heard of in radio business in Ontario)
Manager, Special Economic Programs - Dick Roberts (Ottawa)
Director, Fisheries Research Board, Pacific Biological Station - K.R. Allen (studying Australian whale populations); Keith Ketchen, Acting July-Dec. '72; Wally Johnson, appointed in December '72.
Director, Fisheries Research Board, Vancouver Station - Dr. Bill Razzell (left government service)
Chief, Information - Pat Brennan (retired)
Director, Pacific Environmental Institute, West Vancouver Lab. - Dr. Mike Waldichuk

Director, Northern Operations Branch - Ron MacLeod (Ottawa)
Chief, North Coast Div. - Rod Palmer
Sr. Biologist - Phil Murray
Chief, Central Coast Div. - Bern Hawley (retired)
Sr. Biologist - Dave Schutz
Chief, Northern B.C. and Yukon Div. - Al Gibson
Sr. Biologist - Chuck Walker (B.C. Hydro)
Chief, Economics & Sociology Unit - Bill Sinclair (Dept. of Environment)
Chief, Technical Support Unit - Al Wood
Enhancement Engineering, Sr. Engineer - Dennis Deans
Enhancement Special Biology - Ron Ginetz (seconded to Ottawa)
Technical Information & Development - Peter Ryan
Chief, Environmental Quality Unit - Bill Schouwenburg
Chief, Northern Operations Control Unit - Jim Connor (retired)
Head, Licencing - Jack Ellis (retired)
Head, Northern Marine Service - Bob Mallory (deceased)
Chief, Regulations Unit - George McIndoe (retired)
Director, Southern Operations Branch - Dick Crouter (Director-General, Halifax)
Chief, Fraser River - Johnstone Strait Div. - Ian Todd (Transpacific Fisheries)
Sr. Biologist - Fred Fraser
Sr. Engineer - George Nielsen
Chief, Georgia Strait Div. - Ed Hollett (fruit farmer, Okanagan)
Sr. Biologist - Sandy Argue (South Pacific Commission, New Caledonia)
Engineer, - Wilf Eddy (DINA)
Chief, West Coast Vancouver Island Div. - Bob McIndoe (retired)

Where were you?

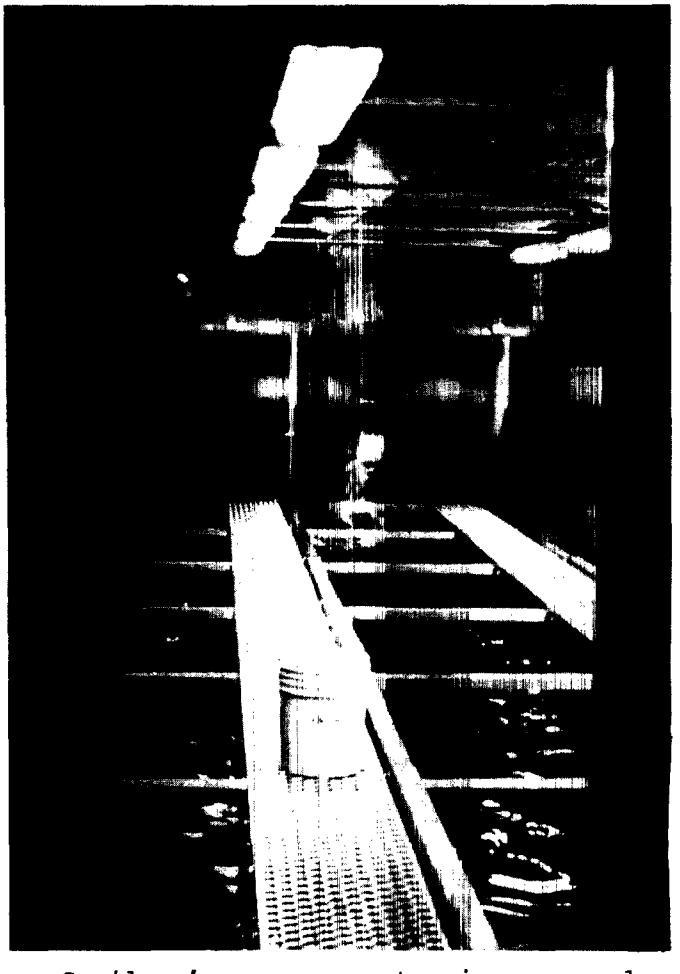
continued from page fifteen

Sr. Biologist - Bob Humphreys - Herring; Ken Pitre - Salmon
Engineer - Otto Rapp
Chief, Economics and Sociology Unit - Phil Meyer (on leave - consultant, California)
Chief, Habitat Protection Div. - Forbes Boyd
Chief, Marine Services Div. - Mitch Gay (retired)

District Supervisors

1 Kamloops - Les Goodman (retired)
2 New Westminster - Harry Burrow (retired)
3 Nanaimo - Bill Winsby (retired)
4 Port Alberni - Pat Harrison (retired)
5 Campbell River - Joe Fielden (retired)
6 Rivers Inlet and Smith Inlet - Jim MacKay (last heard: car salesman, Abbotsford)
7 Kitimat - Ed Christiansen (retired)
8 Prince Rupert - Vic Giraud (retired)
9 Queen Charlotte - Doug MacIntyre (retired)
10 Whitehorse - Garnet Jones (two year interchange, Fisheries Association of B.C.)

Cave fish of Capilano



Capilano's sewage system is now used for rearing fish. Pictured here are the old filter chambers.

Scratch your head a bit and think about this one.

When the Capilano hatchery was built in 1971, one of its features was an underground filtering system designed to clean the hatchery outflow (effluent) before it entered the river. The system, modern and innovative like the hatchery itself, was in operation for about five years.

Today, after a few modifications, the filter chambers are being used as additional rearing space for juvenile fish. To boot, this unique rearing facility appears to be a success.

Why was the filter system converted?

"The outflow did not alter the quality of the river water downstream of the hatchery when the filters were not in use," explained Eldon Stone, Capilano hatchery manager. Therefore, hatchery staff came up with the idea that the filter chambers (after removal of gravel and plumbing) could be used for additional rearing areas for juvenile fish, he said.

Still puzzled?

John McNally, who was the project engineer for the Capilano hatchery and is now a senior implementation engineer in the Department, agreed that the situation seems peculiar upon first glance, but some background helps in the explanation.

"When it (the filtering system) was put in initially, it was part of a major thrust in the environmental field," John said.

"We were then a part of the new Department of Environment, and to ensure that the Fisheries Service did not set a bad example itself by polluting or damaging the environment, the Department opted for the waste-treatment facility," he said.

However, the levels of potentially harmful effluent from the hatchery when measured under actual operating conditions "were less than were originally anticipated, and the effects were less than anticipated," he said. Field tests have shown that the nutrient-rich water from the hatchery combines well with the nutrient deficient water of the river. Field tests indicate that the hatchery effluent enriches, rather than pollutes the relatively cold and sterile Capilano River.

Is the underground rearing system unique in Canada?

"I guess it is," Eldon said, laughing. He noted that some hatcheries do rear fish indoors, and others recirculate the water supply.

"The uniqueness is that we took some filters that were not necessary (and now use them for additional rearing space); and we re-use the pond water," he explained.

"The existing plumbing allows for the re-use of the normal pond water (from the standard rearing ponds located overhead) and/or fresh river water when it is available," he explained.

Because Capilano hatchery production is limited by the available water supply, re-using the pond water may result in a considerable increase in fish output.

In January, 1981, one of the 10 filters was cleaned of gravel and three short raceway ponds were constructed in that space.

About 125,000 chinook fry were reared to the normal 7 to 10-gram size and released in June 1981 without serious problems. The fry were reared on fresh river water part of the time and on used pond water for the remainder. Prior to their release, a number of the fry were coded-wire tagged and fin-clipped.

Later that June, 55,000 late chinook were transferred from the rearing troughs to the filter raceways for rearing to "super smolts" (one year old). They were recently transferred to the adult holding ponds in the hatchery, and will be marked and released in May or June of this year.

There has been no difficulty experienced with those fish to date, Eldon said, but he added that since they were chinook, it will be a couple of years before a full evaluation can be done.

"The crux of the whole thing is whether they grow to adult salmon, and we think that they will."

As for rearing methods, the most obvious difference between rearing fish in the filter chambers and in the ponds outside is the use of an artificial photoperiod.

Life is black or white for the fish in the raceways - morning and night are instantaneous by turning the lights on or off. Both of these changes cause some temporary panic among the fish, but there appears to be no other detrimental effect of the artificial photoperiod.

He indicated that modification and expansion, probably involving coho salmon, are being planned for the coming year.

Cindy Low
Contributing writer

Groundfish: under or overfished?

Effective use of the marine resources of western Canada continues to attract attention, and two of the more frequent questions raised are: how well are we utilizing the groundfish resources and is the resource underfished or overfished? The answer to the latter question is yes. Some are underfished, a few are overfished, and most are utilized at near-optimum levels. A brief account of groundfish production must necessarily precede a discussion of stocks.

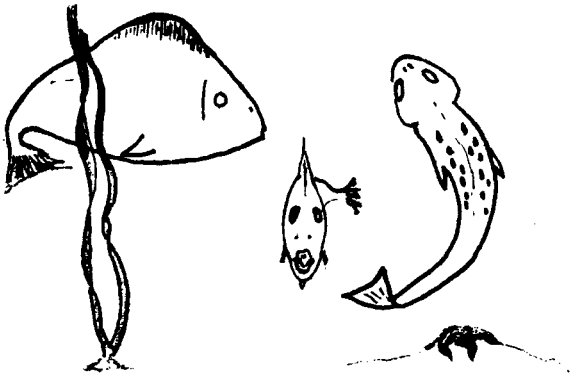
In 1980, total groundfish landings in B.C. were 39,000 t, marking a near-continuous increase from the 16,000 taken in 1970. Principal species were: rockfish (six to ten species), representing 25 percent of the groundfish harvest; Pacific cod, 22 percent; flatfish (three to six species), 16 percent; dogfish (or mudshark), 13 percent; and sablefish (blackcod), 10 percent. In addition, approximately 18,000 t of Pacific hake were caught, most of which was processed aboard foreign factory trawlers. In 1981, groundfish landings through mid-November are estimated to be 33,800 t, and approximately 25,000 t of Pacific hake were caught, of which some 18,000 t were processed aboard foreign factory trawlers.

Some species are sufficiently abundant that full utilization would produce an appreciable increase in B.C. trawl production. However in all cases, new or expanded markets would be necessary. Major species (or members of major species groups) which qualify are widow and yellowtail rockfish, arrowtooth flounder (turbot), butter sole, dogfish, walleye, pollock, and Pacific hake. The only unutilized species is ratfish. Together, these species fully utilized might well add 30-40,000 t to B.C. landings of groundfish.

Hypothetically, a doubling of production of groundfish might justify immigration of vessels from the overcrowded salmon and/or herring fisheries. Unfortunately, less than half of the licenced trawl vessels are currently active.

Canada is indeed fortunate that few groundfish stocks are classed as overfished, and no major stock has been depleted, to our knowledge, due to pollution or other adverse environmental factors. Overfished species include Pacific ocean perch (a rockfish species), ling cod, and rock sole. Pacific ocean perch stocks off West Vancouver Island, in Queen Charlotte Sound, and off west Queen Charlotte Islands are considered moderately to severely depleted. Overfishing is attributed to Japanese and USSR trawling operations conducted prior to 1977, when Canada declared its 200-mile zone extended fisheries jurisdiction and began imposing restraints on the virtually unregulated offshore fisheries. Ling cod stocks in Georgia Strait are probably overfished, but the cause or causes are not readily evident. A similar situation was thought to exist off West Vancouver Island, but overfishing, if any, was probably light. The rock sole stocks in Hecate Strait are likewise overfished, and the cause has been described simply as too much effort expended by the Canadian trawl fleet. Regulations have been imposed to rehabilitate the depleted stocks. These regulations were promulgated by the Offshore Division after consultation with personnel from Resources Services Branch and representatives from the fishing and processing sectors of industry. Furthermore, all parties review, at least annually, all regulations, the results of current stock assessments and research programs.

Jergen Westrheim
Head
Groundfish Section



Letters

Dear Editor:

Mike Healey painted a fairly optimistic picture of B.C. wild stock chinook in the last issue of the Sounder. His statement, " ... chinook stocks are certainly overfished, but the degree of overfishing is much less than we at first suspected," is based on a stock/recruitment curve that indicates that chinook stocks are underfished, not overfished. This is contrary to the assessments of nearly every manager I have spoken to and is certainly contrary to my experience on the Fraser.

During my secondment to Al Wood's regional planning group, I have prepared an alternate stock/recruitment analysis for wild stock chinook in which I have reexamined some of the assumptions made by Mike. In particular, there were two assumptions which disturbed me and which I felt biased his conclusions:

1) All escapements over the 30-year period are equivalent. That is, a spawner enumerated in the 1950s is equal to one spawner counted in the 1970s.

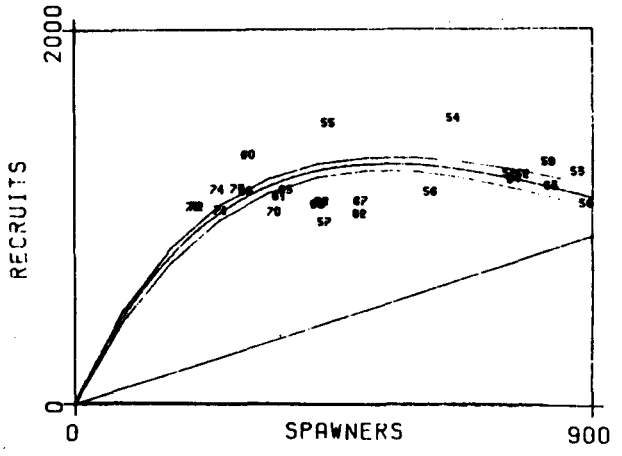
2) Stock composition estimates have been static over the 30-year period. That is, B.C. wild stock chinook are contributing as much to the fishery in the 1970s as they were in the 1950s.

My analysis changed each of these assumptions systematically with some surprising conclusions:

1) I believe this assumption is probably not true, because considerably more effort has been expended recently on chinook enumeration. Therefore, I scaled escapements upward in the 1950s, relative to the 1970s (I used Fraser River directed chinook gillnet catch as an adjusting factor). The optimum escapement was increased to at least 350,000, the curve became much more dome shaped (see accompanying graph); and the indication was that serious overfishing of chinook began in the early 1970s.

2) Again, I believe this is probably not a true assumption, as the proportional contribution by hatcheries has increased over the 30-year period. As I increased stock contributions in the 1950s relative to the 1970s, the optimum escapement was further increased to about 375,000.

Stock and recruitment curve for B.C. wild chinook stocks.



Stock is plotted by brood year on the horizontal axis and the resulting recruits (catch plus escapement in succeeding years) is plotted on the vertical axis. The scale is in thousands and the optimum escapement is indicated. The curve parameter which indicates the productivity of the stock (Ricker "A" parameter) is about two, approximately equal to that for a productive sockeye stock (Fraser sockeye, for example) and is equivalent to a total harvest rate of about 70 to 72 percent at optimum. Note: the two outside curves are 80 percent confidence lines and the straight line is a one-to-one replacement line (spawners=recruits).

An additional assumption that I pursued was that changing fishing patterns have seen a lowering of the average age at catch in the 30-year period. That is, more younger fish are harvested without any real increase in production (fish are caught which would have died anyway). If catches of younger fish are given less relative weight value older fish, the optimum escapement is unchanged, but the stock appears to be less productive than before.

The picture that is emerging from my analysis is one which seems to be consistent with the history of the chinook fishery. Chinook were

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underharvested in the 1950s and the early 1960s, and as harvest rates increased, catch also increased. Escapement reached optimum levels sometime in the late 1960s and production (and catch) peaked four years later in the early 1970s. Since then, both catches and escapements have declined because of increased harvest rates beyond optimal levels. Hatchery production masked some of the decline in wild stock production, at least at first. But now the decline is so rapid that increases in hatchery production are not occurring fast enough. Finally, if we total all the optimum escapements for chinook from the Department's Expectations Bulletin, we get about 550,000 chinook. This is double the optimum calculated by Mike Healey (200,000 to 250,000) but is very close to the optimum arrived at by my analysis.

My own feeling is that the field assessments of our fishery officers and biologists are probably more representative of the true productive potential of our streams for this species. It was gratifying to me that my analysis came as close to these published estimates.

Paul Starr
Management Biologist
Fraser River, N.B.C., and Yukon Division

Spurious emissions

New staff joining the Department include: Joanne Maloney, a statistician formerly with B.C. Telephone Co., who is chief of Statistics, Economics Branch; Gin Farn, senior chemist, Vancouver Inspection laboratory, who comes from the Health Protection Branch, Ottawa; Valerie Wood, clerk, Inspection in Prince Rupert; Rita Morris, receptionist, Special Projects Division, SEP; Barry Peters, community advisor, SEP, Terrace.

Barry was formerly self-employed in that community. Also arriving is Les Powell, forest hydrologist, Land Use Unit, Habitat Management. Les comes from the Forestry Engineering Research Institute of Canada. Barry Cordocedo joins us as community development project manager, working for Special Projects Division, SEP. George Makihara, formerly with the fishing industry, is now an inspection officer in Vancouver.

* *

Recent births include: a son, Graham Thomas, weighing 4.1 kg (9 lb. 5 oz.), was born February 14, 1982 to Becky and Gord Kosakoski, Habitat Management; a daughter, Erin Katherine, weighing 4.3 kg (9 lb. 10 oz.) was born January 13, 1982, to Cheryl and Mike Flynn, Habitat Management; and a son, born February 22, 1982 weighing 4.1 kg (9 lb. 6 oz.) to Bob and Judy Glenn, Special Projects Division, SEP. Heavyweights all!!

Laurie Gordon was successful in the recent competition for assistant supervisor, Prince Rupert, and assumes his new duties in mid-April.

* *

The recent competition for regulations officer was won by Wayne Lowdon, formerly subdistrict fishery officer in New Westminster.

* *

Jim Morrison has transferred, by competition, from Water Use Unit to Water Quality within Habitat Management Division.

* *

Fishery officer moves include: Tom Germscheid who has transferred to Surrey Subdistrict; Greg Savard moves to Bella Coola from Prince George; Brian Hume goes to Tahsis from Port Alberni; Brian Lunn has transferred from Nanaimo to Dawsons Landing, and; Lyle Enderud, who was transferred from Squamish to Masset.

* *

Dave Schutz has accepted the position of salmon coordinator in Vancouver. Don Anderson will be moving from Prince Rupert to the senior biologist's position in Nanaimo. Dennis Brock has returned to Nanaimo from his secondment to Vancouver.

SOUNDER

Staff newsletter of the Department of Fisheries and Oceans, Pacific Region

Volume X Number Three April-May 1982

Creatures great and small

The overwhelming economic importance of salmon on the Pacific coast commands the attention of most regional staff. Yet sharing the salmon resource with the human species is a menagerie of marine mammals, some of which are the subjects of ongoing studies at the Pacific Biological Station in Nanaimo. In this issue, Dr. Mike Bigg explains the work of the marine mammals section.

Feared, hated, slaughtered and hunted until the recent past, marine mammals now form a part of the B.C. coastal environment that is highly valued by the general public. Some prejudices, occasionally justified, still exist. The Department has a mandate to protect and manage these creatures, and the marine mammals section of the Fisheries Research Branch (formerly the Resource Services Branch) is charged with the responsibility of improving knowledge of the main species.

Objectives of this section are to determine the abundance, movements, population biology and diet of all species inhabiting our coast. Those currently being studied include the northern fur seal, killer whale, sea otter, sea lion and harbor seal. Only the northern fur seal is harvested; the others have been protected under the Fisheries Act since 1970.

Management of northern fur seals is by the North Pacific Fur Seal Commission whose members include Canada, Japan, USSR and USA. Under this agreement, about 30,000 three to four-year-old males are taken annually on rookeries off the USSR and USA. Canada receives 15 percent of the total skins in return for not hunting the species in our waters and for undertaking research. Several hundred thousand fur seals migrate annually through B.C. waters, 15 to 150 km offshore, mainly from December through to May. Most are pregnant females en route from summer breeding areas on the Pribilof Islands to the primary wintering area off California. The total number on the Pribilofs is about 1.25 million. Their main diet off our coast is herring, with squid and salmon also of importance, along with a variety of offshore fish.

Killer whales occur throughout the B.C. coast although most frequently off eastern Vancouver Island in south-

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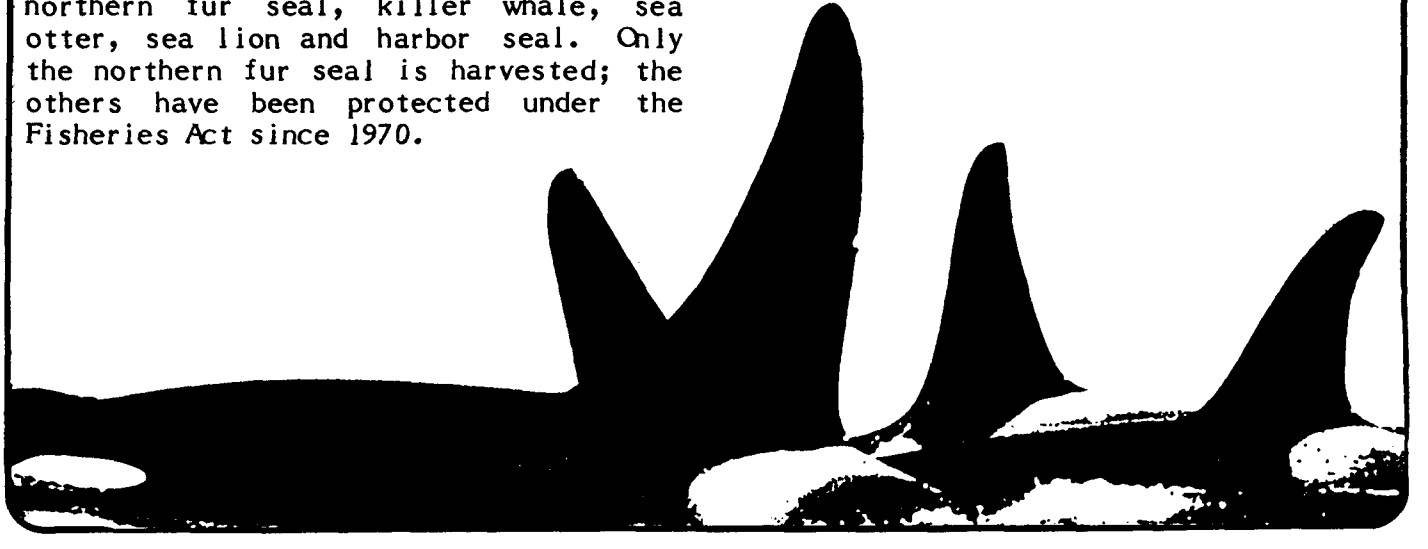

Letters

The great wild chinook debate: part two

Dear Editor,

Stock assessments are the stuff of controversy among fishery biologists all over the world. Consequently, I was pleased to see that Paul Starr was interested enough in my assessment of the status of our wild chinook stocks to prepare a rebuttal. To keep the debate open and lively, and because I don't agree with Paul's assessment, here is some more food for thought on chinook.

First, let me remind staff that I did not say our chinook are underfished. My analysis indicates that they are overfished, and that is what I said. The difference of opinion between Paul and me is really about what is the optimum coastwide escapement for B.C. chinook; my analysis indicates 200,000 to 250,000 as compared to Paul's 350,000 to 400,000.

Paul took exception to two assumptions in my analysis: 1) that the accuracy of the escapement record for chinook has not changed substantially since 1951; and 2) that the proportion of wild Canadian chinook in our coastal fisheries has not changed substantially since 1951. Paul believes that systematic changes have occurred in both these factors. Since these two assumptions, particularly the assumption about escapement, are important to the assessment of chinook stocks it is worth taking a look at them in detail.

Paul states that the recent escapement record should be more accurate because more time has been devoted to chinook counts. He further suggests that the early season gillnet catch in the Fraser is a better index of escapement than the spawning ground count and he uses this catch data to adjust the coast-

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Cover illustration: Line "drop-out," from a photograph taken by J. Ford of UBC. Pictured are three bulls and one juvenile killer whale.

Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Correction

An error was made on page 14 of the March 1982 issue of the Sounder. The table footnote should have read $40 million rather than $40,000 million. Wishful thinking.

Great and small...

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eastern Hecate Strait. Our recent development of identifying individuals by photographing unique markings has greatly improved knowledge of the species. About 300 live here year-round in 35 pods. A pod is a long-term breeding group composed of the same individuals. These periodically join to form communities. Off eastern Vancouver Island there is a southern community of 150 whales and a northern community of 80 whales, their boundary line being northern Georgia Strait. The species seems long lived, up to 100 years, and slow reproducing, averaging only one calf per cow every ten years. Their main summer food appears to be salmon.

Sea otters, which were hunted to extinction in B.C. by about 1930, were reestablished here by three transplants from Alaska by Fisheries and Oceans, B.C. Fish and Wildlife Branch and Alaska Fish and Game Department. In all, 89 sea otters were released during 1969-72 at the Bunsby Islands, off northwest Vancouver Island. We located two colonies in 1977-78, one of 55 near the Bunsby Islands and another with 15 at Bajo Point 80 km south. The next few years will tell whether these colonies are growing and are thus permanently reestablished. Sea otters eat shellfish and small inshore fish.

Sea lions and harbour seals have historically attracted much attention from B.C. salmon fishermen. While most individual animals do not interfere with fishing, some learn to remove salmon from nets and lines and thus become a local nuisance. This habit resulted in intensive control programs from 1915 to 1965. Because they have been protected since 1970, their numbers have probably increased. Certainly complaints from fishermen have increased leading some to request resumed control measures. However, none are anticipated unless it could be shown ecologically and economically that these species are detrimental to the area. We are starting a new research program this year to keep ahead of these issues. Earlier studies indicate that there are about 1,000 California sea lions off southern Vancouver Island and about 6,000 Steller sea lions in B.C. Harbor seals may total 30,000. The diet of Stellar sea lions is largely hake and rockfish with flatfish, squid and salmon also eaten. Harbor seals eat mainly noncommercial fish found near shore.

Mike Bigg
Marine Mammals Section
Pacific Biological Station

Counting seals on St. George Island in the early 1940s.

Kemano revisited

Two years have elapsed since the Department took legal action against Alcan over water flows below the Kenney Dam. Habitat's Rob Russell provides an update.

In June, 1980, flows in the Nechako River declined to 408 cfs, the lowest on record since the closure of Kenney Dam and the beginning of regulation of river flows by the Aluminum Company of Canada in the early 1950s. Despite a ministerial order demanding increased flows for protection of the fisheries resource, Alcan maintained less than 1,000 cfs in the Nechako until a court injunction was granted by the Supreme Court of B.C. in July, 1980. The injunction confirmed the Minister of Fisheries and Oceans' authority to ensure adequate protection of fish and fish habitat. Since 1980, the Minister, on the advice of Habitat Management staff, has regulated Nechako flows.

The Water Use Unit initiated fish resource maintenance flow and spawning/incubation studies in the Nechako River in summer and fall, 1980. The work, originally intended to supplement data collected in the mid-1970s, has expanded our knowledge of the rearing, migration, spawning and incubation requirements of chinook salmon to the point where final recommendations for fish maintenance flows should be available by late 1982.

Additional studies to be carried out on the Nechako System in 1982 include an assessment of the benthic productivity of several categories of river substrate, measurement of periphyton growth and determination of the effect of reduced fall and winter flows on chinook eggs and alevins in dewatered or frozen redds.

The unit has also begun fish maintenance flow studies on the other river systems which may be impacted by Alcan's as · yet unproposed Kemano completion project. Kemano completion may significantly alter the discharge regime in the Nanika, Morice and Kemano Rivers. In 1982, bioengineering studies on these rivers will include assessment

Alvin Sewid and Kevin Conlin gather eggs for planting. Egg plants will provide information on winter survival.

of overwinter rearing habitat afforded by sloughs and sidechannels and initiation of hydrological studies to determine sediment transport and bedload movement.

In addition to conducting environmental studies, Habitat Management coordinates the Alcan Technical Committee [representatives from DFO, International Pacific Salmon Fisheries Commission, Ministry of Environment, Alcan and Envirocon, (consultants to Alcan)] which is responsible for reviewing the existing fisheries data base and defining the terms of reference for future environmental studies. Other activities include participation in flow methodology and river temperature/flow relationship workshops and, with the IPSFC, acting on behalf of the Department to administrate flow release in the Nechako River to ensure fish protection and prevent flooding.

by Rob Russell
Water Use Unit,
Habitat Management Branch

The courtroom tightrope

Prosecutions under the Fisheries Act are growing more reliant upon the testimony of the expert witness who can often make the difference between success and failure.

Dr. Ian Birtwell

This article is written in self-pity while on bended knee; an attitude and posture partially related to the past season's duck hunting forays, but more a result of my limited experience as an expert witness in the prosecution circus.

Depending on your point of view, our prosecutions may be considered the first or last line of attack or defence against those who break the law. Legal proceedings against offenders are obviously essential, and especially so when used intelligently. Since joining the Department in 1974, I have been requested to be an expert witness in a dozen cases related to pollution and habitat problems. Last year I appeared in court five times. There is little relevance in these statistics, except that they possibly reflect an increasing number of prosecutions in the environmental area and the scarcity of qualified staff as expert witnesses.

Two contrasting views probably contribute to the expert witness problem. There is a widely held belief that most of our staff can be expert witnesses and an opposing view that only a few are worth sending a subpoena. The sources of both sentiments are to be found in our organization. Administrators usually consider that we have many talented staff who are well qualified at their jobs and who therefore can appear in court with little preparation. Yet those with direct courtroom experience (Justice Department lawyers and fishery officers) want proven balancing acts; people who are not going to fall off the often shaky tightrope between success and failure.

The expert witness role is a difficult one. Under cross-examination it is easy to lose one's balance. Falling off the rope may ensure a quick death as an expert witness, but this rarely happens. All too frequently, one seems to be in an uncomfortable position, sitting astride the rope with both counsels pulling and pushing to change the balance. You don't see expert witnesses smile very often!

Perhaps ideal expert witnesses should be experts in their fields, knowledgeable of pertinent legislation, having had years of relevant experience and having been published extensively, in addition to being well organized, thoughtful, cautious and calm under pressure. No wonder we have trouble finding them! Gone are the days when qualification was related to three days' experience. Defense counsels have become well organized, highly critical and expensive. Mercenaries can always be found in the private sector. We now face some excellent lawyers and supporting acts (Richard Burton has yet to appear) whose preparation and theatrical abilities often exceed those of our Department and our lawyers. So much for the make and buy policy.

My contention is that we should do better, but this will only occur through more cooperation and understanding between involved parties. We would be assisted in legal proceedings if we had a legal advisor in-house and lawyers devoted to our legislation and environmental issues. I am sure our

expert witnesses...

district supervisors could keep them busy. In light of the seriousness of prosecutions, it does not seem unreasonable to request such assistance, but this is probably a naive opinion. We do get assistance from the Department of Justice and other lawyers, but I have not always felt comfortable with our preparation. It is an area where we could do better.

In 1978, I was asked to present some opinions regarding the role of expert witnesses and the provision of expert advice, to FSB staff. At the same meeting, Digby Kier (one of our best lawyers and second-hand car experts) spoke about testing the then new habitat legislation. The subsequent rush for precedent cases was met by an equally impressive retreat by expert witnesses, who became extinct overnight. Since then, we have progressed towards testing the legislation and providing advice, but not without a few pains and th· significant efforts of some staff (Tom Bird, Dennis Brock and others).

A procedure is in place to provide expert advice and witnesses. If you need an expert witness, contact Tom Bird (666-3166) at 1090 West Pender. He is the coordinator and after discussing your requirements, will ensure that an expert is chosen. A list of experts, which will be kept confidential--for obvious reasons--has been compiled. In order to share the workload imposed by appearances in court, people will be selected from the list. The procedure is very simple, but obviously will not satisfy everyone; only last week one of my friends was called upon to appear in court with only two day's notice. Is this fair? Preparation for court takes time. It is shortsighted to circumvent the process. We need more friendly expert witnesses, not more overworked and frustrated staff!

The Department has some excellent and knowledgeable staff, many of whom are internationally recognized experts in a variety of fields, but few have been on the tightrope. Understandably not many people wish to perform, however it is a Departmental responsibility and all experts should anticipate appearances in court from time to time; that is, staff in all Branches should participate and not just staff from the Habitat Management Division. (I understand that we have many "habitat advisors" in the Department.) To help prepare people for the expert witness role, a course is being offered this year due to the efforts of staff from the Environmental Protection Service and our Department. Staff who are interested should contact Tom Bird.

To summarize, if you need an expert witness, use the process now in place: contact Tom Bird, provide a good lead time so the expert witness can prepare for the case and win a friend.

P.S. Thanks to Scotty Roxburgh for an acknowledgement; I just fell off the rope!

Ian Birtwell
Head, Salmon Habitat Section
Fisheries Research Branch

Dubitative definitions

Dave Wilson, formerly a biologist with SEP and now working for Montreal Engineering out of Halifax, has sent us a glossary of fish and game terms. The glossary was first compiled, with painstaking care no doubt, by Si Nathenson, a former information and education officer with the California Department of Fish and Game. Outdoor California printed the glossary in its July-August 1981 issue.

Steelhead - Bathroom on a battleship.

Redd - A species of foxx.

Tidepool - Minnesota Fats and Willie Mosconi in a dead heat.

Downstream - An inferior type of beer.

Kelp - A drowning person's cry for aid.

Slough - Past tense of slay.

Lagoon - French firearm, badly pronounced.

Taxonomy - The science of extracting money from citizens.

Riparian habitat - A fully mature area dominated by Caucasians.

Cutthroat trout - A vicious and unscrupulous fish that competes unfairly with other species.

Game warden - A wildlife protection officer who'll try anything; as opposed to ...

Nongame Advisory Committee - A group that takes no chances and doesn't want you to, either.

Marine mammals - Members of a branch of the U.S. armed forces.

Abalone - A comment expressing disbelief or disgust.

Lobster - Tennis player with a soft shot.

Crappie - A derogatory adjective if pronounced as spelled, which it isn't.

Fry - Useful word that may describe both the beginning and end of a fish's life.

Sierra - Spot a mistake.

Sierra Club - Weapon to use in correcting a mistake.

Coral - Underwater structure containing sea horses.

Plankton - A heavy board.

Phytoplankton - Heavy board used in combat.

Ecosystem - An acoustical phenomenon in which sound waves bounce back to where they started.

Wet lab - A hunting dog swimming back to shore with a duck in its mouth.

Ecological reserve - Trait of a conservationist who doesn't want to talk about it.

Grasslands - Hippie habitat.

Fyke net - False snare set by a cockney.

Population dynamics - Term used by experts to explain wildlife changes they didn't predict.

Natural fluctuations - See "population dynamics."

Soupfin shark - Basic ingredient of sharkin soup.

Size limit - The author will go no further.

Downtown daycare

A questionnaire is being circulated to staff in the headquarters area on the need for daycare services by federal employees in the downtown Vancouver area. Apparently, the government has committed funds to provide basic set-up, rental and maintenance costs for four daycare facilities in Canada. If you haven't seen the questionnaire, contact Personnel Branch for a copy.

Illegal fish sales: black market or injustice?

"Our position on what the DFO [Department of Fisheries & Oceans] calls illegal fish sales is that it ignores the real issues behind the use of fish by native people," said Neil Sterritt, president of the Gitskan-Carrier Tribal Council. The council represents approximately 5,000 people in seven bands in the Hazelton area.

"First of all, we own the fish, and it has been used by our people for food and trade for centuries," Sterritt said. "Not only for centuries, but in the past 100 years, fish were caught by our people and bought by the Hudson Bay for food, and for trading posts in western Canada. When the railroad was built through our land in 1915 to 1920, our people took fish and sold them to the railroad for the workers.

"Whenever it has been in the interests of industry and government," he said, "they have capitalized on native people and the fishery, and it has not been against the law to sell the fish."

The Fisheries Act of Canada states that native Indians can take enough food fish for their own consumption, but it is against the law for them to barter, trade or sell the fish. This, Sterritt said, is "entirely inconsistent with history."

For the Department, the thought of a half million poached salmon per year is difficult to digest. That's a Department estimate of the volume of illegal fish floating around, mainly from the lower Fraser and Skeena River systems. Some of that is Indian food fish sold illegally, and some is both taken and sold illegally by non-Indian poachers. Al Gibson, chief of the Department's management services, said that much of the illegal activities in the areas of the native fisheries take place there because fish are accessible and easily caught.

"When fish are taken illegally, they're being robbed from the spawning stock," said Gibson. "Sometimes, not enough fish get to the spawning ground."

What the poachers left behind: dead salmon lies in abandoned illegal net. Nine nets were seized during one day's patrol along the Fraser in 1981.

That's what has the Department worried. The disappearance of some 250,000 spawners through poaching plays havoc with the Department's attempts to manage certain salmon runs, because the likelihood or level of poaching cannot be predicted. The federal government's primary objectives are to conserve fish stocks, meet native food fish needs, and then allow for the commercial and recreational fisheries. In practice, however, salmon harvesting usually operates in the opposite order--commercial, recreational, native food fishing, and then escapement for spawning. For the native Indians, the problem of being third in the pecking order is aggravated by the fact that those in the back of the line are trying to get their dibs, too.

Explanation: The native food fishery is the last chance, after regulation of the commercial and recreational fishery, for fishery managers to manipulate stocks to ensure that there is an adequate number of spawners. If there is not, additional spawners must be taken from the native fishery. In the past, some bands have indicated that they are, on occasion, unable to satisfy their food fish needs. Native food fish needs have never been determined, partially because Indians are generally reluctant to discuss numbers in the event that the figures are treated as quotas.

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"We do not set a quota on the Indian food fishery, but we can say when they can fish, where they can fish, and what type of gear they can use," said Larry Ottmann, assistant district supervisor for New Westminster.

"Commercial fishing goes on upstream to Mission," he said. "Above that, we have native food fishing. While there are some poaching problems going on with the Indians we have almost every combination taking part in poaching--it's no one group."

According to Gibson, poaching is "focussed on the Lower Fraser and Skeena, mainly because runs are larger, the fish are available, there's lots of population, transportation routes are set up, and there's a market."

"Down here, the fish are a much better quality, and much more marketable," said Ottmann.

The obvious attraction to buyers is the considerably lower price. The sockeye fishery, which runs from June to September in the New Westminster district, is popular among poachers because of the high value of sockeye.

A seven- or eight-pound sockeye on the black market would cost "anywhere from $5 to $10 a fish, depending on the season," he said. The same sized salmon, sold in stores at $4-$6 per pound, could set you back $28-$48. Buyers and volume of sales vary.

"There's a bit of everything, from a major fish plant, restaurants, companies, to almost a house-to-house delivery, in some cases," said Ottmann.

"While we have no exact estimate of the numbers of fish sold illegally, we do know that truckloads of fish are reported to be travelling across B.C. to the Prairies," said Gibson.

"Because poaching is done by fishermen who are not licenced and have no vested interest in the resource, it is very hard to get them turned around," he said.

Both Gibson and Ottmann agree that stiffer penalties for poaching might curtail the illegal activities. Under the Fisheries Act, the maximum fine for poaching is $5,000, plus the loss of any gear (including boats) used to commit the offence. Sterritt said that these measures would not act as a deterrent to the Indians, who proclaim the fish as their own.

"Our people don't want to break laws, but there are some foolish laws around," Sterritt said.

"We feel that the courts have been very sympathetic to the native people; there have been very low fines, and in fact, discharges," said Gibson. "We prefer to go for the buyers."

Sterritt disagreed: "All of the emphasis for the past 10 years has been on our people."

Both the Indian bands and the Department realize that there have to be negotiations to reach a workable solution. Some Indian bands want total control of the fishery in their areas, while others seem content to have the Department administer policy.

Band bylaws have provided bands with negotiating power, said Gibson. The Department is respecting the legal opinion that the band bylaws supersede the Fisheries Act on the reserves.

"We abide by that legal opinion," Gibson said. "We're sort of neutralized there, but no conservation problems have been created yet by the bylaws."

Public awareness is one avenue toward a solution, but "we have an uphill battle to advise the public of the results of buying illegal fish," said Gibson. "It's going to take a heck of a program."

"The system is based on two sets of values," said Sterritt.

by Cindy Low
Contributing Writer

Intensified training program recommended

Dr. Chuck Chestnut, instructor with the BCIT Fish, Wildlife and Recreation Technology Program, recently completed a year's sabbatical with the Department. During this period, he assessed the training needs of the Pacific Region and of prospective employees. He has prepared the following article to summarize his conclusions for Sounder readers.

I would like to take this opportunity to thank the approximately 140 technical staff of the Pacific Region Fisheries who educated me during my ten-month stay with the Department. They include the many fishery officers, fish management technicians, habitat technicians, technical advisors, project coordinators, hatchery technicians, native advisors and research technicians who offered assistance.

The objectives of my stay with the Department were basically threefold:

1) To upgrade my knowledge of the resource base and the commercial, native and recreational fisheries dependent upon it, and to become more familiar with the Pacific Region Fisheries policies and procedures for managing the resource;

2) To identify Pacific Region Fisheries sectors where technically trained employees are (or may be in future) in demand and how training of such people could be enhanced;

3) To consider ways in which Pacific Region's needs for well-trained seasonal and full-time employees, and BCIT's desire to include pratical experience as part of the student curriculum, might be met through Pacific Region - BCIT cooperation.

In addition to the above, I had the opportunity during the meetings, interviews and field sessions with technical staff, to be apprised of many concerns voiced by the technicians. I took the liberty of presenting these concerns in my report to the Department.

For this article I have included from my report the key recommendations

Chuck Chestnut

which relate to the objectives and also those that relate to the concerns of the technical staff.

BCIT - Pacific Region cooperation

1) BCIT should develop a two-year fisheries technician program to prepare students for fisheries technical vocations.

2) The program should include cooperative education packages with fishery agencies, companies and associations in order to provide practical training and knowledge in the listed vocational areas.

3) Existing government-sponsored employment programs should be adjusted to accommodate periods other than the historic summer employment session.

4) Pacific Region should consider utilizing the services of the Continuing Education and Industry Services Department at BCIT to provide technical training modules as required for new and incumbent staff.

5) The Department of Fisheries and Oceans should utilize technological institutes across Canada in a coordinated scheme to formulate standard technical recruit training and to develop training components that fit the Department's objectives.

Pacific Region Fisheries incumbent technical staff

1) Pacific Region Fisheries should create a regional team or unit whose function would be to:

a) develope career programs, for all technical groups within Pacific Region Fisheries, similar to those being developed for fishery officers through the Pacific and Freshwater Fisheries Human Resources Management Program;

b) identify the career training needs of the technical groups;

c) organize courses and programs (either in-house or otherwise) that would be germane to the career development of technicians in Pacific Region;

d) organize special workshops so that Pacific Region technicians may maintain an updated technological knowledge and experience;

e) pursue classification problems related to the "advancement" of technicians within Pacific Region;

f) organize and implement in-house transfers for technicians under a "career-move" concept;

g) organize and implement an orientation program for new technical employees.

2) The training unit should be funded separately from the other sectors of Pacific Region Fisheries.

3) The spokesman role of the fishery officer should be critically examined to ensure that the officer is adequately trained and prepared to handle this critical role.

4) Pacific Region Fisheries should ensure that the qualifications for new recruits, regardless of background or specialty experience, be equivalent.

5) A clear policy related to the issuance of sidearms to fishery officers should be established. If sidearms are to be standard, then an annual qualification that incorporates aspects of firearm use beyond accuracy tests, should be required.

6) The Department should improve the communication system between management staff and fishery officers to ensure that the latest and best information is accessible.

7) The Department should ensure that fishery guardians and seasonal patrolmen are adequately trained to be effective in maintaining the Department's credibility with resource users.

Once again, I would like to sincerely thank all those who made my brief stay with the Department a most enjoyable one. I look forward to maintaining the many contacts I have made and the opportunity of putting into practise the many things that I was taught.

I welcome your comments.

Chuck Chestnut
Fish, Wildlife and Recreation Technology
BCIT

Age determination among freshwater fish

At an annual meeting of Canadian Fisheries Scientists in Ottawa in 1976, Dr. Richard Beamish reported that ages for unexploited populations of freshwater fish such as lake whitefish and lake trout could be underestimated and that these northern fish might well be older than previously estimated. Many of these fish could reach an age of 40 to 50 years.

Ages determined by otolith (ear bone) surfaces and scales appear to underestimate the true age for long-lived species. The otolith surface and scale growth becomes greatly reduced, otolith growth continues, but mainly on the interior surface of the otolith, so surface age determination estimates probably will be in error for larger

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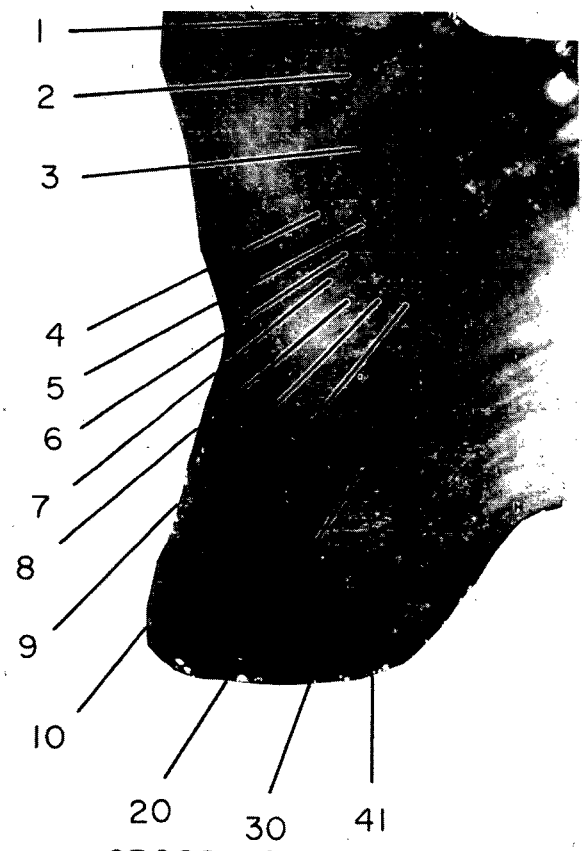
fish aging...

fish. Also, when fish growth is reduced, scale growth is reduced and annual growth zones on scales may be impossible to identify. This has been proven true with fish populations in Arctic Lakes. We recommend that scales be used to age fish only after the ages have been validated for all age classes in the population. In our experience, scales are of limited usefulness.

A cross section of the lake trout otolith can reveal many additional growth zones growing underneath, and as the otolith increases in thickness (and age), the zones often become incomplete and form only on one side. Some people have questioned the validity of counting the growth zones that are visible in the cross section as annuli (annual rings). However, our studies of other species have confirmed that these zones are annuli, so it is probable that the zones on lake trout otoliths are annual zones.

Doris Chilton
Supervisor, Aging Unit
Pacific Biological Station



Cross section of lake trout otolith showing annual rings.

The ten minute casserole

The following recipe was provided by the Fisheries Association of B.C.

Savory biscuit-topped casserole

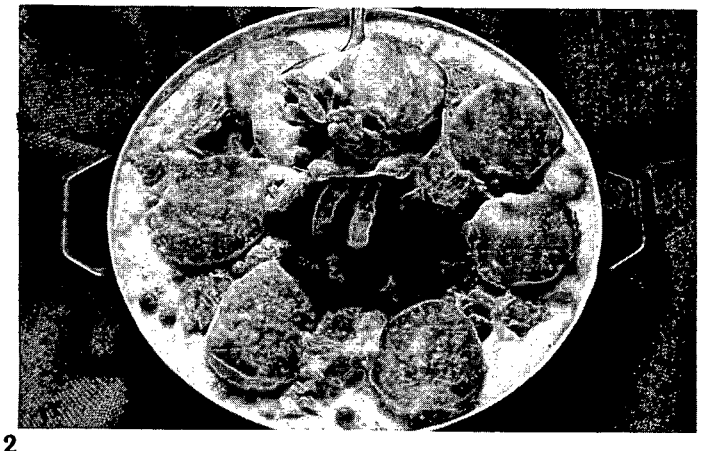
Ingredients:

1/4 cup butter
1/4 cup all-purpose flour
2 cups milk
1/2 tsp. salt
1/2 tsp. pepper

1 tbsp. lemon juice
1 1/2 cups frozen peas
2 tbsp. finely minced parsley
2 cans (7 3/4 oz. each) Pacific salmon
1 package refrigerator biscuits

Melt butter in saucepan; stir in flour. Gradually add milk, stirring constantly. Add salt, pepper, lemon juice, peas and parsley. Stirring constantly, cook until mixture comes to a boil. Remove from heat; break salmon into chunks and fold into sauce. Pour mixture into a greased eight-cup shallow casserole. Top with biscuits. Bake, uncovered, at 475° F (approximately 265° C), for 10-15 minutes or until biscuits are browned. Makes 4-6 servings.

If you have a seafood recipe you'd like to share, call the Sounder at 687-1442.



What you can expect

On October 30, 1981, Isolated Post Directive 1980 was printed. We in the Pacific Region got our official copies in December '81 and they were distributed in January '82.

For those employees who are in a designated isolated post and are covered under these regulations, a copy has been sent to your subdistrict office and one should also be available at the district office. As these are applicable to the posting, please don't take the office's copy as your personal copy. I have to presume other branches have distributed copies to their respective isolated posts. The regulations are written up clearly and concisely, expressly for the isolated post.

I couldn't start to cover each and every item, but I will try to cover the ones that seem to cause problems (some claims have been returned because of improper completion).

First of all, the regulations must be abided by, and again, it's much easier to do claims right the first time than to have them returned again and again for corrections. Remember, it is your money.

One important point is that your dependents are not employees of the Department, and plane fares for them or for yourself cannot be charged when coming out of an isolated area for any purpose. As an employee, you must pay these charges and then submit claims.

Only in some emergency cases has the Department paid 'charged' invoices, but not without a good deal of correspondence and explanation. In fact, these charges could be returned to the employee for payment.

When submitting claims for payment for transportation expenses, please specify the type of leave you were on (vacation, furlough or medical, for example).

If medical or dental treatment is nonelective, which means you must have it, your certificate from the attending medical or dental practitioner must specify this. If you are lucky enough to have a doctor or a dentist in your isolated area and he or she recommends you to another doctor for treatment, you must also be given a certificate containing the above information and then you must get one from the referred medical/dental practitioner to substantiate your attendance. The costs of these certificates are the employee's responsibility and they cannot be reimbursed.

For elective medical or dental treatment which is associated with any vacation leave, and where an employee or his or her dependents require the treatment not available near their headquarters, he or she may be granted additional leave with pay. This is equal to three days or the actual time that is required to obtain the treatment, whichever is less. This claim is permitted only once in each fiscal year.

by Pat Phillips
Administrative Services
Nanaimo

Letters...

continued from page 1

wide escapement record. The implication of this adjustment is that the escapement record for the 1950s underestimates true escapement by a factor of two or three while the record for the 1970s is OK.

The accuracy of recent spawning ground counts relative to those in the 1950s is wholly a matter of opinion. Many people do not believe that the early data are less accurate. Furthermore, spawner counts for spawning beds that are accessible and where the fish are easy to count have declined just as much as counts for beds that are inaccessible or where the fish are difficult to count. This should not be so if the greater

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Letters...

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attention devoted to chinook in recent years has increased the accuracy of escapement estimates to the degree that Paul believes.

Paul suggests that the early season gillnet catch of chinook in the Fraser River is a better index of escapement than the spawning ground counts. This is an interesting suggestion and deserves scrutiny. I have plotted the early season Fraser River gillnet catch for 1963 to 1980. While the figures that I found in the B.C. catch statistics summary are not identical to the figures that Paul used, the trend is certainly the same. Catch in the fishery has dropped dramatically since 1963. Catch during the 1950s was again higher than in the 1960s. Catch cannot be considered independent of fishing effort, however, and since 1963, effort in the early season fishery has also declined dramatically. Catch-per-unit-of-effort is the true measure of relative abundance of fish, not catch alone. Since 1963, catch-per-unit-of-effort has not changed in this fishery.

This analysis shows that the decline in early season chinook catch is best explained by the decline in fishing effort and not by changes in chinook abundance. I have examined other terminal gillnet fisheries for chinook (Nass, Skeena, Bella Coola) in the same way, and the conclusion for all is the same. Early season chinook catches have declined considerably since the early 1950s, but these declines reflect changes in fishing effort. Catch-per-unit-of-effort has not declined in these fisheries. It is my view, therefore, that the early season catch in these rivermouth fisheries is not a good index of escapement and cannot be used to adjust spawning ground counts.

The question of changing stock composition over the years is much less important to the outcome of the stock-recruitment analysis, and the adjustments that Paul made in this factor are relatively minor. Tag return data for the mid-1970s, compared with data from the mid-1960s, suggests some ups and downs in the contribution of Canadian chinook to major coastal fisheries, but little overall change, except in some net fisheries. U.S. hatchery production has increased dramatically since the 1950s, however, so it seems reasonable to assume that there was a greater component of Canadian chinook in our fisheries in the past, even though there is virtually no supporting evidence. In fact, it was by applying this assumption that I obtained my upper estimate of 250,000 optimum escapement. Without drastically altering the escapement record, however, which I consider unjustified, I see no way to get an estimate of optimum escapement, based on stock and recruitment, that exceeds 250,000.

Given the quality of the information available to us, both my assessment and Paul's must be regarded as highly uncertain. It is appropriate to ask, therefore, what is to be gained or lost if we decide to manage by one of these assessments but the other is the truer assessment. Gains and losses can be assessed initially by determining how much catch must be foregone to permit enough fish on the spawning grounds to achieve optimum escapement, and comparing this with the long term gain in yield that will be achieved by sacrificing that catch. The difference between current escapement and my optimum escapement is about 30,000, and the difference between current escapement and Paul's optimum escapement is about 180,000. Therefore, six times as much catch must be foregone to achieve Paul's optimum as must be foregone to achieve mine. Hence, the initial cost to achieve Paul's optimum is much greater.

Suppose that we choose to manage to my optimum escapement, but Paul's is correct. Even though we were managing to below the optimum escapement, we would still have a sustainable harvest, according to Paul's analysis, of about 90 percent of the maximum potential yield. Suppose, on the other hand, that we choose to manage to Paul's optimum escapement, but my assessment is correct. By regulating escapement to Paul's optimum we would be underfishing the stocks, and the sustainable harvest would be only 66 percent of maximum potential

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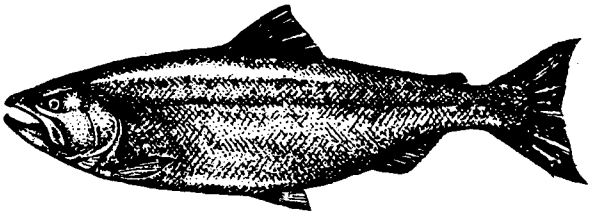
yield. Thus, not only is the initial cost of achieving optimum escapement greater if we use Paul's assessment, the risk of missing out on substantial yield is also greater. I conclude, therefore, that the potential gains associated with Paul's assessment are not great enough to justify the costs associated with achieving his much greater optimum escapement, or to justify the risk of lost yield if he is wrong.

Mike Healey
Pacific Biological Station

Editor's Note: Due to space constraints, we are unable to print Mike's accompanying graphs. The graphs show a) gillnet catch of chinook in the Fraser River prior to the opening of the sockeye fishery, and b) fishing effort in the Fraser River prior to the opening of the sockeye fishery (both are from 1962 to 1980.) Copies of the graphs are available by contacting Mike Healey, 666-8362 in Nanaimo.



Spurious emissions

Kate Glover, Information Branch, was the successful candidate in a recent competition for information officer at Pat Bay, Ocean and Science Surveys, and now has assumed her new duties; farewells were said at On On's. We expect to be well informed of all activities at Pat Bay now that Kate is there. (Does anyone know what happens at Pat Bay?)

* *

Alice Haaf, secretary, SEP Engineering, has left the Department to relocate to the clean environs at 100 Mile House; Alice previously worked as secretary, North Coast Division.

* *

Judy White, supervisor, Licencing, has left the Department and she tells us that after a suitable rest, she'll be trying out her skills as a dog trainer.

* *

Leaving Habitat Management to take up a new position with Transport Canada, Aviation Branch, is Jean Pistone, who fills the position of financial administrator. We understand that Jean reversed the tables at her farewell celebration by presenting suitable gifts to those she'll miss the most!

Joining Management Biology Unit, North Coast Division, is Kevin Bates, biologist, who has moved from Victoria to Prince Rupert, where he'll be working for Paul Sprout on non-salmon matters. Also joining the Department as district clerk, New Westminster, is Nina Ichiiwa, formerly with the RCMP.

* *

Chris Dragseth returns to Pacific Region as district supervisor, Queen Charlotte City. Chris was working with the Department at Meadow Lake, Saskatchewan.

* *

New term employee with the Department of Fisheries is Carmen Perchacz, as secretary to Water Quality Unit, Habitat Management.

Departing acting chief of Pacific Region's Information Branch, Kate Glover celebrates with other staff her ten years at headquarters.

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Spurious...

Recent births include:

- a son, Thomas Robert, weighing 3.7 kg (8 lb. 3 oz), was born on March 27, 1982, to Gordon and Pam Futer, Habitat Management;

- a son, Michael Donald, weighing 3.3 kg (7 lb. 3 oz), was born on March 13, 1982, to Murray and Cindy Green, receptionist, 11th floor;

- a son, Jason Richard Vegas, weighing 2.8 kg (6 lb. 3 oz.), born on March 29, 1982 to Kathleen and Richard Eliasen, Habitat Management;

- a son, Andrew, weighing 1.8 kg (4 lb. 10 oz) was born to Norma and Roy McGechaen, on April 8, 1982.

* *

Recent fishery officer moves include: a promotion to Cindy Harlow, who moves from Campbell River to Nanaimo; Randy Brahniuk, who transfers from Grenville Principe subdistrict to Sandspit; Dave Knapton, who has been hired as waterfront officer, Prince Rupert; Victor Fradette, who moves from Masset to Squamish; Mel Farquhar, who left Whitehorse for a job in Ottawa in the Regulations Unit; Dick Tritschler, Port Hardy, who is resigning on May 30, seeking new employment with his vessel; Floyd McKee, who is transferring from New Westminster to Prince George; and Doug Swift, who has been promoted to the subdistrict officer job in Prince George.

* *

Wayne Knapp, Habitat Management, informs us that the Fisheries Hockey Team recently beat Victoria Fish and Wildlife (4-3 in overtime) and Envirocon Consultants (9-6) to take the trophy in a four-team round robin tournament. In other games, Chemex lost to Envirocon 6-5 and to Fish and Wildlife 6-2.

* *

Don Wilson has been officially proclaimed as Director, Field Services Branch.

Gordon Greig is moving from Victoria to Vancouver as fish quality specialist, Inspection.

* *

Sue Mosley, secretary, North Coast Divison, has resigned; Sandy Miller has joined the Department in Prince Rupert to assume the duties of this position.

* *

At the recent SEP Engineering Division meeting, Dave Narver, acting chief of fisheries for the Fish and Wildlife Branch of the B.C. Ministry of Environment , reminisced about Division Chief Al Lill's engineering achievements. According to Dave, Al was well known for his sculpin-way at Carnation Creek. Said Dave, "It was the last thing he ever built out of wood!"

* *

Pat Phillips, Administrative Services, Nanaimo, has informed us that two old friends have recently passed away. Doug MacIntyre, former fishery officer and district supervisor, passed away on April 2, 1982. Doug completed his career as district supervisor at Queen Charlotte City. He retired to Sechelt with his wife, Alma.

Harold Palmer, who lived to the grand old age of 91, passed away on April 9, 1982. "Both Jack Ellis (now retired) and I were taught by Mr. Palmer," Pat writes, "and both of us, through his teaching, made Fisheries a career."

Mr. Palmer started as a clerk-stenographer with the Department in 1923, was promoted to senior inspector in 1947 and to fishery officer in 1952. He retired in 1957.

* *

We understand that Howard Smith, senior advisor to assistant deputy minister, won a gold medal in a Molstar competition for downhill ski racing during his recent holidays in the Kootenays.

Deadline for the next Sounder is May 25.

SOUNDER

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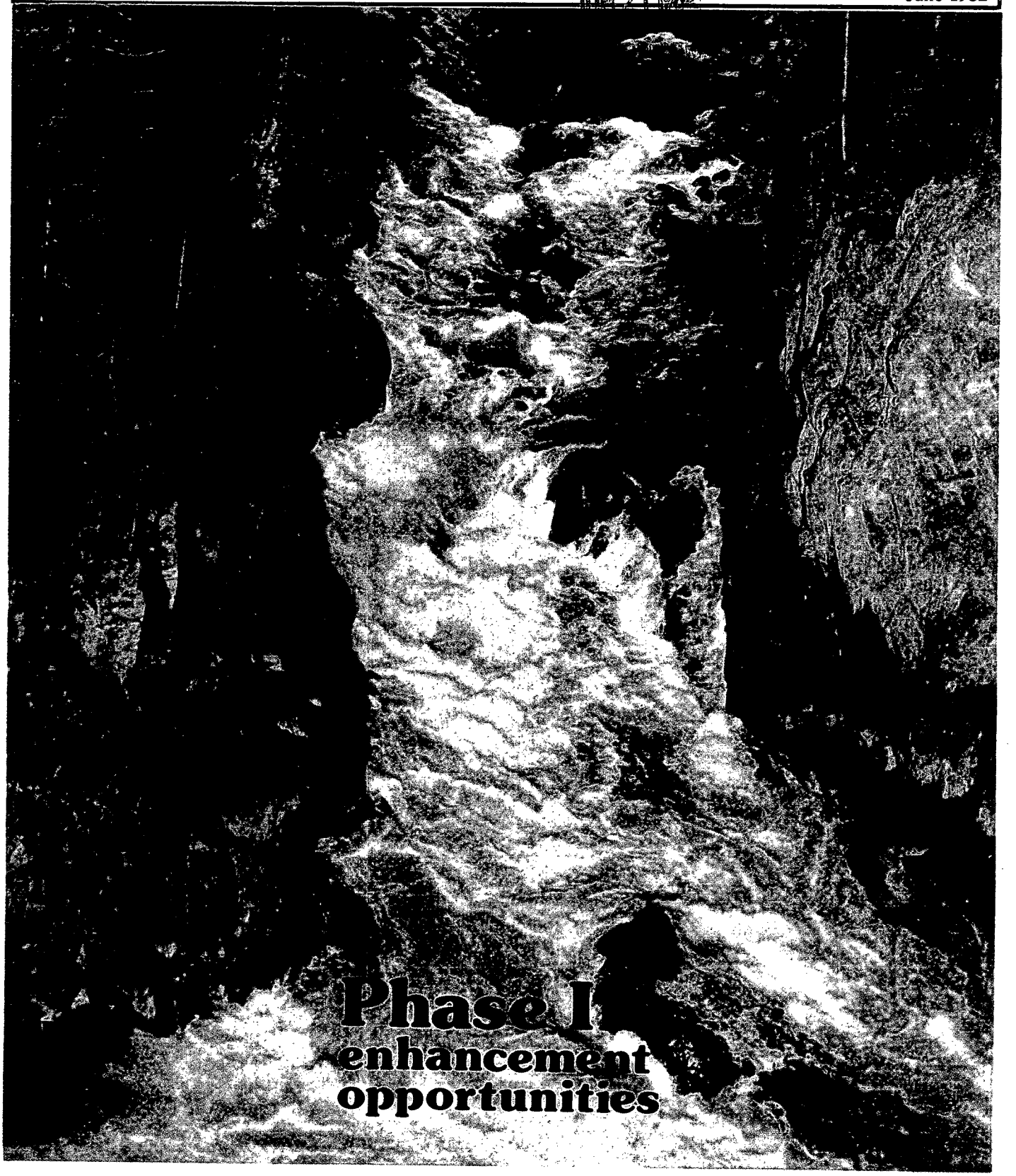
June 1982



Phase I enhancement opportunities

Prince Rupert

Good times and bad times in the north

District eight, Prince Rupert, is the featured Pacific Region district in this issue of the Sounder

Highway travellers entering Prince Rupert are still greeted with the claim that it is the halibut capital of the world; a reminder of just how quickly things have changed for the coastal community of 18,000 people.

As modest as the claim may be, it is no longer true. Halibut fishing and processing have become shadows of the former industry since 1980, when through an international treaty, Canadian halibut fishermen lost access to Alaskan waters. The sale last month of B.C. Packers' Skeena gillnet fleet, and the closing of its Prince Rupert cold storage and groundfish plants, are three more symptoms of difficult times for the north coast fishing industry.

"In 1980-81, the Prince Rupert groundfish industry had just under half of the total B.C. production," says District Supervisor Gus Jaltema, "but because of the poor market it has run into trouble. The Prince Rupert Fishermen's Co-op is just running a token industry."

This is not to say that the Prince Rupert fishing industry is dying. On the contrary, last year marked the largest catch on record of Skeena sockeye, exceeding two million fish. The herring and salmon fishing still support thousands of northerners. The processing industry still supports eight plants, among them B.C. Packers' Oceanside, which after recently expanding to eleven production lines, is the largest salmon cannery in the world. For sockeye fishing, just opening on the Nass River at the moment, and for pink fishing, 1982 should be a good year, Gus predicts. As well, the northern roe herring fleet was quite pleased with this year's catch, he adds.

District staff have their say on pages three to 13.

Cover photograph: Four-and-a-half-mile rapids on the Clearwater River in Wells Gray Park, possible site of a Phase II hatchery.

Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Fisheries and Oceans / Pêches et Océans

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Prince Rupert

On the exchange

An interview with Northern Operations Director Eric Kremer

Eric Kremer joined the Department last year, on an executive exchange, to fill the newly-created position of director of northern operations. Eric has over 30 years of experience in the fishing industry, including seven years as general manager of the Central Native Fishermen's Co-op since the cooperative was established in 1975.

What impressions did you have of Fisheries before arriving? Have they changed?

I think you get pleasantly surprised by the dedication and effort put in by both Fisheries management and Habitat management. I think that a lot of the players in industry are maybe not as aware as they should be of the role that the Department is expected to play to protect habitat and the environment.

As general manager of Central Native Fishing Co-op, how did you get an overall knowledge of Fisheries management?

Well, I think you first get a little bit leery because of lack of knowledge about the way the government operates within itself. By the same token, every once in a while you give yourself a kick and you say, "well, what the government bought on this exchange program was 30 years of fish business experience, so let's fly at her." You try and make yourself a square peg that will fit into a square hole.

Do you have any particular management strategy planned for the coming season?

No. There are lots of things you immediately become aware of. You are more concerned with the resource from the escapement standpoint rather than the catching standpoint. You become

Eric Kremer

concerned with the future. It's every bit as important as the present.

Doesn't industry have that foresight?

Well, it does, but sometimes for survival you're only concerned with year-to-year economics, particularly the economics where the bank account balances. As with a bank manager, it's now, it's the next six months and it's the next twelve months. Sometimes you get so wrapped up in the day-to-day of it, that you don't stop and consider the long term. You're probably assuming that someone else is looking after that, i.e. the fisheries managers.

Yet many in the industry believe it would be a lot better if fishermen were given more of a hand in management.

Well, I think what the fishermen want--what the users want--is more of a say in the day-to-day management of the resource. They want to be involved; they want to participate and that's the role of the advisory committees. We've been steadily attending user meetings

continued on page four

continued from page three

and getting users involved in open-door policies; talking with users continuously. We're really managing the resource in their best interests, but sometimes you have to convince people of that.

"We're really managing the resource in their best interests, but sometimes you have to convince people of that."

The impression one gets from the media, though, is that the user groups are losing faith in fisheries management. Is that true?

I think ... there's probably some truth to that. But I'm sure that there's also, equally as strong if not stronger, a feeling among regular industry participants that translates into a concern for the resource. They manage their business well. They're just as concerned that we properly look after the resource. Unfortunately, those are the people you don't hear from too often, but there is an element of those people around.

You sometimes wonder, I suppose, where we're going or how we're getting there. But, I think that if we continue to use the players' organizations and make sure that they are involved; that they participate in the meetings, then some sense of achievement will result.

What about competition between the user groups? How do you view that now you're with the government?

You probably develop a number of tunnels for viewing. One of them is the resource--the total ballpark--and the next one is where the players are going to be, and you might participate in that discussion, but you're probably not the decision maker in the final analysis. That viewpoint includes, if you like, tunnels of primary producers, secondary producers and so forth. But I think you look longer and deeper into the resource tunnel first. You've got to put the blinders on once in a while.

What is your impression of Fisheries management?

I think that the players change, or have changed, so rapidly in the Department, you get at certain times a loss of consistency. I think that is probably the most important thing that has to be re-established very quickly. The old-time role of acceptance of decisions, when the role of Fisheries management went unchallenged, is over. Now we have a whole breed of users out there who are a challenge to that authority. It means that we have to tighten up all the tools that we have to manage the fisheries with, whether it be the regulations or the laying of charges and the following up of those charges. It's almost like another degree of change that has come about since the number of players has increased so much. The Department has to address this, otherwise it makes it very difficult for everyone who is involved with the resource.

"The old-time role of acceptance of decisions, when the role of Fisheries management went unchallenged, is over."

It seems to have reached a new stage where hopefully there will be some more continuity with people and the decisions made. It looks encouraging. I think at times it's a lot bigger, and more complex role than I expected. The involvement of it.

Joining the Department in this role in Prince Rupert was probably an unexpected break in that at least it's into a fishing community and the fishing community has had fish accessible to it, both salmon and herring. It's much easier going in when you've got fish than going in when you haven't.

Skeena fishery a mixed-up case

That is, a mixed stock, mixed technology, mixed user group dilemma.

The year is 1983 and it is midsummer on the busy waters of the Skeena River, with salmon fishing at the peak of activity. Somehow optimum numbers of fish must evade nets, lines, traps and weirs to yield a new generation, and somehow the users must be satisfied. The following article shows in a hypothetical manner how these objectives might be met, all going well.

Bulletin of the Skeena River Salmon Management Committee

The following report summarizes fishery activities on the Skeena River for the week ending July 24, 1983.

The Gillnet Fishery

The Area 4 gillnet fishery was opened for two days commencing at 1800 hours on Sunday, July 17. It closed on schedule, but reopened for an additional 48-hour period on Thursday, July 21 at 1200 hours due to an abundance of sockeye. This split-opening strategy was discussed with the Skeena River Management Committee Advisory Board at their preseason meeting and it was agreed at that time that such an exploitation pattern would reduce the gillnet impact on steelhead and other faster-moving species. Sockeye catches were excellent; however, the proportion of steelhead and chinook was low compared to past years, due, at least in part, to the split opening and the restriction on gillnet hang ratios that outlaws tangle nets.

The Seine Fishery

The seine fishery occurred in ten Area 4 management units concurrently with the first gillnet opening. For the second opening, however, seines were restricted to a sockeye-only fishery that forced them to sort their catch and release all nontarget species. Although not entirely successful due to numerous violations for the retention of nontarget species, the experience and identification of areas for further technological refinement should result in much improvement next year. Sockeye catches were below past levels, but the experience in sorting could lead to a five-day per week sockeye-only fishery throughout the season, and this would improve the seine catch in future years.

The Troll Fishery

Trollers were permitted into the inner Area 4 management units for the full week, but were restricted to taking only sockeye. Their ability to concentrate on sockeye looks promising, and with the gillnet catch not likely to increase appreciably in future years, many gillnetters are putting on troll gear to more selectively harvest sockeye between net fisheries.

The Non-Tidal Fishery

A non-tidal sockeye sport fishery has been initiated on an experimental basis between the tidal boundary and Terrace. This fishery has a dual purpose of increasing the exploitation rate on sockeye while possibly redirecting

continued from page 5
effort away from depressed chinook stocks. Catches to date are poor, but it has recently been reported that a fisherman using a newly developed lure, made up of the handle of an Oneida stainless steel knife and two silk tassels, caught his limit this week. The inventor would disclose neither the pattern of the flatware nor the name of the establishment he had patronized the night before, until he had patented his discovery.

The Native Food Fishery

The weekly catch objective in the various native Indian food fisheries on the Skeena mainstem was met. Discussions to replace gillnets with traps were continued, with the native groups agreeing to design and construct a prototype under contract with the Department. The prototype will be tested in August when steelhead become more abundant.

Experimental Trap Fishery

An experimental converging throat weir-trap has been in operation since early July in one of the braided channels in the Skeena River just below Kwinitsa. Problems with debris and the rising and falling tides have been worked out. The contracted fishermen's organization seems to feel that this type of technology could provide a means to harvest a very high quality sockeye selectively while providing seasonal employment for fishermen who have chosen to opt out of the traditional commercial fishery through the buyback program.

Babine Fence

A brailing system has been installed in two of the seven fish counting traps at the fence. Spawning channel sockeye will still be surplus to escapement requirements at this point, and with the tagging information collected over the past three years, a very selective fishery on these stocks can be conducted. A local native Indian band has been contracted to do the work through a limited entry, competitive tender process. This fishery should begin around August 5 and continue for a three-week period.

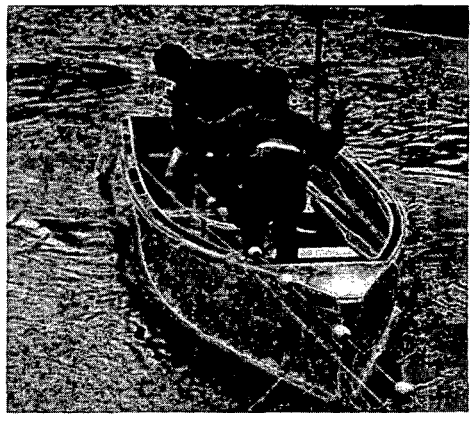
This bulletin is of course purely fictitious, but the complexity of the Skeena mixed stock problem (for example how to harvest enhanced Babine sockeye and avoid the overexploitation of other stocks) can be better appreciated when the variety of user groups and technologies are considered. The solution to these problems, in a very real sense, does not necessarily involve the elimination of less selective gear types or the maximizing of a benefit-cost ratio. The selective qualities of all users should be honed to their keenest edge and only then should long-term decisions be made concerning their roles. In the short term, however, as a phase-in period while stropping these selective qualities, some restrictions may be required.

A benefit-cost ratio is not the bottom line, as mentioned earlier, but within the range of options, given our present and near-future technologies, the variety of user groups, and the extent of the mixed stock problems. There exist a number of alternative strategies that have different benefits and costs (defined in their broadest sense) associated with time. It is the selection of an optimal strategy from these alternatives that is currently our most difficult task.

Ron Kadowaki
Management Biologist
Prince Rupert

Skeena scene

A family affair for Skeena food fishermen as they bring in the catch. Photos were taken by Willie McKenzie, Kitimat district supervisor.



Prince Rupert

New sport fish advisor contracted

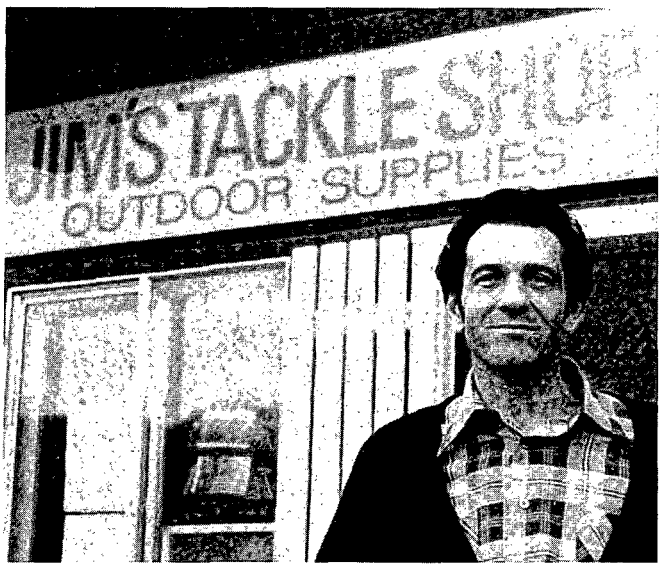
They aptly call him the Lee Straight of the north, an analogy that refers, not to Jim Culp's angling skills, but to his new responsibilities as the Department's northern recreational fishing advisor.

Jim was contracted in April to provide advice on northern recreational fisheries to the Department following a recommendation by Northern Operations Director Eric Kremer. Jim's involvement with sportfishing issues goes back to the early 1950s. As a Lower Mainland resident, he was a long-time member of the Port Coquitlam and District Rod and Gun Club and for many years he chaired the club's Coquitlam River Valley Committee, which worked to reduce conflicts between the fisheries resource and gravel operations adjacent to the river. His involvement in the conservation movement took him to the B.C. Wildlife Federation, where he was a director of the Lower Mainland zone during the 1960s. He was one of the founding members of the B.C. Steelhead Society in 1969, was president for two years and still serves as a director. He has helped set up three chapters of the society in northern B.C.

Career-wise, Jim first worked for the Department as a technician with the Fish Culture Branch in 1960. At various times, he worked at the old Nanika sockeye hatchery, Robertson Creek hatchery, as a fisheries observer at Shell Oil seismic operations on the coast and as the first employee at the West Vancouver lab when the lab still shared its site with the Great Northern Cannery. He and his wife abandoned city life several years ago and moved to Terrace where they set up a tackle shop.

Jim shares most of the views of his southern counterpart, but at times takes a different stance on specific problems and is more familiar, as a resident, with the distinct issues of the north.

"My concern as far as freshwater fishing goes is the drop in the chinook



Jim Culp in front of Terrace store

and steelhead populations," he says. "We don't have major environmental problems so far, so it has to be commercial fishing. We have to mention logging, of course, because it can be pretty devastating."

In the past two years, Babine sockeye stocks have reached record levels as a result of the enhancement efforts in the Babine system. The commercial harvest of these stocks has meant significant incidental catches of the favorite sport fish, steelhead. About 15,000 Skeena steelhead were caught in commercial nets last year.

"I'm not for eliminating the commercial fishery. I think the commercial and recreational fisheries can live together if they're prepared to sit down and resolve the problems. There has recently been a considerable response from the commercial fishing industry to find ways to overcome this problem," he adds.

He suggests shorter gillnet sets to aid in release of incidentally netted species, more closures, particularly staggered closures in commercial fisheries, to allow more "windows", and the release of steelhead that are incidentally netted.

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"They're tough fish. I've caught many with net marks."

He also proposes that seineboats be moved away from rivermouth fisheries and rivermouth traps be used for harvesting when net fisheries begin to overexploit nontarget species.

"Allow trollers to harvest more sockeye and pink and use the Babine fence to harvest newly-introduced runs of sockeye."

The residential tidal sport fishing effort is not nearly as intense in the north as it is in the south. In terms of tidal sportfishing, northerners constitute only 12 percent of the province-wide effort. Why do northerners need their own ombudsman and representative?

"It seemed like there was a gap between sport fishermen and the Department, and it may have been geographic," says Eric Kremer.

"Jim's background lends itself nicely there. In addition he's got 13 years of work experience put in with the government."

Jim cites the importance of sport angling to northern communities.

"In terms of percentages, the number of people who angle in the northwest is much greater than in the south. It averages out to be about 30 percent of the population, which is understandable because people are more outdoors-minded up here. Almost everybody you talk to seems to fish."

"With the influx of tourist anglers during the peak of river angling for chinook and steelhead, there is actually a greater amount of angling activity in a number of northwestern rivers than one would find on any southern river, with the exception of the Vedder, the Fraser and the Thompson."

Mike Youds
Editor

Native food fishing

A northern perspective

District eight contains 98,000 sq km of British Columbia's "Great White North" from Alaska to the south end of Grenville Channel on the coast, and includes the Nass and Skeena watersheds in the interior. The area is divided into three coastal and four interior subdistricts.

Within the district are 19 native Indian Bands in five tribal councils with approximately 15,000 registered members. About 600 of these members actively participate in the food fishery, taking 180,000 salmon, primarily sockeye destined for the Babine and Nass systems. This amounts to about one third of the total Indian food fish catch for the entire Pacific Region.

Therefore, it might be assumed that District eight receives about one third of the region's budget for enforcement. Wrong. Last year, when the New Westminster district officers were spending a half million dollars on helicopter patrols, not one cent was made available to district eight; not even for gear counts by fixed wing. This is not to say the Fraser effort was unnecessary. In fact, the cost-benefit ratio was very high and the patrols were a great success. The only complaint is that the effort should be spread around. This would reduce inconsistent enforcement and improve north-south relationships.

On the subject of manpower and equipment, it is as much of a problem in district eight as anywhere else. The fishery officer in Hazelton has an archaic, riverboat to conduct his Skeena River patrols.

Once fish are in the Skeena, they are protected by one fishery officer for every 80 km of river before they reach the Babine. The

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riverboat at Terrace is the only boat capable of patrolling any of this water.

Inconsistent enforcement of the Indian food fishery is another problem common to the district. Signing blanket band or individual licences, then letting the band issue them, can present the following problems.

1) The officer never meets the Indians and doesn't have the opportunity to advise them of regulations.

2) A blank licence is signed by a fishery officer, then turned over to a band for issuance. When the fishery officer signed or issued the licence, it was blank, with no name, and therefore not issued to anybody. This may present legal problems.

3) The food fish licence numbers are not known until obtained from the issuing band office. When several bands are involved, the numbers can be difficult to trace.

Although the band issuance of licences can present problems, the idea of involving the bands is good; they determine who is allowed to fish.

Marking of Indian food fish and nets is also inconsistent between subdistricts because of "local circumstances" such as isolated bands. Either all or none should be required to mark their fish.

Absolute discharges and low fines levied by the courts are of course a province-wide problem.

Another common problem has been the inability to limit participants, a problem which stems from the legal definition of "family." A county court appeal at Terrace (Regina versus Bolton) ruled that "family" be limited to persons of the same household. This may influence other court decisions.

A lot of fishery officers were in attendance at the regional meeting last November when several Ottawa staff came up with the solution to all the above problems: legalize a commercial fishery for native Indians. With 50 fishery officers swinging from the chandeliers, the observant Ottawa staff decided they should consider all the implications. How would catches be controlled and monitored? How many licences would be issued? What would commercial fishermen have to say? How would the quality of fish be monitored? What would non-native people have to say? How would legal and illegal salmon be identified?

Interior residents are constantly called upon to protect habitat for all salmon, but they are only allowed to catch coho and chinook, and fewer each year. How can they be expected to protect something that will only benefit the commercial and Indian food fisheries?

Randy Nelson
Fishery Officer
Terrace

Maximum use

A 1927 photograph shows Indian women cleaning spawned sockeye from the Babine River. The historical photograph is one in a series which was recently reproduced for the Department.

Ridley megaproject underway at Skeena's r

Ridley Island, 5 km south of Prince Rupert, has long been recognized as a potential area for large-scale port development. As early as 1968, Prince Rupert's Port Development Commission contracted C.B.A. Engineering Ltd. to study the feasibility of constructing a terminal on the 450-hectare island.

The major push to develop a terminal did not occur until the mid-1970s, when it was realized more facilities would be required for future shipment of coal, grain and other commodities from the west coast.

In late 1980, an agreement was finalized between the federal government and six prairie grain companies for the construction of an eight million bushel grain elevator and ship berthing facility. The new facility will cost in excess of $300 million.

Soon after the grain terminal go-ahead, Teck Corporation and Quintette Coal Ltd. signed a deal with Japan to supply 100 million t of coal from northeastern B.C. over 15 years, beginning in 1983. In December 1981, the final agreements were drawn up for a terminal capable of handling 12 million t of coal with a construction cost of $275 million.

In addition to these two major facilities, plans are being made for the construction of a $100 million petrochemical storage and shipping facility on Ridley Island as well as a dry bulk terminal on Ridley or at the southern tip of Kaien Island.

Construction of an 8 km access road to Ridley Island commenced in 1980. This proved to be a costly and time-consuming venture, with the road having to pass through a combination of solid rock ridges and pockets of near-bottomless muskeg.

Access to Ridley Island was gained by late 1981, at which time full-scale development commenced. At present, several contractors are involved in site clearing and preparation for the grain and coal terminals, rail bed preparations, dredging for dock construction as well as a host of other activities. To date, approximately 200 people are employed on the island, but the number is scheduled to balloon to almost 3,000 by mid-1982. Major construction should take two to three years. Activities should then slow somewhat, depending on future development agreements.

Rupert skyline is dominated by new hotel. Ridley Island lies on horizon.

A development of this magnitude is expected to have a substantial impact on Prince Rupert, though much of the activity will be shortlived. Job availability for construction workers will be good, and the local economy should get a boost from direct spending and spinoff industries associated with such a development. A housing shortage will probably be one of the more critical problems in the near future, though many of the workers will be housed in temporary camps near the site. The rental vacancy rate is near zero at this time, and hotels are receiving increased bookings.

Ridley Island is situated on the northern edge of the Skeena River estuary, an environmentally sensitive area, necessitating the involvement of the Department in the development from

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the initial planning stages. Habitat studies conducted on the Skeena estuary in the late 1960s and early 1970s were used to set guidelines for the overall development plan. Now that construction is underway, a close liaison has been established between the engineering firms and the Department, with most of the development referrals being handled on an individual basis by the Prince Rupert office. To date, most of the work has been confined to Ridley Island and has not posed any environmental problems. However, as work on the berths and loading facilities commences, on-site monitoring will increase.

Last month, the first of two dredging operations commenced to provide adequate depth for the berth structures. A large suction dredge is being utilized with a discharge capacity of 272,765 L per minute. Concerns that juvenile pink salmon migrating from the Skeena River might fall prey to the dredge led to the development of a dredge spoil monitoring program under the direction of the Habitat Management Division (see page 16) and local staff. Approximately 700,000 m^3 of material will be dredged and piped 3.2 km to a settling pond on Ridley Island.

Environmental concerns in the area will not end with completion of the project. The port development will mean a substantial increase in large ship traffic, thus increasing the possibility of marine accidents. Rail traffic along the Skeena River will also rise dramatically, and many of the materials to be transported are environmentally hazardous.

Much of the information available on the Skeena estuary and surrounding area is inadequate and outdated in some respects. An additional study will be conducted by Departmental Habitat staff this summer in order to improve on existing information.

In all, the Ridley Island port development is proving to be a very interesting and demanding project for Departmental personnel as well as for the City of Prince Rupert.

Tim Panko
Fishery Officer

Acid condition poses threat

This past winter, a bacterium called Thiobacillus ferrooxidans became part of an environmental issue in the Smithers subdistrict. Water samples from a two-year-old mine began showing startling pH levels. Run-off water passing through the mine pit measured around pH 7, but once this water filtered through a 50-metre-wide road, the pH dropped to as low as 2.3.

The mining industry refers to this phenomenon as "acid generation."

Main ingredients for acid generation are metal sulfides such as pyrite, plus water, oxygen, low pH and T. ferrooxidans. When overburden is removed, exposing the ore deposit, oxidative weathering of metal sulfides begins, and the pH drops. Somewhere

Loader prepares mine access road.

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around pH 4, the microenvironment for T. ferrooxidans production becomes very favourable, and acid generation really gets underway. The process is cumulative and can affect large surface areas very quickly unless brought under control immediately.

The acidic condition of the water helps leach out various heavy metal ions which sometimes exceed by one thousand times the acceptable drinking water standards.

A 1971 mining report addressing acid mine drainage problems stated, "once the pH of the affected portions of the tailing mass drops below 3.0, the situation is practically irreversible and treatment costs become enormous."

The mine in the Smithers area has been working diligently to contain the affected area, and so far the effects have been localized to a small portion of stream above fish-bearing water. A system of collection ditches and a pumping station divert the contaminated water from the watershed to the tailings pond. Water downstream from the collection system is returning to normal, but no one is saying the problem is licked. It is felt the acidic condition will eventually produce enough metal ions in the tailings pond to interfere with the mine's water reclamation system (for the mill's leaching system), rendering it useless.

A water treatment plant may be the only way to provide suitable reclamation water. One company that experienced similar problems in New Brunswick spent $10 million on such a plant and anticipates an annual operating cost of $800,000. Moreover, their treatment plant is expected to run many years after the mine closes. The Smithers-based mine is presently evaluating its operating options, not the least of which is environmental reclamation after abandonment.

Terry Turnbull
Fishery Officer
Smithers

Brother, can you spare some time

The sagging economy is creating hardship in many B.C. communities, making the job of SEP's six community advisors even more challenging.

Barry Peters, who this spring filled Don Lawseth's vacated position in Terrace, is impressed by the dedication of the volunteers he works with, but community fervor for enhancement is understandably suffering, he writes in his quarterly report.

The northwest is heavily dependent upon the forestry and mining industries, both victims of the worldwide recession. Financial and resource donations, contributed to SEP by industrial interests, are threatened.

"This situation makes my job all the more challenging," he notes.

"I have a tough year ahead just keeping the logging and mining companies and the ecologist talking instead of fighting."

Nonetheless, Barry has his hands full managing the nine new volunteer projects begun this season.

"It's amazing at times how easy it is to work with volunteers because you don't have the paycheque syndrome," he says.

Community Advisor Barry Peters and volunteer.

Poetic Justice

The first bright sockeye came swimming by
The local poacher had a twinkle in his eye
The Skeena run would be a record high: already customers
were calling for their fresh sockeye
Down to the Ford dealer to buy a new truck; it'd be paid
for in a month with the least bit of luck
Then he loaded his net in his shiny new boat; launched it
in the Skeena to see if it'd float
Meanwhile back in the Fisheries shack, the officers were
gearing up for a sneak attack
Out with the camouflage and spotting scope; the long
lonely watch was their only hope
Hour by hour, day by day, the undaunted officers held
their poacher at bay
The long lonely hours drifted slowly by, as one officer
sat under the starlit sky
His thoughts turned to all successful charges he'd laid
His thoughts were brief, needless to say
Then as his morale was reaching an all-time low, he
noticed the poacher was ready to go
He reached for his radio and called up the team; they were
ready to pounce and feeling real mean
They stopped the truck, all loaded with fish; a conviction
in court would be their only wish
Their work was a success, they had this turkey cold; they
charged him for all the sockeye he'd sold
When the court date finally rolled around, the poacher
had hired the finest lawyer in town
Fisheries were given some rookie lawyer, who knew less
about Fisheries than young Tom Sawyer
The poacher's lawyer was proud as could be, when the twenty
one charges were reduced to three
Then the poacher told his classic fable, as he took his place
in the witness stable
"Your honor, may I explain myself please, that net was
for my garden to string my peas
I bought those fish from a commercial plant, I was on my
way to sell them to my aunt
With that money, I would pay off my truck, now my payments
are due and I'm out of luck
And that mean officer clamped the handcuffs on too tight
my fingers got numb and turned all white"
"Enough! Enough!" was the judge's word
I'm deeply touched by the story I've heard
True justice has been severly maimed
These fishery officers should be deeply shamed"
Then he glared at them over his big, black book, "why don't
you go and catch a real crook?"
Court was dismissed as the gavel came down, the officers
slipped out the back, wearing well-earned frowns
They gazed in awe at the wide open spaces; their apprehensive
thoughts were of their next court cases.

Randy Nelson
Fishery Officer

Phase II: Enhancement Opportunities

Over the past year, a small group of SEP staff have been sifting through catalogues and assembling information from many sources in order to assess the remaining potential for enhancement projects in British Columbia. Not surprisingly, they have found that SEP has only begun to scratch the surface in most parts of the province.

To plan properly for Phase II, it is important to know the bioengineering and economic limitations of enhancement technology and the new opportunities. Accordingly, the Phase II planning committee chose to establish a group, the enhancement opportunities subcommittee, to tackle this task and report to the Salmonid Enhancement Board by May 1982. The subcommittee consists of myself and Art Tautz (provincial Fish and Wildlife Branch) as co-chairmen, with Dave Marshall (Special Projects), Bruce Shepherd (Facility Operations), Bill Schouwenburg (Planning), Brian Tutty (Habitat Protection) and Jim Wild (Engineering) as members.

We examined each subdistrict in the region in detail (usually with the invaluable assistance of local fishery officers and key Fish and Wildlife personnel) and prepared a list of potential projects which utilize any of the known enhancement technologies that can be evaluated at present. In addition, we asked the public and Department staff to send in suggestions, and we received quite a few interesting letters. Just recently, we completed a second review of project opportunities for Phase II, complete with estimates of fish production and capital operating costs. The economics group analyzed the information to determine the potential social and economic benefits for each project.

We identified 413 projects on 382 streams. Their economic performance is greatly influenced by the existence (or absence) of an international agreement.

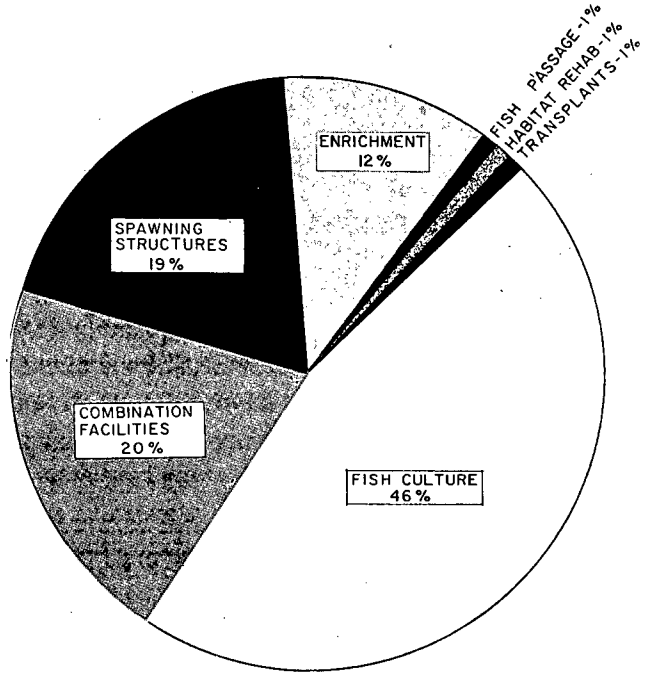
With an agreement there would be fewer projects required to reach Phase II goals as Canada would be able to take full advantage of the potential catch from most facilities.

Our preliminary findings show an exciting potential for salmonid enhancement for the next five years of SEP. It should be possible to achieve a catch of 50 million lbs. (23 million kg) from projects with a total potential in the order of 265 million lbs. (120 million kg), utilizing a comprehensive mix of technologies, species and production areas. The potential social and economic benefits are proportionately large as well.

Figures 1 and 2 illustrate the sources of this potential. Figure 1 indicates the potential by area and Figure 2 by technology. Both figures utilize as a means of comparison the percentage in weight of total potential of all projects.

Fig. 2

ENHANCEMENT OPPORTUNITIES IDENTIFIED TO DATE
TECHNOLOGY GROUPS % BY WEIGHT



TOTAL 265 M lbs.

Where Do We Go From Here?

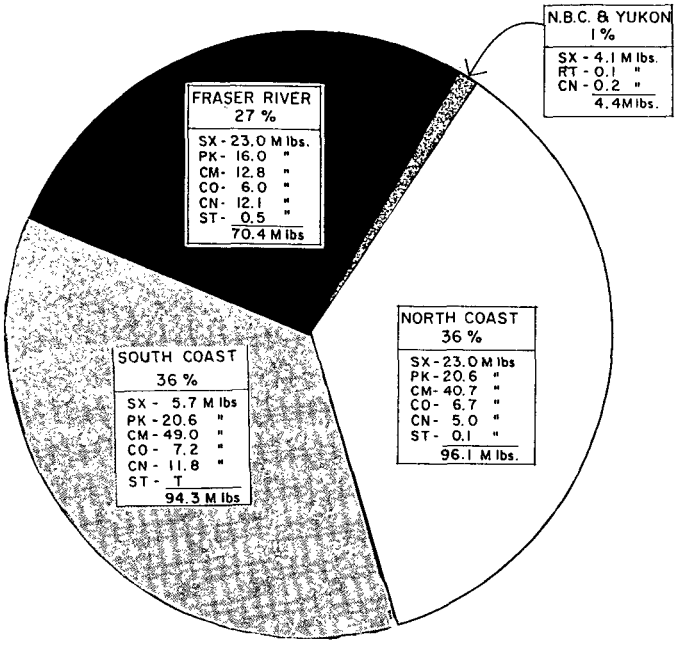
The material we are assembling is important basic information but not a plan for action.

Over the next few months, some very important steps must be taken to deal with the recommendations of the Pearse report. We are looking forward to working closely with others in the region to develop a total regional plan which will optimize the mix of enhancement; management, habitat protection, fleet rationalization and international negotiation strategies.

Fig. 1

ENHANCEMENT OPPORTUNITIES IDENTIFIED TO DATE

AREA % BY WEIGHT



TOTAL 265 M lbs.

It is vitally important that an integrated strategy be developed to meet the needs of our clients and stop the erosion of the resource. By knowing both the potential and the limitations of enhancement technology, we will be better able to plan for the future on a sound social and economic basis.

What opportunities we choose to utilize will depend on our strategy and may have little or no relation to the relative abundance of those opportunities. The subcommittee would like to see the basic inventory widely distributed and kept up-to-date as a useful tool for future planning as Department priorities and funding availability change in the future.

Al Lill
Chief
SEP Engineering

* More information on the opportunities list or on subcommittee's work is available from Al Lill.

Leavenings

Information on Fisheries Information

Chinook Information Strategy

Everyone in the Department knows that chinook stocks are in trouble and that regulations are being announced to ease this crisis.

One of the biggest problems that managers face is getting the support of commercial and sport fishermen and the general public for these stringent measures.

A communications consulting firm has been contracted to examine this problem and to recommend a public information program which would address this problem.

A report is expected by mid-June.

For more information or to offer suggestions, please call Maxine Glover 687-1442.

Habitat Newsletter

THe Habitat Management Division (HMD) of DFO is launching a quarterly newsletter called "Fish Habitat Monitor." It's aimed at professionals working in the area of habitat management (such as Fish and Wildlife Branch and Forest Service staff, foresters, agriculturists, etc.) and resource interest groups (such as SPEC, B.C. Wildlife Federation, etc.). DFO staff will also receive the newsletter. The main purpose of the newsletter is to

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inform its readers of the nature, extent and principal areas of HMD involvement.

The editor is Mike Halleran, and he welcomes your comments and suggestions. (Phone 366-4278 in Kaslo, B.C.)

Stream Care Brochure

A brightly illustrated brochure called "Stream Care" has been produced by SEP. Aimed at children, it gives some "do's and don'ts" for streams. (Example: "Do not catch small fish and move them into another stream or pond, or take them home.") It will be distributed to schools.

Copies are available by contacting the Information Branch.

DFO Newspaper Columns

The Department has embarked on a "pilot project" aimed at getting fisheries information out to the general public.

A series of twelve columns has been produced and is being offered to community newspapers in B.C. The columns (six written by DFO staff and six by contract writers), cover such topics as the roe herring fishery, enhancement projects in northern B.C., the poaching problem, and the need for conservation measures for chinook.

The column is called "The Fisheries," although it may be run without this name.

Editors will be surveyed to determine the usefulness of the column. If it is well used, consideration will be given to continuing it.

For more information, contact Franco Frittaion, A/Chief, Information at 666-1470.

False Creek Children's Fishery

For the third consecutive year, SEP and BCIT sponsored a special children's fishery May 29-31 in False Creek. This year, the Department channeled more resources into the event in an effort to increase the public's awareness of the economic and cultural importance of salmon. Special events were held to entertain as well as inform the thousands of Lower Mainlanders who turned out for the fishery. This new approach is expected to yield some specific benefits:

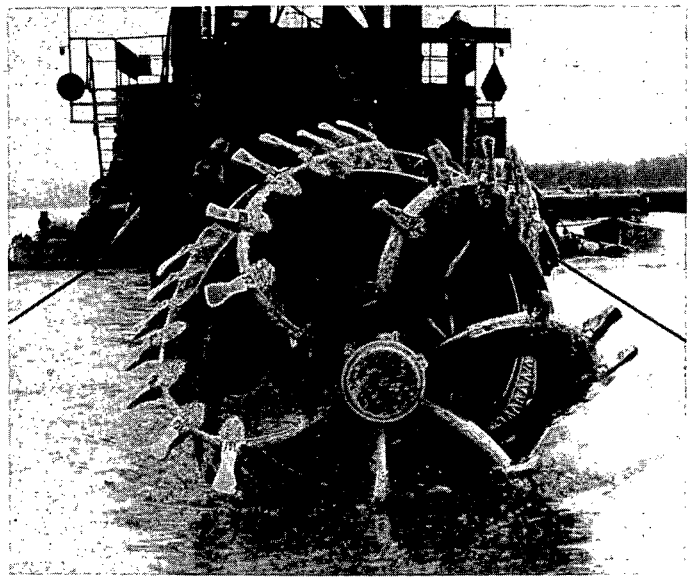
- increased awareness of DFO as a result of higher attendance;
- improved media contacts for DFO;
- increased awareness of regulations, SEP and the role of public involvement.

Maxine Glover
Editor

Death by dredge

Dredging in the Lower Fraser River has important implications for the economy of British Columbia. Dredging for channel maintenance is required to keep the deep-sea port of New Westminster open to international shipping. Dredging for sand sales and for landfill supports a large construction industry and much of the land development in the Lower Fraser Valley.

Early in 1971, fishery officers observing salmon fry stranded in dredge spoil became concerned that dredging operations could trap a significant number of juvenile salmon during the downstream migration.



Dredge cutterhead in raised position.

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The Fraser River supports a large number of all species of Pacific salmon which spawn in the mainstem upstream from Mission and in the many tributaries. Juvenile chum and pink salmon go to the sea as fry. Others such as coho, sockeye and chinook migrate to sea as smolts. All species spend a transition time in the estuary ranging from a few days to several months.

In the spring of 1972, the Department initiated a monitoring program during the downstream migration period in the Lower Fraser River.

Although monitoring was difficult, the results were startling and significant. The daily total of salmon fry captured by the dredge was estimated to be in the order of 5,000, excluding those buried in the spoil mass. The number of buried fry was considered significant in relation to the numbers found floating.

In 1973 and 1974, more sophisticated monitoring was carried out using large semipermanent screens which were designed to monitor 100 percent of the flow from the dredge spoil area. Monitoring crews were selected by the Department and paid for by the dredging companies or the Department of Public Works. The experience gained during this monitoring assisted in the development of the Fraser River dredging guidelines which were published in 1975. A criterion was established that a dredge would be closed down whenever more than 200 fry were captured for any two consecutive hours.

From 1977 through 1979, the dredging operation was examined in an attempt to reduce the number of downstream migrating fry captured. Two factors were noted.

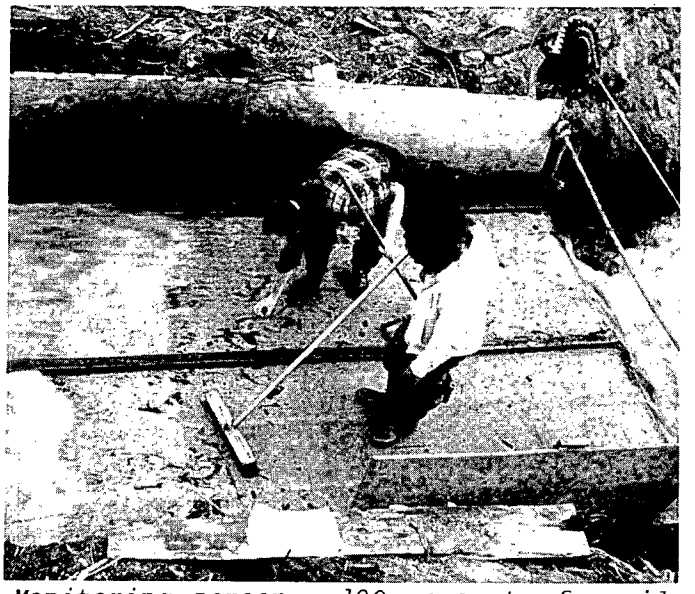
1) The unscreened surge valves which operated close to the water surface were taking in large numbers of fry.

2) The dredge pumps were started up when the cutterhead was in a raised position, and many fry were captured as the cutterhead descended through the water column to the river bottom.

New guidelines were thus introduced requesting that surge valves be screened and that dredge pumps be operated only when the cutterhead was within five feet of the bottom and the water was at least 15 feet deep. It has been shown that although pink salmon fry migrate downstream throughout the water column, chum fry migrate in the top few feet. The new guidelines have effectively reduced the chum fry captured by dredges to a negligible number. However, pink fry remain vulnerable.

During the 1982 downstream migration, four dredges were operating. All of these were monitored for 100 percent of their operational time. The preliminary data show again that chum fry capture can be avoided almost entirely but that up to 6,000 pink fry per dredge can be captured in a 16-hour operating day during the peak of the fry migration. During the 1982 fry migration period, the four dredges captured a total of 56,000 pink fry out of a total downstream migration of 550 million. The data generated in 1982 combined with that gathered in 1980 will be used over the next year to refine the existing guidelines to establish a new management system for dredging in future pink migration years.

Joe Arseneault
Land Use Unit
Habitat Management Divison



Monitoring screen: 100 percent of spoil water passes through screen.

Parasites non-pariah

Long considered objectionable organisms, parasites may actually provide the key to some of our stock management problems.

A fundamental requirement of paramount importance in domestic and international management of fisheries resources, whether they be anadromous salmon or marine species, is the need to recognize or distinguish between stocks. Mixed-stock salmon fisheries, particularly where stock composition and its dynamic changes with time are not well known, pose special problems for fishery managers.

Traditional methods of identifying stocks and determining stock composition of catches have employed tagging, marking, and the application of stock differences in age composition, scale characters, and counts of body parts (for example, fin rays or vertebrae). A lesser known approach to stock identification uses "parasite tags." (One often conceives of parasites as harmful or objectionable organisms, but in this case they serve a useful purpose.) The basis of this technique lies with the fact that different fish stocks of a single species may acquire different parasites when geographically separated, because of ecological barriers that operate on the distribution of the parasites but not on the fish. The isolation of salmon stocks during their early freshwater life provides the ideal situation for stocks to acquire unique parasites, but marine fish stocks occupying different oceanic areas may also have different parasite characteristics.

The advantages of parasite or natural biological tags over conventional tagging and marking methods are:

(1) a much larger proportion (sometimes all of the stock) may be marked naturally by a particular parasite than is possible when applying artificial tags or marks, at least for wild populations;

(2) the fish do not have to be handled to apply the tag, thus eliminating so-called "tagging mortality" and possible influences on migratory or other behaviour; and

(3) the fish need only be caught once.

Three conditions must be met to ensure the usefulness of a parasite as a tag. First, of course, the parasite must be present in one stock and absent or rare in others from which it is to be distinguished, or it must occur in markedly different numbers in the stocks to be distinguished; second, especially for highly migratory species whose stocks are initially separated but later mix, exposure to the parasite and its acquisition must occur within a limited area and time, namely, when the stocks are separated; and third, it is essential that the parasite have a long life span, preferably as long as that of its host, the fish, or at least as long as that period of the host's life over which observations on the stock are being made.

"Tagging mortality is eliminated and the fish need only be caught once."

Initial research on distinguishing among Pacific salmon stocks by parasite tags was done on a broad geographical basis in association with the mandate of the International North Pacific Fisheries Commission (INPFC). The work provided one of the bases for delineating the high-seas areas occupied by North American and Asian sockeye. Other parasite differences occur that can be used to distinguish salmon stocks on a more local level, although I emphasize that not all stocks are necessarily identifiable by the parasites they carry. During the last three years, in cooperation with Field Services personnel and with support of the Salmonid Enhancement Program (SEP), we developed the parasite-tag method for

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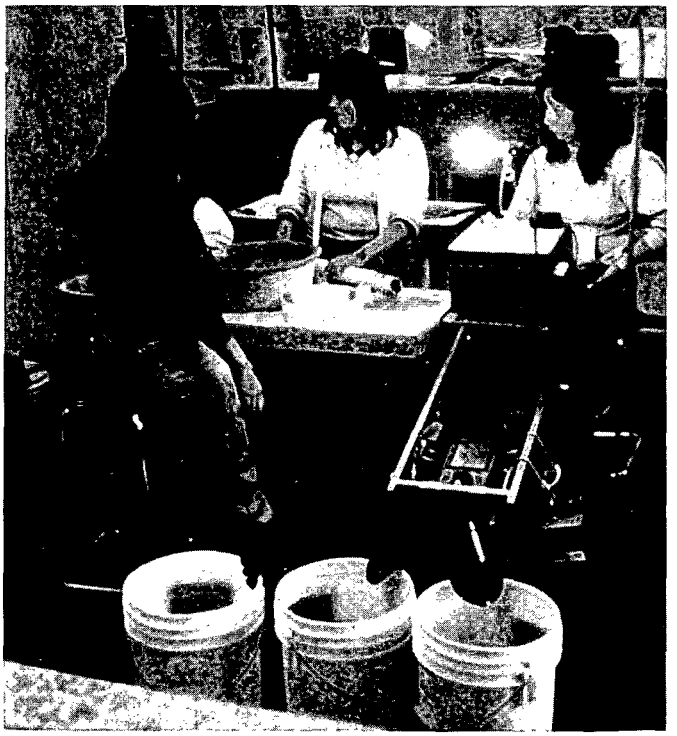
distinguishing the three sockeye stocks--Great Central, Sproat, and Henderson--that make up the Barkley Sound-Alberni Inlet sockeye fishery on the west coast of Vancouver Island. The ability to distinguish these stocks by parasite tags has been used as a tool in the management of the fishery.

We discovered that the three stocks can be separated by the occurrence of two microscopic parasites or protozoans belonging to the group known as Myxosporea. One occurs in the brain and is called Myxobolus neurobius. The other is found in the musculature and is called Henneguya salminicola. The latter forms cysts quite visible to the naked eye. For the former we have developed a rapid detection technique that makes finding the parasite a simple process. Both species are acquired in fresh water and persist throughout the life of the sockeye. Great Central Lake fish are mainly free of both parasites, Sproat fish are parasitized only by the brain parasite, and Henderson fish carry both parasites. Using the frequencies of occurrence of these two parasites in sockeye samples from the commercial fishing area, the proportions of the three stocks in the area during each week of the fishery and the contribution of each stock to the total catch for the season have been estimated. The parasite tags demonstrated changes over time in the stock composition during the commercial fishing season and revealed certain aspects of the migratory patterns of individual stocks through the Barkley Sound-Alberni Inlet area en-route to their spawning grounds. Of particular value to fisheries management is the ability to estimate on a weekly basis the stock composition from samples obtained from a test fishery 12 to 24 hours prior to each weekly opening of the commercial fishery. Adjustment in time-area closures have been based on these findings. This is the first example of the parasite-tag method for stock identification being used in the in-season management of a fishery. In summary, the parasite-tag method in this case provided information on stock composition, migration routes, and timing of runs. From the stock composition of the catch and data on escapements, rates of exploitation by stock can be calculated.



Conventional tagging methods, although useful, can result in significant mortality rates.

We have also determined that Rivers (Owikeno Lake) and Smith (Long Lake) Inlet sockeye can be separated with close to 100 percent accuracy on the basis of the brain parasite; it occurs in almost all Rivers Inlet sockeye and is virtually absent from Smith Inlet sockeye. These results have not yet been applied to identification of sockeye in the commercial fishery. Currently, we are also exploring the possibility of distinguishing Nass River sockeye stocks by parasite tags, and we are proposing to look at other salmon stock identification problems in the north.

Marine fish stocks are also receiving our attention. Recently, we concluded on the basis of parasite tags that offshore hake and Strait of Georgia hake belong to separate stocks. The offshore stocks contain two species of Kudoa (myxosporean parasites) in the muscle, whereas only one of these species occurs in Strait of Georgia hake. Further studies on hake and other marine species are currently underway or planned for the future.

Leo Margolis
Fish Health and Parasitology Section
Pacific Biological Station

Spurious emissions

Barry Ackerman was the successful candidate in a recent competition held for head, Special Programs and Management Support Unit, Offshore Division.

The newly created position of recreational fisheries coordinator has been staffed, with Bob Wowchuk being the successful person in the competition.

Steve MacFarlane has been promoted to senior project manager, Habitat Land Use Unit.

Eileen Brade has been appointed as supervisor, Licence Section.

Joining Inspection are Parin Kanani, secretary, Inspection headquarters, and Preston Chan, laboratory technician, Vancouver Laboratory.

Terence Bedard has joined North Coast Division as a biological technician.

Lois Hooge, executive assistant, executive director, SEP, has gone to Ottawa on a three to four month secondment to the Minister's Correspondence Unit; Pam MacKenzie will be acting executive assistant during her absence.

Fishery officer moves include: George Vardy, who leaves Prince Rupert for Port Hardy; Tim Panko, who stays in Prince Rupert but leaves that subdistrict for Grenville-Principe subdistict. Brian Jubinville, who is moving from Powell River to Port Alberni; John Inkpen who leaves Offshore Division for Port Hardy; and Elmer Fast who moves from Nanaimo to Whitehorse.

Write us

The Sounder is a staff publication based on staff contributions. We welcome all forms of contributions from Department staff as well as from staff of the Provincial Ministry of the Environment and other related agencies. Give us a call at 687-1442 or write to: Sounder c/o Maxine Glover, 10th floor, 1090 West Pender Street, Vancouver, B.C. V6E 2P1.

Sixty or 70 well-wishers recently bade farewell to Madeleine Holbrook.

Madeleine Holbrook retires

"It's going to give me great pleasure every morning to stick my tongue out at my alarm clock--its ruling days are over," Madeleine Holbrook told friends and associates at her recent retirement party. Madeleine, secretary to SEP Executive Director Ward Falkner, has been with the Department since 1958. Prior to her post with SEP, Madeleine worked as secretary to Blake Campbell, former Chief of Economics, for 16 years and Rod Hourston, former director of Pacific Region, for six years. Both were on hand to wish Madeleine well and to entertain 60 or 70 other well-wishers with anecdotes.

"All I can say is that I wouldn't have stayed here this long if I didn't love it," Madeleine told Sounder. "I don't think that I regret one day." Madeleine is looking forward to taking up bicycling and bowling, and catching up with her reading and knitting. Her last day with the Department was June 11.

SOUNDER

Volume X Number Five

July-August 1982

Acid rain and the Pacific Region

This is the first in a series of three articles by Jim Morrison, biologist, Habitat Management, dealing with the hazards of acid rain.

"An environmental time bomb" and "unpremeditated chemical warfare against the environment" is the description of acid rain provided in a 1980 Departmental information bulletin. The bulletin concludes that "the only area of Canada which at present appears to be unaffected by the impact of acid rain, as far as the fisheries resource is concerned, is British Columbia." It's time to rewrite the bulletin.

"Acid rain" refers to rain or snow that is more acidic than normal rainfall. Normal rainfall is somewhat acidic at pH 5.6 because of chemical reactions with carbon dioxide in the atmosphere. The pH scale runs from zero (maximum acidity) to 14 (no acidity), with a pH of 7 representing a neutral solution. Water with a pH of 6 is ten times more acidic than a neutral solution and pH 5 is 100 times more acidic. Examples of other acidic solutions are vinegar at pH 3, and lemon juice at pH 2.

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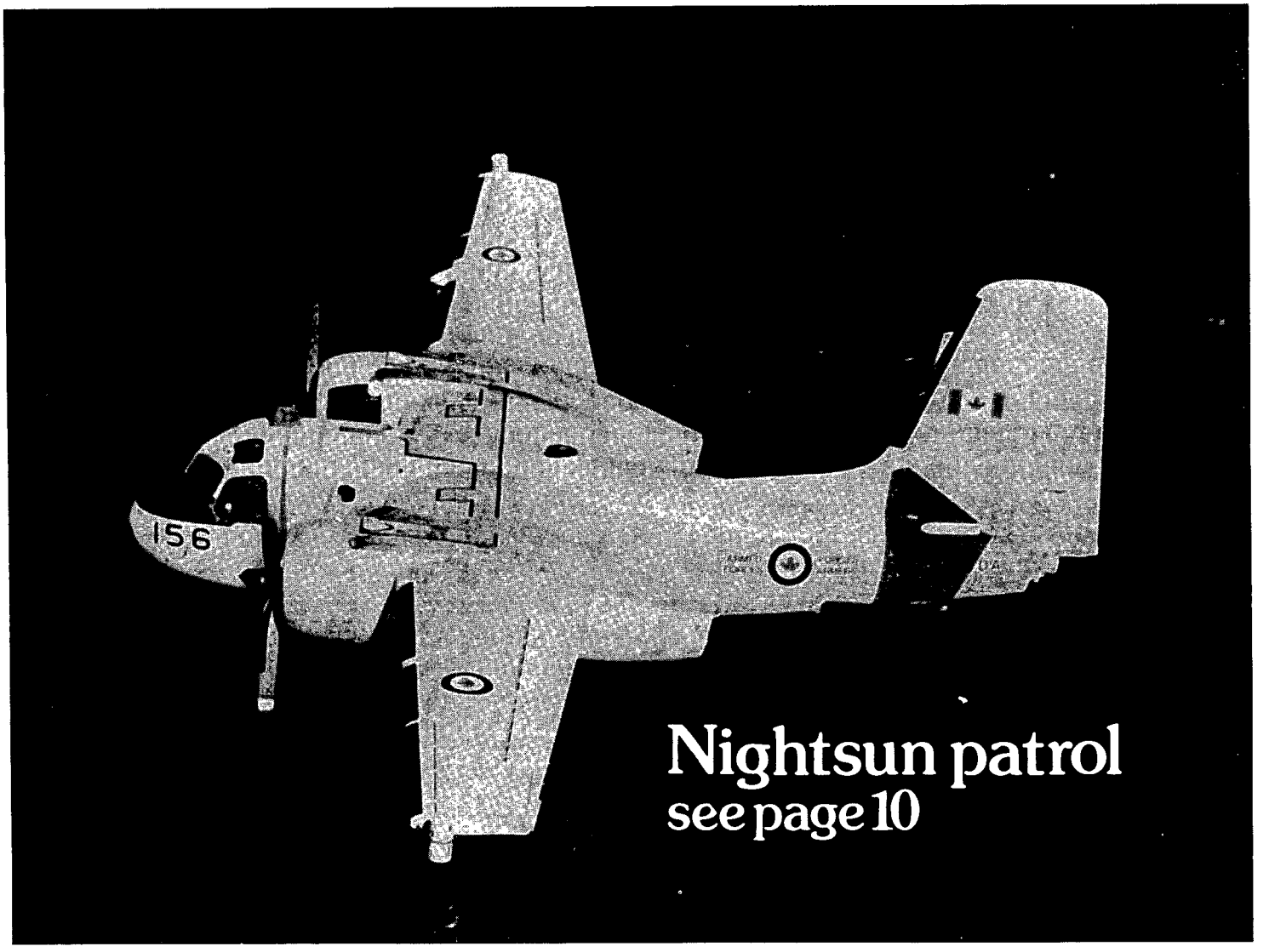

Nightsun patrol

see page 10

Letters

No SEP funding

Dear Editor:

Firstly, I would like to compliment the Sounder for the many interesting tidbits of information on the area's fishing and projects. I do not wish to be critical, as I realize that as an editor, you can only print the information you have. However, in your March issue, we noted a write-up on the project at Scott Cove and Charles Creek. Some of the information on Charles Creek is not correct. It was strictly volunteer labour and supplies, with no SEP funding.

Frances MacLeod
Box 62
Sayward, B.C.

Dear Editor:

The Sounder has evolved into a very professional newsletter over the last few years.

Since it is a staff paper, produced for the employees of Fisheries and Oceans, it has to cover topics of varied interest to us: biology, engineering, fisheries management and the ever popular "Spurious," as everyone else is always of interest to everyone else!

I do not know the publication policy of Sounder, but I am sure I am not alone in wondering why so little is said about what must concern a large number of fisheries staff. Namely, cutbacks in person years and budgets. If management is worried about leaks, should they not consider that the rumors that inevitably filter down through the system are far worse than the facts usually are? The worst policy is secrecy. People working in an atmosphere of honesty are more inclined to trust the judgement of management. They are more inclined to enjoy working!

The Sounder is the perfect vehicle for getting this kind of information across to us. Fisheries needs an open information policy. Can the Sounder get it for us?

Sincerely

Bev Bowler
Special Projects
SEP

Cover photo: Canadian Forces Tracker aircraft on marine reconnaissance mission. *See story on page 10.*

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Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Pacific Region planning: working as a whole

Although most staff either don't know of the existence of the regional planning group or are convinced that there is no such thing as planning in Fisheries, there is regional planning. For now, at least, the focus of the group is toward longer-term planning with the hope that, after a long-term direction is set, the short-term plans will fall into line.

Regional planning was formed to plan how to bring the regional activities together into a single integrated program which will, hopefully, be both better and more cost effective. In September of 1980, I was appointed by Doug Johnston, the assistant deputy minister (ADM), to head the planning group. Most of the last year has been consumed in preparation of papers for the Pearse hearings (all the papers will soon be available in the same volume). I have also been working with secondees and others to develop "the plan."

So far, the planning group is composed of me (Al Wood), a support staff of two (Jennifer Morley and Linda Jamieson) and whatever planning staff I can second from other branches. To date, Field Services secondees have been Wayne Holmes (Victoria), Paul Starr (New Westminster), Frances Dickson (Vancouver), Dave Schutz (Nanaimo), and Larry Duke (Victoria). The resource boards (for salmon, herring, groundfish and shellfish) are also a part of regional planning. Officially, the group is responsible to the ADM, but in practice it answers to the senior regional executive.

Planning tries to establish where we will be on the map of the future by identifying: (1) where we are now; (2) where we want to go; (3) how we can get there; and (4) which is the best way to get there.

Where are we now?

The resource boards and geographical working groups have provided an estimate of

continued from page 3

where we are now. The salmon resource is producing at about 40 percent of its potential (and declining by one to two percent per year). Similarly, the herring resource is producing at about 64 percent of its potential. For groundfish and shellfish, we have a mix of underutilized and overutilized stocks, although overall, both are underutilized.

Where do we want to go?

The resource boards have also proposed a set of regional goals--where we want to go. For ease of presentation I have summarized the production section of these goals (see page 5). These goals are not intended to be hard and fast; rather, they will serve as a target which will be adjusted as we move towards it. These target productions, by careful analysis, are conservative.

Because our business is fish management and production, objectives are all measurable; most, in terms of the number of fish produced or the value of catch. For example, an overall summary goal might be to produce a catch of 360,000 metric tons of fish at an average annual landed value of $650 million.

How can we get there?

How can we reach these objectives? By tapping the potential catch, of which there are two types. The first is fish that already exist. Some species and stocks are not harvested fully (not just pallid eel pouts; there may be as many as, or more than, 500,000 salmon collectively foregone each year in small, individual surpluses that can't be harvested with current management practices). As well, some salmon are foregone when fish produced by Canada are not caught by Canadian fishermen. Tapping this first category will require changes in market, gear and management capabilities. Both fisheries management and the settlement of the Canada-U.S. salmon agreement can contribute more fish to the catch; the former by seeing that surplus production of all species is utilized and the latter by ensuring that Canada receives credit for the fish which it produces, but which are currently caught by U.S. fishermen.

About 500,000 salmon are collectively foregone each year in small individual surpluses that can't be harvested with current management practises.

The second potential is fish which do not currently exist, but which could be produced. This second category can be tapped by a number of different methods. More fish can be created through combined efforts of fisheries management, habitat management, SEP and fleet rationalization. The difficulty is that none of these departmental branches, groups, or methods alone will fully rebuild stocks--in fact, unless they are all used in close coordination, the situation may become further aggravated.

Which is the best way to get there?

Very clearly, there is an urgent need for a highly integrated, cooperative program involving the organizations previously mentioned, because the success of one group is often very dependent upon the cooperation of the other. The following examples show the interdependency of these groups: SEP needs a Canada-U.S. agreement and fisheries management cooperation in order to achieve benefits from enhanced fish production; a Canada-U.S. agreement, if it is to benefit Canadians, needs SEP and fisheries

Regional goals

A Pacific regional program will be developed under the following guidelines. The program will:

- Generate a benefit-cost ratio greater than 1.0.
- Ensure fair access to the fisheries resource by the various user groups, subject to sound conservation principles and to meeting Indian fishing obligations.
- Encourage growth and stability of the fishing industry in small, coastal communities.
- Encourage growth and stability of the Indian peoples' fisheries-related income and employment.
- Adjust the employment generated by the fisheries resources consistent with the maximum long-run profitability of the fishery.
- Conserve, rehabilitate and enhance fish stocks and their habitats.
- Provide a direct return to the owners of the resource, the people of Canada.

Proposed temporary goals (in metric tons) — Pacific Region

Goals	salmon	herring	groundfish	shellfish
To maintain current annual catch of fish from existing production by stock and habitat management	64K* (23M pcs.)	45K	62K	10K*
To increase catch from natural production by rehabilitation of stocks and habitat	23K (8M pcs.)	TBA	11K	TBA
To increase annual catch by enhancement	68K (25M pcs.)	Pilot test	Pilot test	8K
To increase annual catch by altering harvest practices and using under-utilized stocks	9K	25K	20K	10K
To increase landed value from 1980 at -	$160M	$35M	$20M	$11M
to the year 2020 (in 1980 $'s) at -	$400M	$150M	TBA	$53M
To reduce fishing costs by	X%	Y%	Z%	S%
To increase cost effectiveness of government programs by	25%	25%	25%	25%

* includes catch from current cultured production.

management; fisheries management needs SEP, a Canada-U.S. agreement, and habitat management to rehabilitate key stocks; and Habitat management needs fisheries management to deliver existing fish and SEP to rehabilitate stocks. Therefore, numerous other branches within the Department are also included in the planning work currently underway. Articles from the various branches, featuring their role within the planning group, will be forthcoming in succeeding issues of Sounder.

I am trying to bring this plan together by October 1982. The intent is to take an overview plan to Cabinet to seek approval (and funding) to prepare more detailed plans and schedules. These in turn will be submitted in order to get the funding and changes to legislation required to implement a program to achieve regional goals.

Prospects

Under current economic conditions, I am not wildly optimistic about being able to obtain Cabinet approval and funding. However, the fisheries represent a renewable food resource which has great potential and which, I am certain, offers the federal government one of its best long-term economic investments. If major funding increases are not forthcoming, we can still do much with even a small increment and with what we now have. On the positive side, a Canada-U.S. salmon agreement is within reach; a major effort is being made to rationalize habitat management; a Pearse Commission final report is due, with major recommendations; and SEP Phase II is now being developed.

If major funding increases are not forthcoming, we can still do much with even a small increment and with what we now have.

That, basically, is an overview of the regional planning group--its functions, its current objectives, and its goals for the future. You might say that it's the "Grand Plan"--we're all a part of it, whether we know it or not, whether it affects us directly or not. If you have any suggestions on positive changes, actions, or funding sources, I'd welcome your comments. Please don't hesitate to write me at headquarters in Vancouver, or to phone me at 666-3855.

Al Wood, Director
Regional Planning

Human Resources Program expanded

Pacific and Freshwater Fisheries has decided to expand the Human Resource Management Program initiated in 1981.

The program provides, for all managers, mandatory training appropriate to their level in the organization. Over 400 managers received training in 1981-82. The training provided upgrading of basic skills in the areas of interpersonal communication; leadership styles and the role of the manager; problem solving; stress and change; organizing, planning and decision-making; motivation; on-the-job training; current models of human behavior; the nature of conflict, and situational leadership.

Because of the positive response to the training, it was decided to continue the seminars for who were able to attend in 1981-82 and for those recently appointed managers.

The PFF Human Resources Management Program identifies employees of high potential for development as future managers. One strategy, entitled the management development plan, was initiated last year. This plan is being further developed, in conjunction with proposed succession planning exercises, to promote development and training opportunities for employees who demonstrate potential and interest for management work.

The Human Resources Management Program is actively involved in development of the fishery officer career plan, which is scheduled for implementation in 1983. It is also investigating performance measurement techniques to measure results of its initiatives to assist the organization and its employees in operating to their full potential.

Fred Iviney
Project Manager
Human Resources Management Program

Fishery officers register their priorities

Fourteen representative fishery officers from across Canada were recently provided with an opportunity to take their concerns and complaints straight to senior Departmental management in Ottawa. The three Pacific Region officers who participated, John Stevens, John Greenlee and Byril Kurtz, have provided Sounder with a summary of the information exchange.

Earlier this year, Deputy Minister Don Tansley requested that the working level fishery officers across Canada meet with senior management to review the roles fishery officers and their co-workers play in management of the different fisheries, and to hear firsthand problems and concerns common across the country. The meeting was set up by Bud Bagnell, director, national enforcement, with 14 fishery officers attending from the different regions across Canada.

The following points of concern were common to all regional representatives and are listed in order of importance.

1) Policies There should be a consistent and credible approach to fisheries management.

2) Staff Administrative details should be handled by clerical staff to provide fishery officers more time to deal with operational responsibilities. This would also increase staff mobility during peak workload periods.

3) Training Recruitment in-service and language training should be made available.

4) Equipment Equipment must be suited to local needs. Radio communications should be improved.

5) Seasonal Personnel These staff members should be rewarded more fairly for the direct value they contribute to the management of the resource.

6) Enforcement The Fisheries Act and Regulations are the judicial responsibility of the Department, and not user groups. Managers should be discouraged from making politically expedient decisions affecting enforcement situations.

7) Communications Information on impending fisheries management decisions should be sent directly to the field staff prior to being released to industry.

8) Resource management More precise stock assessments and more fishery officer input are required.

9) Legal service Crown prosecutors should be provided. More appropriately designed regulations are required.

10) Transfer policy National and regional transfers should be permitted.

11) Acting positions These impede progress and create inefficient management.

Fishery officers gave slide presentations of their roles, duties and responsibilites within their respective areas. After the presentations we had a short, unexpected visit from the Minister of Fisheries, Romeo LeBlanc. The Minister briefly outlined the direction the Department is headed. Because our decisions affect industry so directly, we must have their involvement in the decision making process, he said. We next presented our areas of concern to senior management. While time did not allow full discussion on each point, the points were received well and were to be followed up. John Stevens completed the session with comments on poor morale within the Department; a result of a combination of the eleven points of concern. Meaningful changes must be made to alleviate the problem, he said.

Pacific Region's 140 fishery officers are spread thinly across a massive area. They face an immense task.

The fishery officers also had the pleasure to present Don Tansley (who is retiring) with an official copy of the new Fisheries emblem bearing the Queen's signature of approval.

John Greenlee, Fishery Officer, Bella Coola
John Stevens, Fishery Officer, Sooke
Byril Kurtz, Fishery Officer, Salmon Arm

Acid rain and the Pacific Region

Part one: closer to home

continued from page 1

Combustion provides the precursors for acid rain, releasing sulphur dioxide and nitrogen oxides. Volcanoes and geothermal vents are natural sources. Man-made sources include thermal power plants, mineral ore processing, and industrial operations that burn fossil fuels for energy. Vehicle emissions are a major source of nitrogen oxides in urban areas.

In the atmosphere, sulphur dioxide and nitrogen oxides can be transported for long distances. In the east it is believed that American sources account for more than 50 percent of the acid rain falling in Ontario. On the west coast, a Washington state resident filed a claim in 1926 for smoke damage to fruit crops, attributed to emissions from the Cominco Ltd. lead zinc smelter at Trail, British Columbia. In operation since 1874, the smelter's firest "tall stack" was built in 1925 to remove smoke from the townsite.

In the atmosphere, sulphuric and nitric acids form from the oxide precursors in the presence of moisture, sunlight, and other pollutants. Alternately, the oxides can also be "dry-deposited" on the ground or on vegetation, forming acids when moisture becomes available. Approximately 312 g of sulphuric acid rains down on every acre of southern Ontario each year, while 20 kg are deposited in a dry form on each acre. Acid deposited in the winter can concentrate in the lower levels of the snowpack, to be released in a matter of days during the spring melt.

What are the effects of acid rain on human health? Acid precursors in the atmosphere are suspected to have serious implications for human health. Sulphate particles irritate bronchial tubes and alveoli leading to chronic bronchitis or emphysema. Histamines are released, which trigger asthma attacks. Nitrogen oxides damage lung cells, resulting in edema.

Other acid rain effects include contamination of water supplies by metals mobilized as a result of increased acidity and reductions in forest productivity by ten to twenty percent or greater. Agricultural soils and crops may be damaged. Building materials deteriorate, and it is now suspected that up to

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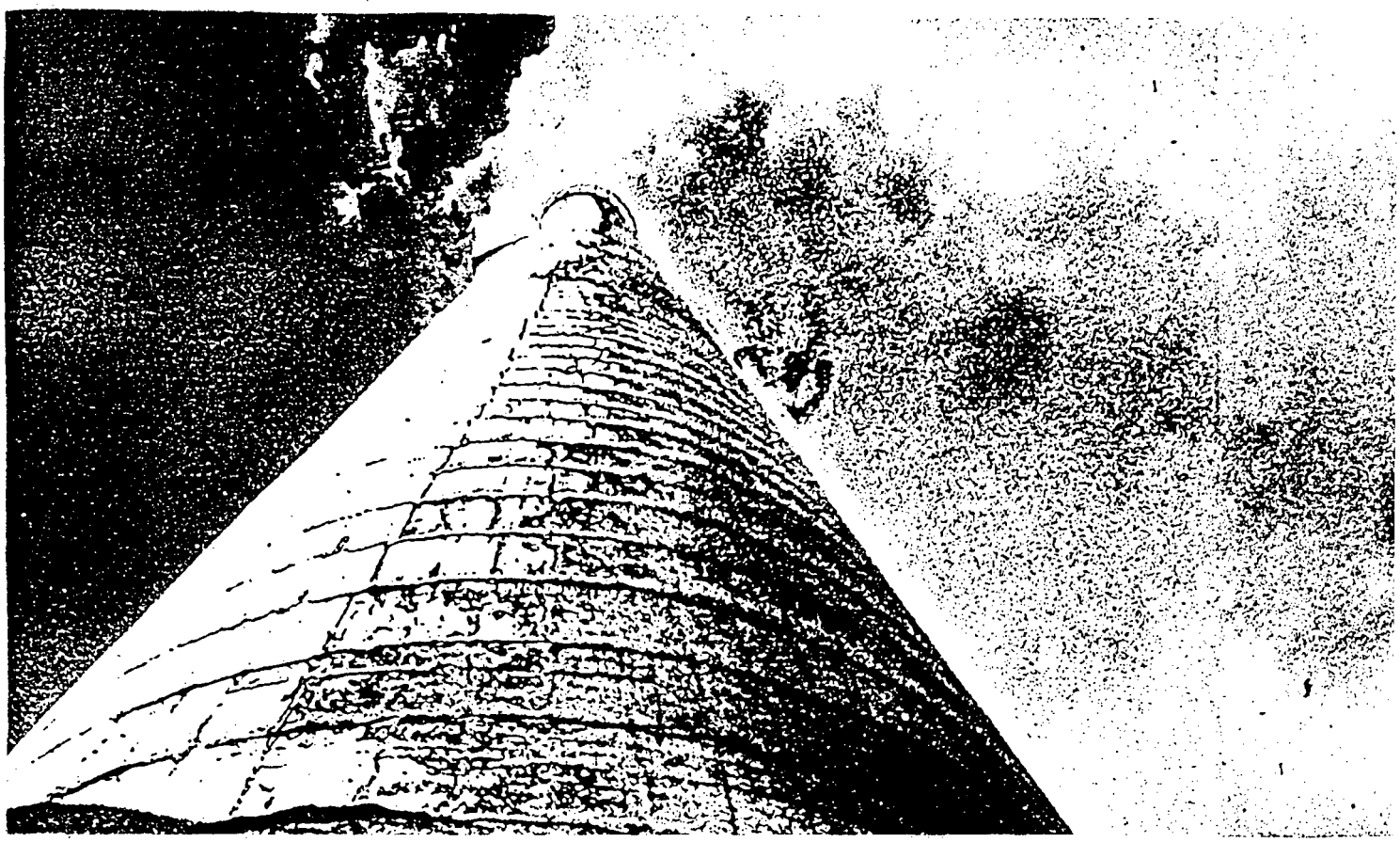


50 percent of automobile corrosion in the east may be attributable to acid rain. The next time you're in a new vehicle, check the owner's manual for the statement disclaiming responsibility for the effects of "chemical depositions."

The effects of acid rain on fish-bearing watercourses depend on various factors, including the initial acidity of the precipitation, the modifying effects of vegetation and organic compounds in the soil, and the buffering capacity of the soils and the receiving waters. Buffering capacity is measured by alkalinity, which includes the dissolved carbonate and bicarbonate ions that neutralize acids in solution. Bicarbonates are released by weathering processes. When acid loadings deplete the available carbonates, the pH begins to drop. This effect is enhanced in the spring, when acid released from the snowpack results in a sudden pH depression, a phenomenon termed "acid shock-loading."

But what happens when the pH of stream systems is reduced? The International Pacific Salmon Fisheries Commission and other west coast researchers have begun investigations of the effects of acidification on Pacific coast salmonids. However, the majority of the available information comes to us from eastern Canada, the United States and Scandinavia.

Habitat Management Branch and the International Pacific Salmon Fisheries Commission, extend their thanks to the other groups and individuals who have helped the acid rain monitoring program through the preceding year:

- fishery officers Frank Voysey, Byril Kurtz, and Joe Chambers, for their assistance in sampling through the spring snow melt;

- fishery officers Pat Harvey, for his offers of assistance when the field vehicle was put out of commission by the logging truck;

- the Kamloops district office, Grant Scott and his staff, who supported our efforts in the district;

- the officers of Queen Charlotte City and Prince Rupert, for their assistance in the recent north coast sampling trip;

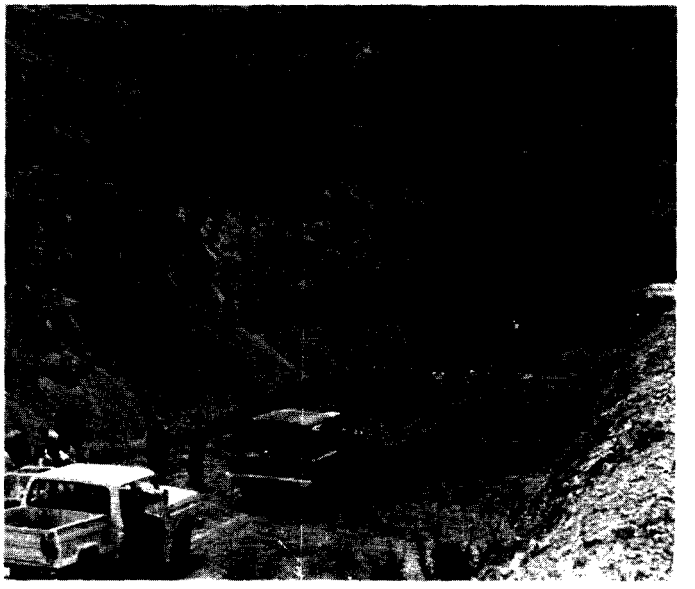
- the West Van lab staff, for their patience and their analysis of the water samples.

The survival and hatching success of brook and rainbow trout eggs decline below a pH of 6.5. As the pH is further reduced, embryos are deformed, alevin mortality increases and newly emerged fry may refuse to eat. Ion exchange at the body surface or through the gills is disrupted. Calcium is dissolved from bone structures. Juvenile salmonid growth is reduced, and eggs may fail to mature in adult females.

Other aquatic organisms also affected. Plankton populations in lakes are reduced, and mayflies or stoneflies in streams disappear below a pH of 6. Crayfish, snails and clams decrease below a pH of 5.5.

Not all of these effects are directly attributable to increased acidity. As pH levels decline, toxic metals such as mercury, lead, copper, zinc and nickel may be mobilized in soils and watercourses. As well, an aluminum hydroxide buffering system is activated below pH 5. Neutralization of incoming acids by the hydroxide releases highly toxic aluminum ions. In some systems of the Adirondacks, researchers have suggested there is enough aluminum released to be seen as a silver sheen on the water.

Jim Morrison
Biologist
Water Quality Unit



A group of Fisheries staff tour the site of the proposed Hat Creek thermoelectric generating plant. In the next issue of Sounder, Jim Morrison discusses the acid rain effects produced by similar developments across Canada.

Fly-by-night

Aircraft offers advanced enforcement

Fishery Officer Lyle Freeman was involved in late June with the first use by the Department of a Canadian Forces Tracker aircraft for the night patrol of inshore fisheries. Through the use of a surveillance system called "Nightsun", many of the familiar problems of fisheries enforcement were overcome. In the following account, Lyle outlines his experience.

As instructed, I carried out a night patrol via Canadian Forces Tracker aircraft from VU 33 Squadron at CFB Comox.

We were airborne at 2300 hours and flew over the Beaufort Range, across Kennedy Lake and over Tofino. We then followed the coastline down to Amphitrite Point and proceeded down Loudoun Channel to the outer gillnet boundary in Sechart Channel at Howard Point.

We carried out an airborne night patrol of the seaward gillnet boundary and investigated all radar targets of a suspicious nature. This was a combined operation between the Tracker and "FPV Comox Post." We then proceeded, at the request of the "Comox Post," to investigate suspected illegal gillnet operations in Pachena Bay, southwest of Cape Beale.

Although we acquired six radar targets near the entrance to Pachena Bay, ground fog was so thick that the night arc-light could not penetrate the fog sufficiently to identify the gear type of the vessels accurately. The aircraft then returned to Barkley Sound and did another fly-over and radar search of the gillnet boundary area. We left the operational area at approximately 0115 hours, returned to CFB Comox and carried out some night instrument flight operations, landing at approximately 0230 hours. We then recounted our operation and made individual observations about the exercise.

I feel the Tracker aircraft, and in particular the flight crews of VU 33 Squadron, present an opportunity to reduce dramatically the illegal activities of the inshore domestic fisheries, particularly the salmon net fishery. The aircraft, crew and surveillance and detection equipment are far superior to anything presently used to patrol the inshore fisheries. The aircraft is a medium-sized, multi-engine, antisubmarine aircraft capable of about seven hours of flight. The crew are professional, highly skilled pilots and flight crew. (The Tracker carries a pilot, copilot, navigator and radar operator.) The main detection equipment includes radar, 70 million candlepower arc-light, two sophisticated cameras, and high-intensity parachute flares. In addition, the aircraft carries highly versatile radio equipment and radio navigational aids and is fully instrument-rated.

Weather and flying conditions were excellent during my patrol, and the ease with which we were able to navigate, detect, and observe a net-fishing fleet up close in coastal waters was truly impressive, considering it was the middle of the night. The aircraft was easily able to communicate and work in partnership with the "Comox Post." Once we had acquired a radar target, we had no trouble determining vessel type, gear type and other information. We were able to maintain visual and radar surveillance continuously due to the manoeuvrability of the aircraft and lighting equipment. The value of night patrols throughout the coast, in such areas as San Juan, Johnstone Strait, Nass-Skeena, Milbanke Sound and the Charlottes, can be appreciated. There are many other fisheries when boundary and closed-area patrols would be very effectively patrolled by this aircraft.

There are some noteworthy drawbacks. Even with the Tracker's sophisticated equipment, poor weather conditions can restrict or eliminate its effectiveness. The configuration of the aircraft makes the fishery officer's seat almost totally useless for visual observation. (This can be corrected partially, according to the crew.) The engines of the Tracker are very powerful and can be heard for quite a distance, although manipulating engine power and reducing flying speed can reduce the noise.

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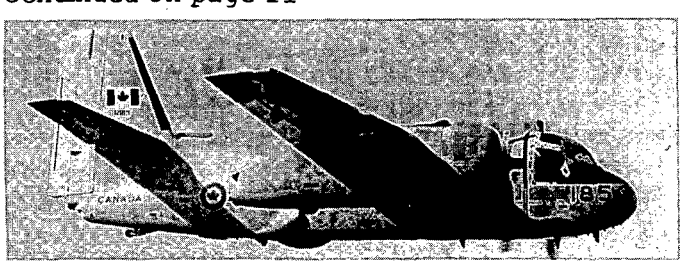

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The other major question unanswered in my mind is the increased role of the military in domestic fisheries enforcement, and the adverse reaction and subsequent political involvement that may arise. Present operations of the aircraft do not include patrols of domestic inshore fisheries.

I would stress, however, that if we truly wish to reduce illegal fishing without substantially increasing enforcement staff and surface equipment, we have a golden opportunity with the use of the Tracker aircraft.

Lyle Freeman
Fishery Officer
Comox

Motherwell and the Seaplane Division

Major Motherwell Daclares It Is Most Effective Fisheries Curb.

OFFENDERS EASILY SPOTTED FROM AIR

There was never a finer enforcement tool than the Boeing flying boats used to patrol West Coast fisheries during the 1920s and 1930s.

Under the guidance of Major J.A. Motherwell, chief supervisor of Pacific Coast Fisheries for many years, the aircraft made their debut in 1924. Often piloted by fishery officers, the planes gave the Fisheries Service a new-found advantage of surprise over fishermen who took a chance on illegal fishing. For a period of about ten years the Seaplane Division became the cutting edge for a seagoing patrol fleet comprising as many as 120 vessels.

Larry Duke, district six supervisor, recently sent Sounder a 1937 Province newspaper clipping, which states:

"Major Motherwell declares that the moral effect of the patrol is most important. It strikes terror into the hearts of lawbreakers because they never know when a plane will appear out of the blue."

Province-wise

Pen rearing speeds up life cycle

The future of lakepen rearing of steelhead trout is promising and is beginning to create better angling opportunities for steelhead fishermen in some of British Columbia's rivers.

In 1978, a SEP research project was initiated to test the feasibility of raising steelhead trout from fry to smolts in large, floating net enclosures in lakes. This project is one of five SEP-funded research projects conducted on the Keogh River since 1976 to examine the wild steelhead trout population and test the feasibility of various enhancement techniques. The net technique shows promise, as substantial numbers of the pen-reared smolts have returned as adults to the Keogh River to spawn this spring. O'Connor Lake, which drains into the Keogh River near Port Hardy, was chosen as a suitable site for lake pens, since it met the physical requirements necessary to raise steelhead (maximum water temperature 20°C, oxygen 8ppm). Also, the existing fish-counting fence located near the mouth of the river was available to monitor both smolt migration and returning adults.

Eggs are taken from adult steelhead in the spring, then fertilized and incubated in a small hatchery facility on the river. The fry emerge, are reared in troughs in the hatchery and fed until they weigh 1.5 grams. By June they are ready to be placed in large net enclosures in the lake. The fish are fed automatically at regular intervals throughout the day and grow rapidly during the warm summer months. Growth slows down in winter, but picks up rapidly again the following spring. By May the fish are silver bright smolts and ready to migrate to the ocean. The entire process has taken one year, in contrast to the "wild" situation where steelhead smolts require two or three years to reach smolt size.

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Results have shown that rearing steelhead fry in net pens can produce, in one year, smolts that average 60 to 80 g, which is as good as or better than hatchery-raised smolts. The supreme test is to see if the smolts return in significant numbers as adults. This year's results suggest they do. Recent tallies of adults moving through the counting fence indicate that 400 two-year ocean fish have returned from a release of 13,500 smolts in 1980. In addition, 160 three-year ocean fish have returned from a pilot release of 3,100 smolts in 1979. Survival of these three-year ocean fish (1978 year class) is over 5 percent, which is 1 percent above the biostandard used for steelhead enhancement planning by SEP.

Next year, all age classes of the 1980 smolt release will have returned and completed the life cycle, making it possible to compute the total apparent marine survival of this group.

Despite some unanswered questions, there is positive support for this method of rearing steelhead. It has several advantages over the conventional hatchery method of producing smolts—reduced cost of facilities, improved smolt quality, more efficient use of hatchery space (from egg to 1.5 g fry) and a semi-natural environment.

As a result of the early Keogh work, similar projects have been undertaken to enhance winter-run steelhead stocks in the Cowichan and Vedder Rivers. Also, summer-run steelhead will be reestablished in the Campbell River this spring using smolts from Tsitika River stock reared in pens at O'Connor Lake (12,000 in 1982, 30,000 in 1983). In 1983, 15,000 smolts for the Quatse River will be produced at O'Connor. The technique is also being considered for the giant Gerrard rainbow in Kootenay Lake.

Sue Billings, Biologist
B.C. Fish and Wildlife Branch
Victoria

Lake enrichment gets its due

Research staff working on the lake enrichment program were surprised and elated last month when sockeye returns to Hobiton Lake exceeded, by five times, the expected escapement.

"We were predicting between 8 and 12,000 returning," says John Stockner, associate director of the Resource Services Branch. "What's come back, as of Friday (July 9), is a total of 59,000. When all is said and done, it will be closer to 70,000 fish."

Under the lake enrichment program, selected lakes are aerially fertilized to stimulate the growth of plankton. The Hobiton sockeye returns show a survival rate of 15 to 20 percent, almost close to a record for ocean survival of anadromous fish. Only two lakes, one in the Soviet Union and one in Alaska, have higher ocean survival rates. What lies behind the success at Hobiton Lake?

"You can only speculate that the larger size of outgoing smolts must affect survival. There's all kinds of conjecture," John says.

"The real excitement of the story is that this is the same thing that happened at Great Central Lake. When fertilization started there, there were striking returns. The run built up gradually to between 400 and 600,000. But the results of fertilization were often confounded because of the imprecise early measurements and the commercial fishery and the fishway. There were lots of critics who said the run was on its way back anyway."

"That's the excitement of Hobiton: a small subsistence Indian food fishery on the river and a total escapement of 6-8,000 sockeye. We started fertilizing Hobiton in 1977. It's above Nitinat Lake; small, easily controlled. We're seeing the return of two treated brood years. There's been no commercial fishery, no logging, no mining. And what we've seen is a size increase in the smolts leaving the lake and a remarkable increase in adult returns."

With the 1982 returns to Hobiton Lake, enrichment staff have evidence that demonstrates the effectiveness of the ten-year-old experimental process. They are

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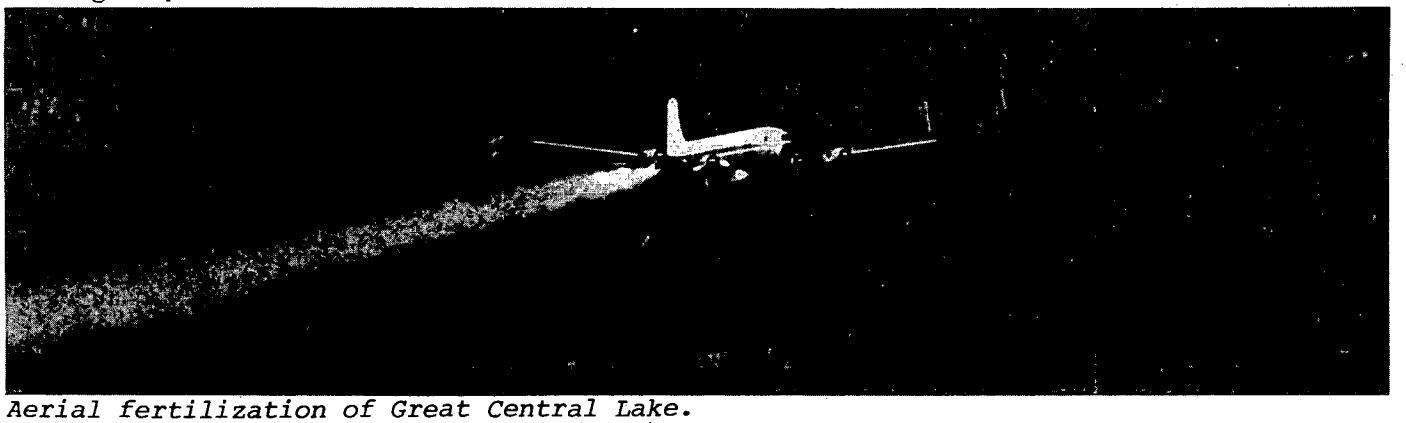
now anxiously awaiting returns to several other lakes where lake enrichment has substantially increased the size of the outgoing smolts in earlier years. John sees this as an important development for the program, but maintains that lake enrichment will remain experimental in nature for some time yet.

"We're still five to seven years away from making it operational.

"The danger is to extrapolate [from the results at Hobiton]. Lakes are like people; they're quite separate and unique; they have their own flora and fauna. We can't expect to apply one standard to all our lakes. We must continue to increase our research efforts."

Mike Youds
Sounder Editor



Aerial fertilization of Great Central Lake.

What you can expect

by Pat Phillips

I haven't been practicing what I preach, hence 2 issues of the Sounder have been printed since this column last appeared. For those who have missed me--thanks.

There has been a slight change in the policy of accounting for travel advances. All advances must be fully accounted for within 15 days after the completion of a trip. I have been advised, however, that when an employee submits his/her claim to cover the advance and the claim does not clear the amount of the advance, he/she must clear the advance by:

a) a cheque to cover the difference; or

b) a claim submitted at the same time, for another trip, which is sufficiently large enough to cover the outstanding amount of the advance.

In the latter case, the two claims are treated as a package and are applied to clear the advance. The statement "another claim to follow" will not qualify as an advance-clearing settlement.

The claims that are required to clear the outstanding advance must reach the claims audit desk at the same time to qualify for a "package" clearance of the advance and must be received within the accountable period that pertains to the advance in question.

With the advance cheque, you receive a copy of the Travel Authority and Advance form containing the accountable date. It is important to note the date by which you must account for your advance.

Submissions of travel claims seem to be such a chore, and by the looks of those being returned for correction from Finance's audit, some of you are not taking a little time to do it right.

Each and every office should have a Support Services circular manual, and if in doubt, employees should refer to it. The circulars are written clearly and concisely. If your office doesn't have a manual, phone Gillian Trushel in Vancouver at 666-3284 or Ted Hoover at 666-1986, and request one.

Be warned! The Vehicle Acquisition Plan for 1983 is going to have to be prepared on time. I certainly hope that the forms and instructions will be available in plenty of time for us to submit them on time.

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Do you check your paycheque stubs occasionally? Are the deductions made from the cheque correct? Do you know what the deductions are? If you receive an increment, do you check to see if your annual salary is correct; that your gross salary multiplied by 26.088 equals the annual rate? Are you aware that your cheques are now broken down to twice monthly pay? You should be answering "yes" to all the above questions, and if you're not sure, then make sure. Your pay and benefits clerk has your answers; give her a friendly call to clarify any questionable items.

Leavenings

A column of information about Fisheries information

Children's fishery evaluation

This year the children's fishery at False Creek was evaluated from a public relations perspective. For the first time in its three-year history, the event was used as a means to tell the general public about some of DFO's activities and to inform them about the value of the salmonid resource in the social, aesthetic and economic senses.

In a nutshell, the effort was deemed worthwhile for the money spent (slightly more than $16,000). Media coverage of the event was both positive and extensive. The special events (fish boat tours, native dancing, cooking demonstrations) and display helped to emphasize the importance of salmon in many parts of our lives. The Department gained some valuable experience in how to make the most of a "good news" event.

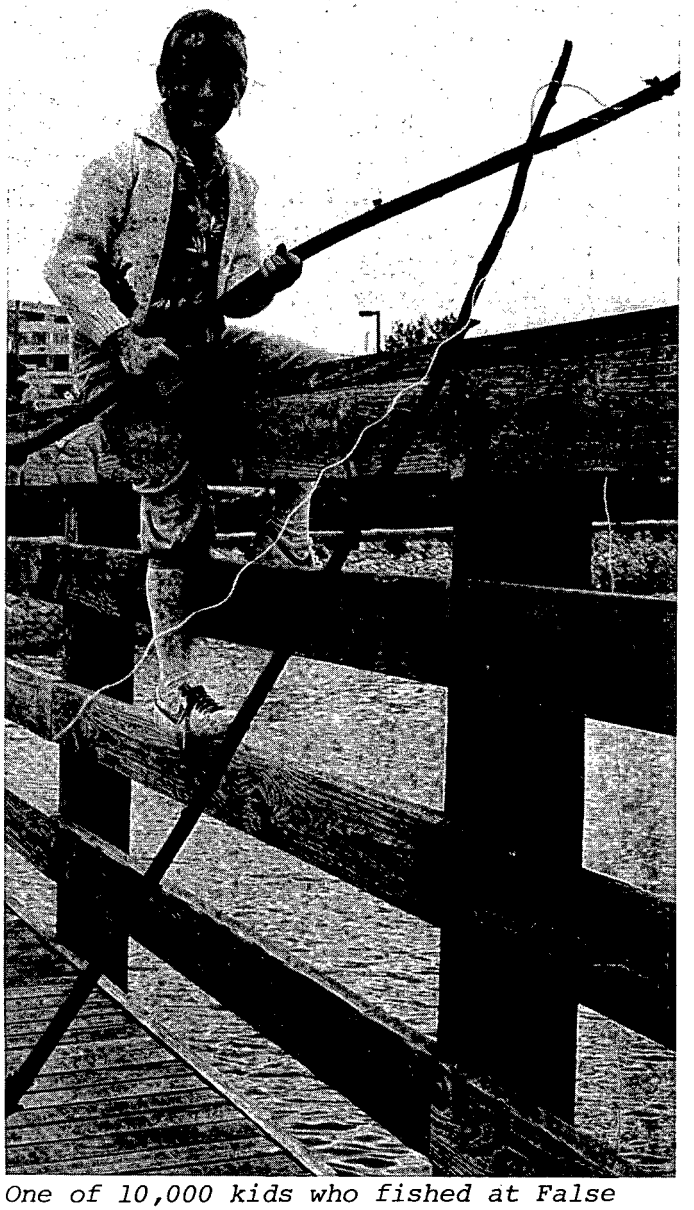
For more information on the evaluation of the public relations strategy, please contact James Boland, head, Public Involvement Unit, SEP, 666-8253.

Info memo

The "Info Memo" was developed to provide a rapid means of calling early attention informally to new and useful information. It is a one page "memo" with a format designed to make reporting easy and fast. In three years, 36 "Memos" have been produced.

Any employee may use "Info Memo" to:

- Note preliminary findings.
- Summarize reports to be published (technical, data, manuscript, etc.)
- Note major points of unpublished work, such as in-house reports, consultants' reports, and presentation papers.
- Draw attention to an existing or potential problem, and/or offer new insights into, or solutions for, problems.



One of 10,000 kids who fished at False Creek this year. Note specialized gear.

It's easy to submit items to "Info Memo." PBS will continue to generate its own research-oriented memos, but now 1090 W. Pender, SEP and FSB staff can contribute items at headquarters in Vancouver. If you wish to submit an item, call Linda Jamieson at 666-2206, and she'll send a blank form to you.

Have the item typed on the form, and send it back to Linda. Or simply submit your handwritten or pretyped item.

"Info Memo" is a good communication vehicle; one of its best features is that it's accessible to everyone. Most senior managers receive Info Memo, and all are asked to circulate them to their staff. Copies are also available for viewing at 1090 W. Pender in the Library (5th floor), in Records (8th floor), or in the Communications Branch (Information, 9th floor).

Remember, if your reports or findings are new or newsworthy, other staff members want to hear about them.

Contact Linda Jamieson, bio-science planning assistant, at 666-2206, for further information or for coordination of your "Info Memo."

Maxine Glover, Editor

Spurious emissions

Dick Carson was the successful candidate in competition for commercial fisheries licence manager.

We understand that Bill Webber, former licencing manager, is planning to retire and perhaps go fishing as of July 24. Best wishes to both Bill and his wife Sue.

Alan Boreham, SEP engineer, decided to make the most of cutbacks in the Engineering Division. He's sailing to Hawaii on a one-year leave of absence.

Kaolin and Fitzroy Williams proudly announce the arrival of their first child, Karie-Ann Melisha, born June 25. Fitzroy is a programmer/analyst with the Computer Services Division.

Born July 2 to Cammi and Don Mackinlay, a daughter, Christie Jean, weighing 3.7 kg. (8 lbs. 3 oz.) Don is a design biologist from enhancement operations, SEP.

Despite fielding a "reserve" side, a Field Services soccer team held the West Van Environmental Institute team to a 2-2 tie. The game was the fifth in a series of matches. Field Services has won 4 and tied 1 to date.

The Department's softball team is having another winning season. After nine games, manager Diane Paxton has the team breezing along with a seven-win two-second record. The players are extremely dedicated. Following each game, they meet at the Eldorado (a Vancouver shrine to sport) for debriefing.

Linda Aaloe, Personnel, and Scott Bleakley were married May 23 at seven o'clock in the morning. Early risers?

Eleven trainee fishery officers have recently joined the Department, and they will be posted to the following locations for their first year of service:

John Arnold-Salmon Arm
Dan Guerin-New Westminster
Milan Kupr-Prince Rupert
Jan Mann-Port Hardy
Gerald Pelle-Masset
Brad Rushton-Comox
Jim Steward-Prince Rupert
Cliff Todd-New Westminster
Bob Tupniak-Duncan
Byron Koke-Alert Bay
Les Hane-Kitimat

Bill Scholey has accepted an assignment to work on IMPAC, a national project to improve management systems in government services.

Fishery officers' moves and promotions include: Floyd McKee, who transferred to Prince George from New Westminster; Don Housego, who transferred from Offshore to a fishery officer position in Nanaimo; Dennis Burnip, who transferred from New Westminster to Smithers; Max Tscharre, previously a seasonal warden, is now a fishery officer in the Vancouver subdistrict. Doug Swift was promoted to subdistrict officer in Prince George from New Westminster.

Other promotions include:

Terrence Bedard who was appointed as a biological technician in Prince Rupert; Debra Porter appointed as a biological technician in Inspection, Victoria and Ed Verreth appointed as inspection officer in Victoria.

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Spurious...

Sharon Henderson was the successful candidate for the recent competition held for chief, Computer Services Division, Support Services Branch.

Rod Palmer has commenced duties as acting director, Support Services Branch; Bob Smith has accepted an assignment to work with the International Directorate on the adminstrative arrangements of taking over the International Pacific Salmon Fisheries Commission.

Doug Johnston, assistant deputy minister Pacific and Freshwater Fisheries, has accepted a position on Prince Edward Island where he will be federal regional economic development coordinator, effective August 16.

John Davis, director-general, Ontario Region is moving to Ottawa where he will be taking over from Ron MacLeod, as director-general, Fisheries Operations, Pacific and Freshwater Fisheries. Ron will be relocating to the Pacific Region where he will be assuming some new duties.

Donna Lee has been appointed secretary to the Habitat Management Division.

Gail Dodds has rejoined Field Services Branch and was the successful candidate in the recent competition for the position as secretary to the chief, Management Services Division in Vancouver.

Sherina Hasham has also joined Field Services Branch in Vancouver where she has commenced duties as secretary to the herring and salmon coordinators and to the licence applications officer.

Muriel Cook, administrative officer, Personnel Branch, passed away on June 13 after many years of service with the federal government, primarily with Fisheries. Muriel will be remembered by many of us whom she cheerfully helped throughout her time with the Department.

Waita Klapwijk and Irene Kapos, both draftspersons with SEP, have been laid off because of a shortage of person-years within the SEP Engineering. Both have been rehired on contract, though. Similarly, Terri Felins, clerk, Sam Watanabe, technician and Mike McMahon, draftsperson, were laid off, but assigned to the UIC Job Creation Program.

Rob Morley was the successful candidate for the recent competition held for the position of international fisheries advisor.

Leaving Field Services Branch is Dan Smith, who has won a competition to become associate director, Operations, Department of Indian and Northern Affairs, Vancouver.

Recently married was Ron Kadowaki, biologist, Prince Rupert, to Melody Midtdal; Melody previously worked for the Department in Vancouver with the Economics Branch.

Franco Frittaion has returned to Winnipeg. He was in Pacific Region for two months as acting chief, Information Branch. He had been temporarily seconded to Pacific Region from his position as chief, Communications Branch, Western Region. Replacing Franco, as Acting Chief of Information, is Brenda Austin.

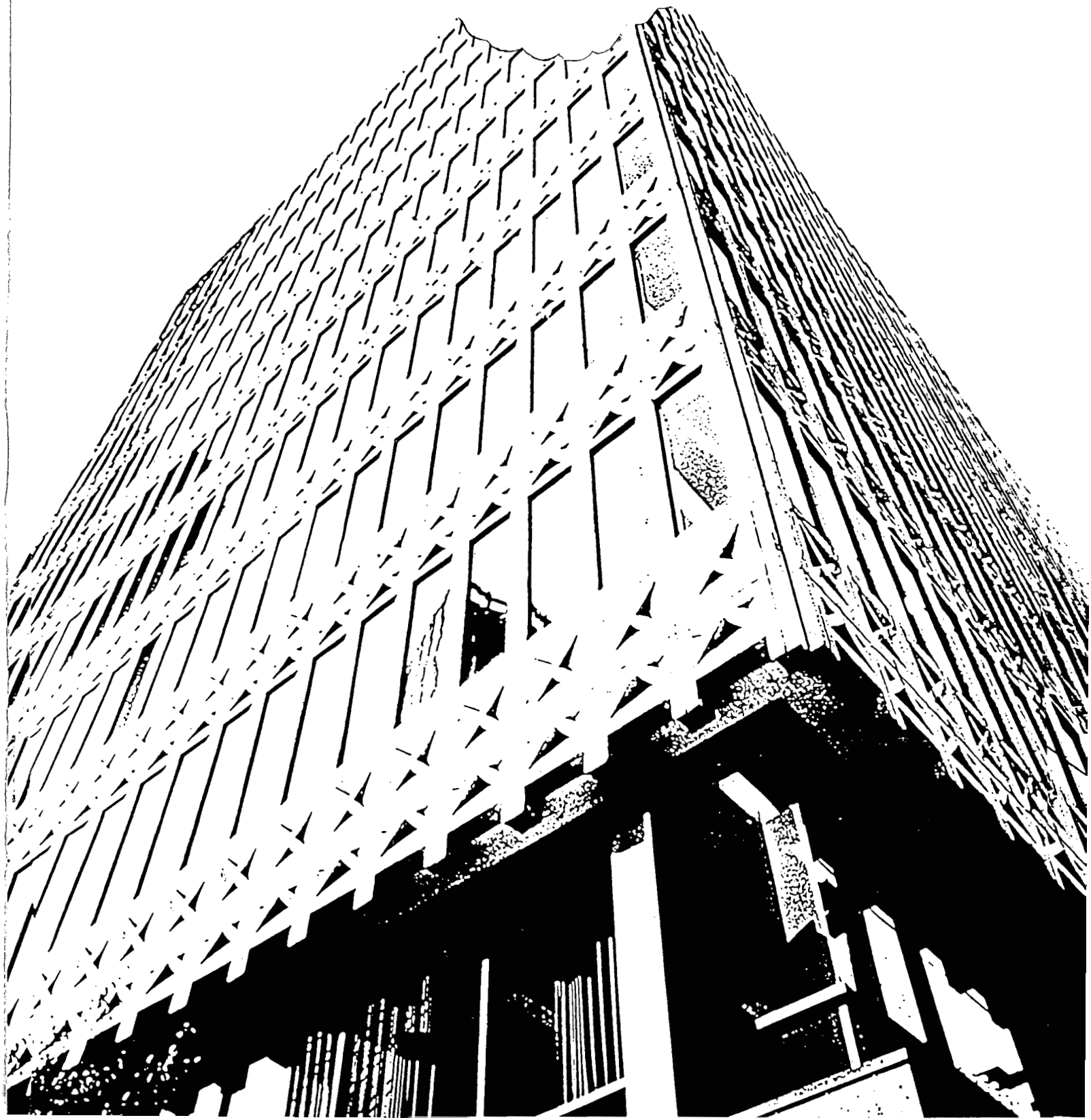
The Pacific Region has a new native communications officer. Gerard Peters comes to the Department with extensive experience in native organizations and community affairs. Gerard was most recently a director of the Lillooet Tribal Council before beginning employment with them as research officer. Gerard was writer/editor for "Nesika," produced by the Union of B.C. Indian Chiefs, and is a member of the United Native Nations. Gerard was also a founding member and vice-president of the Native Media Society, serving at various times as manager, education coordinator and, finally, as a member of the band council for the Mount Currie Band. Gerard was also manager for the Samahquam Band.

Gerard Peters, native communications officer

SOUNDER

Volume X Number Six September 1982

Taking the bite out of bureaucracy



Give a little come pay day

The slogan for this year's United Way campaign is "just one day's pay goes a long way".

The suggestion, of course, is for those of us who can, to contribute one day's pay. This may seem like a lot, especially during the current wage restraints, but the same economic conditions which affect us, have much more seriously affected many of our friends and neighbours. One out of every three persons in the Lower Mainland has received aid from the United Way agencies in the past year. The need for United Way Services has never been greater.

The objective this year for the federal public service is $240,000. Not everyone is in the position to contribute one day's pay, but we are all in a position to contribute something. The payroll deduction plan makes it relatively easy. Even a contribution of 50¢ per day will help to provide a needed service.

In a few weeks, a canvasser will be calling on you. The canvasser is not there to pressure you into making a contribution. The choice is yours. If you have any questions about United Way, its agencies and services, the canvasser will be glad to answer them.

Lorne Hawrelak
Public Service Campaign Manager

The United Way

Cover photo: 1090 West Pender Street in Vancouver, headquarters of the Department of Fisheries and Oceans, Pacific Region.

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Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Committee eases computerization

Many people in the Department are becoming fascinated by computers, and Apple microcomputers are the main reason. This brand of computer is being used by regional management biologists, research personnel, SEP hatchery staff and many headquarters staff.

These computers (usually referred to as Apples) are being used for a constantly growing number of tasks. Programs such as the Skeena management model allow biologists to find more effective management techniques; calculations essential to hatchery operations can be done rapidly and accurately using programs developed for SEP staff; data on catch values for international negotiations are evaluated with Apples; coded-wire tag data is stored and formatted using an Apple; graphic presentations of data can be done in a professional manner; the list goes on. Then, of course, there are the games.

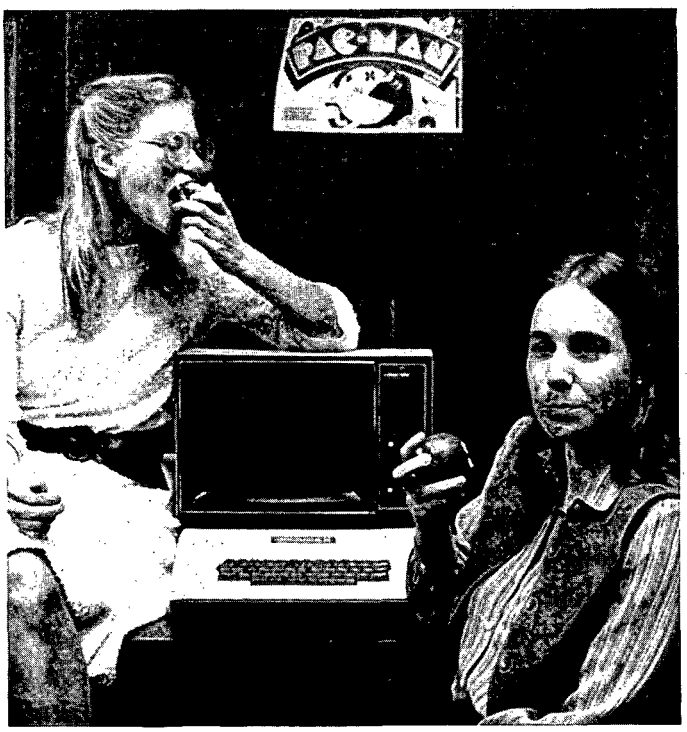
Computer games are the first things that most people learn to use on an Apple. The beeps, screeches and flashing lights of space wars, ghosts, and crashing cars are the best known feature of the Apples. These games do serve a useful purpose, however; they represent an effective way to introduce people to computers and remove the apprehension most feel about computers. A few games of Pacman or Alien Invaders will convince most people that computers are something anyone can use. At this point, help from people experienced with computers can remove the stumbling blocks to effective use of an Apple.

To ensure that support for Apple users occurs, the Apple Users' Committee was re-activated last year. This group consists of representatives from all of Pacific Region branches that use Apples, and it is designed to address the concerns of Apple users. Specifically, the group's main function is to recommend software, hardware and programming techniques to allow for common use of the system. It also recommends policies for the development of Apple use and provides help to users. An inventory of available programs has been developed and should allow more efficient use of everyone's budget as needless duplication is eliminated.

Members of the committee are listed in the box below. All of these people have agreed to provide aid to users and to spread information on Apples throughout their units.

Another aid to increasing the use of Apples is a bulletin board set up for Apple information. This is situated by the SEP Program Development Branch computer room (currently on the second floor of 1090 West Pender Street). Anyone interested in finding out more about Apples, whether buying, programming or whatever, should contact a member of the Apple Users' Committee.

Gordon McIntyre
SEP Planning



Apple users Linda Aaloe (left) and Heather Fletcher enjoy a quick one.

The Apple users' committee

Vic Palermo	Head Recovery (Chairman)
Carol Cross	SEP Operations
Paul Starr	Fraser River, Regional Planning
Linda Aaloe	Systems Group
Ken Shortreed	West Vancouver Laboratory
Gordon McIntyre	SEP Planning
Dave Peacock	North Coast Management (Prince Rupert)
Tom Shardlow	South Coast Management (Nanaimo)
Fred Wong	Pacific Biological Station

Diary program yields firm sport catch figures

The tidal sportfishing diary program appears to be holding its own this year.

The program, initiated in mid-1979, is aimed at developing an accurate sport-catch statistical system based on diaries kept by anglers.

Bill Masse, chief, habitat management and recreational fisheries analysis, Economics and Statistics Branch, has already dubbed 1982 as "the landmark year" for the program.

Here's why:

- For the first time, the angling population has already been identified through the tidal sportfish licencing system. This allows the program to be aimed specifically at anglers. In previous years (prior to implementation of the sportfish licence), voters' lists or telephone books were used as the basis to sample the entire population of B.C.

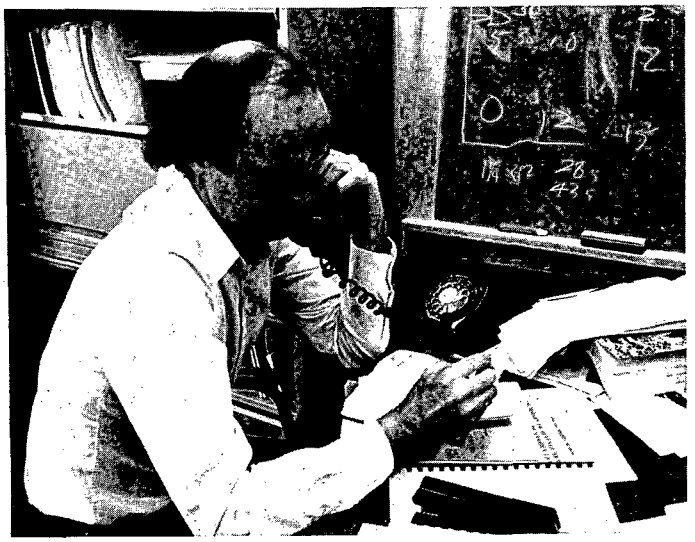
- More than 5,000 anglers have agreed to participate in the 1982 program; approximately 3,200 anglers have now returned their diaries for the first quarter. Compare that with diary returns in previous years: 137 diaries in 1979, 322 in 1980, and 700 in 1981.

- The Branch has developed a system of checks and balances to compensate for the built-in biases of a mail-survey program.

How accurate is the data obtained through the diary program, compared to data obtained by other means?

"The creel survey is probably the most accurate, but it's also the most expensive," Bill says. "The fishery officer method (used since the early 1950s, by which fishery officers estimated catches, using a variety of judgmental techniques) wasn't very systematic and you couldn't guarantee that the fishery officer could put in an adequate amount of time. This (the diary program) is definitely superior to that."

According to a report prepared by former recreational fisheries analyst Mary MacGregor, sport fish catch statistics in the 1970s varied substantially, depending on the source. Published reports, based on estimates made by fishery officers, stated that the total chinook and coho catch averaged 411,000 pieces a year between 1972 and 1976; however, a study using data from the Head Recovery Program estimated 891,000 pieces a year for the same time period. The National Survey of Sportfishing, a mail survey, estimated that anglers caught 1,187,000 chinook and coho in 1975 alone. Data from a mail survey of boat owners showed that approximately 1.7 million pieces of salmon were caught in 1978 in the Georgia and Juan de Fuca straits.



Bill Masse

According to Bill, this is the first time data gathered from a mail survey have been close to data from creel surveys. Most mail surveys estimate catches twice as high as catches recorded from creel surveys conducted simultaneously. The estimate of chinook catch was "bang on" with that of the creel estimate although there were discrepancies in other estimates.

"It (the diary program) will definitely replace the creel survey in less heavily fished areas," he said, "but we'll probably have to have a combination of the two, for cross-checking purposes."

"It's the first program that gets a comprehensive, coastwide data system (on sport fish catches) and it goes on throughout the year," said Jarek Gwiazda, program manager.

Cindy Low
Contributing Writer

Acid rain: the Canadian experience

This is the second in a series of three articles on what has been called the most serious environmental problem facing mankind.

The first indication of acid rain problems in Canada was in Nova Scotia in the 1950s, when sport fishing catches of Atlantic salmon began to show a sharp decline. But full realization of the seriousness of the problem came much later.

In 1966, a University of Toronto zoologist named Harold Harvey introduced 4,000 pink salmon into a small lake in the Killarney Park wilderness, near Georgian Bay. All exits from the lake were screened. Not a single salmon could be found next spring. In 1968, Harvey studied the lake's aberrant population of dwarf suckers. In the summers of 1969 to 1971, five tributary lakes were found to be almost devoid of fish. By 1972, sampling had established that more than 60 lakes out of 150 in the area had suffered major losses of fish stocks. The lakes were 80 km distant from Sudbury, presumably outside the deposition range of pollutants emitted by Inco Ltd., the largest sulphur dioxide souce in Canada.

More reports are coming in. Atlantic salmon are considered to be extinct in at least nine Nova Scotia rivers. Thirteen other runs are bordering on extinction and another nine are threatened. More than 1,200 lakes in Ontario are now considered to be "acid dead or dying." Anywhere from 15,000 to 48,000 more are considered to be threatened. The Province of Quebec reports there are more than 1,300 acid-stressed lakes in that province. Surveys are continuing across Canada.

Areas of North America containing lakes sensitive to acid precipitation.

What are the sources of acid rain in Canada? Inco Ltd. at Sudbury has already been mentioned (see Acid Rain and the Pacific Region, July-August Sounder) as the biggest sulphur dioxide emitter. The impacts of pollutants on the Sudbury landscape were so great at one point that the area served as a training ground simulating lunar conditions for American astronauts.

The second largest sulphur dioxide emitter is located in Noranda, Quebec. Next in line are Thompson and Flin Flon, Manitoba. Ontario Hydro accounts for three of the top ten emitters in Canada. The natural gas processing in Alberta is the major emitter of sulphur dioxide in that province, although the industry may be surpassed at some future time by emissions from tar sands developments. Trail is the largest of five major sources in British Columbia.

Rehabilitation strategies for acidified waterbodies are being developed, but the results are highly variable. A limestone filter has been effective in Nova Scotia's Mersey River hatchery water supply system. An acid-stressed lake 32 km north of Sudbury appears to be capable of recovery after adding 110 lbs/acre of lime. But rehabilitation attempts failed in an "acid dead" lake 15 km from Sudbury. More than 32 t of lime and limestone were added to the lake at a cost of $550 per ha. The acidity was reduced a hundredfold, to a level just below neutrality, and 2,500 bass were introduced. All of the fish were gone within a year. At a second "reclaimed" lake nearby, 1,200 brook trout were lost within four months. In further tests, brook trout began to die in the lake within 48 hours. Acidity was no longer a problem in these lakes. The fish died of copper, zinc and nickel poisoning, metals which had been mobilized in the initial acidification process. As well, additional information suggests that massive liming may be toxic to some invertebrate fish food organisms.

Jim Morrison
Biologist
Water Quality Unit

The long and winding (and cold) road

A belated hello from SEP's northernmost community advisor

I'm sitting in a ferry lineup waiting to go to the Charlottes. It was supposed to leave at 9 am, so I left Terrace at 6 am and arrived at 7:30 to confirm my reservation, only to find out that the ferry would not arrive until 11:30. I could have gone by plane but wanted to take over promised supplies for a number of projects on the Island. Besides, it costs about $300 to rent a car, and the ferry is a great place to catch up on your paperwork. Oh, by the way, my name is Barry Peters, the new community advisor for SEP in the northwest. About two months ago, a nice fellow named Mike asked me to write an article for the Sounder. I got caught up in a lot of projects and didn't get a chance to do anything until now; I guess it's good that the ferry was late. After all, he said he wanted an article about what it was like to manage volunteer enhancement projects in the north.

People in the north, because of their close quarters with the wilderness, are much more familiar with nature and its processes than are people in the south. The biggest challenge is teaching people to realize that they cannot take their fisheries resource for granted anymore; that they don't have the right to take as many fish as they want to, when they want to; that fish are not limitless and everyone using the resource has an impact on it; that one cannot blame the other guy all the time. Those that already realize this and accept their share of responsibility are almost always sure to volunteer their time or at least express an interest in finding out what the public involvement program is all about. Sometimes, moral support is just as important as financial or physical support.

The biggest factor limiting enhancement in the north is the logistical problem of transportation. It may sound simple to get from Sandspit to Tasu, but visitors usually have to stay overnight unless a plane is chartered. Hence, for a single stop, one might have to spend 24 hours in Tasu. Or one may have to go to a school science fair in Aiyansh on a day when the river is up and you have to drive the long way around to get there. That sort of schedule makes time management a nightmare.

Barry Peters

Primary resource industries such as logging and mining are the mainstay of the north. Both these can be detrimental to water systems and pose a never-ending threat to the fisheries resource. Education, with respect to these industrial interests, takes on a whole new perspective. Again, we have to work on a person-to-person level and hope that the word gets around.

When one mentions "north" everyone thinks of the cold climate, and it always causes concern when one is dealing with salmonids. Since their development is so dependent on temperature, cold water tends to slow it down, and -40°C nights cause freezing and sometimes the loss of entire projects. Developing new systems for cold water fish culture is something I plan to specialize in during the next few years.

But no matter what problems exist here in the north, the beauty of the people and the country seems always, in the final analysis, to come through on top.

Barry Peters
Community Advisor
Terrace

Little people play a big role

"A-hancing we will go! A-hancing we will go." So sing the kids. They really can't quite pronounce enhancement the way it is written, but they have the idea.

Children, a vital part of SEP's public education program, are amazing. The future of our resource-based economy lies with them. Teaching them about the biological and economical management of our renewable salmonid resource is one of the most gratifying aspects of a community advisor's job. Their boundless energy, all-encompassing trust, innocence and compassion make them a joy to work with. At the same time their devilish behavior forever keeps you on your toes. Their capacity to absorb knowledge is incredible, as is their ability to ask the most complicated question without realizing it. For instance, what does one say to a six-year-old who perks up, in the middle of your talk about where fish live, to ask, "Why does the mother fish leave her babies? Why doesn't she look after them?"

Kids! There seems to be a contagious aspect to their enthusiasm and inquisitiveness. Parents, teachers and concerned folk from all over this province are beginning to realize that they, too, can and must do their share for our fisheries resource. Their interest becomes as insatiable as the children's as they strive for excellence in their respective projects, whether it be a creek cleanup or a small scale hatchery.

Barry Peters

Distinguished member of Salmonid Ahancement Program.

More community advisors hired

Three additional community advisors have been hired by SEP's Public Involvement Unit, says James Boland, head of the unit.

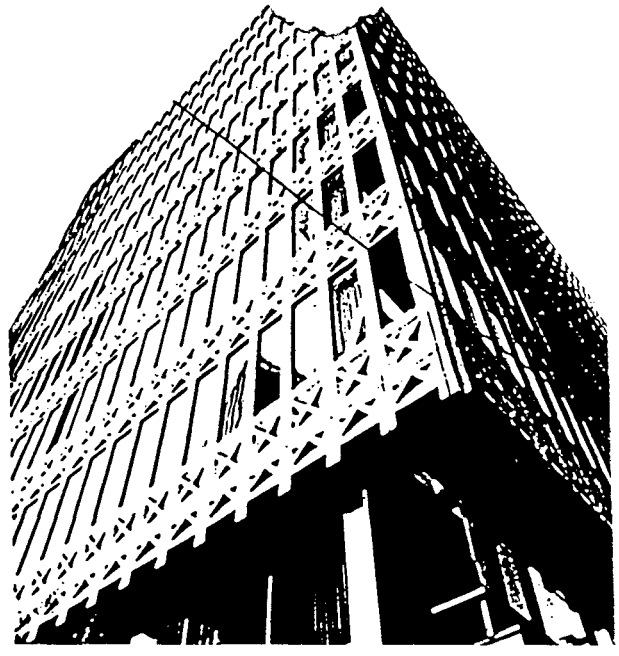
The advisors, who will be stationed on Northern Vancouver Island, the Sunshine Coast and on the Queen Charlotte Islands, were selected after interviews with 22 candidates. All three of the new advisors will be transferring from other departmental positions. The advisors are: Gary Taccotna (Queen Charlotte Islands), currently assistant hatchery manager at Pallant Creek hatchery on the Charlottes; John Lewis (Sunshine Coast), currently a fishery officer at Steveston, and; George Bates (Port Hardy), currently the assistant hatchery manager at Puntledge River hatchery. The hiring is still subject to appeal.

"Three new positions were required due to the overwhelming response from the B.C. community to volunteer time and materials to work on enhancing salmonids. There are already approximately 7,000 volunteer working on over 150 projects throughout the province, "James says," and the six existing CAs could simply no longer keep up with the demand. Our success with Public Involvement has been quite phenominal and is dependent on the ability of the CA to respond to every request."

Taking the bite out of bureaucra

Bu-reauc-ra-cy - n., pl. -cies 1. the body of officials and administrators, esp. of a government or government department. 2. excessive government red tape and routine.

Regardless of which definition of bureaucracy is used to describe Fisheries and Oceans, the Department is tainted with the image of a cumbersome and uncoordinated organization, stumbling under its own weight. But is it more than just an image? Director of Regional Planning, Al Wood, takes a closer look at the problem.



In case you haven't guessed, a lot of the problems which must be solved to reach Fisheries objectives are bureaucratic and not resource related. I came across a paper, a while ago, which listed 16 common problems of large bureaucracies. They looked amazingly familiar to me. How do they look to you?

Diminished comprehension of the system
How many staff, from secretaries and clerks to managers, know what other branches are doing?

Diminished public participation in decisionmaking
How responsive is the department to its public advisory groups? And, in turn, just how responsive are those advisory groups to the public they represent?

Diminished access to decision-makers
Have you ever tried to get a meeting with a senior decision-maker?

Increased reliance on experts
In 1946, there were no economists, biologists, engineers, computer scientists, and other experts in the Fisheries line of organization. In 1982, we have highly skilled specialists who are experts in a single species or technology.

Increased system coordination and control costs
Staff are spending more and more of their time at meetings, essentially for coordination and control.

Increased depersonalization within the system
What percentage of Fisheries staff do you know?

Increased alienation
Both staff and clients are showing signs of alienation resulting from an inability to influence the direction and values of the organization and from the negative feedback their attempts receive.

Increased challenge to organizational values
Have you looked at the Department's media coverage, the number of demonstrations, sail-ins and legal challenges in the last five years?

Increased and unexpected policy consequences
The Davis Plan, intended to increase profitability, resulted in fleet cancer; the Babine Project, initiated to enhance sockeye, resulted in decreased production of pink, chinook, steelhead and minor sockeye stocks; vessel subsidies, intended to stimulate boatbuilding, stimulated a fleet explosion.

Increased system rigidity
Ask anybody in Fisheries management if there is now more or less control of the fleet than in the past.

System breakdowns
Related to increased system coordination and control costs (above). Crises are becoming more frequent.

Decreased innovation
Have you heard of any good, usable Fisheries ideas lately? Have you heard of managers

acy

willing to accept ideas and of employees willing to implement them?

Decreased legitimacy of leadership
Scan last year's newspaper clippings and see how many calls there have been for resignations of Departmental employees. Even a few years ago, this was unheard of.

Increased system vulnerability
As the profile on even small issues becomes more and more often elevated to the political level, the Departmental system becomes more and more vulnerable.

Declining system performance
Numerous employees, especially those who have been with the Department for many years, have seen Departmental efficiency decline annually.

Decreased awareness of actual system performance
Many staff cannot acknowledge how badly off the Department and the resource are.

It appears that Fisheries suffers from most, if not all, of these problems which are generally attributed to excessive size, complexity and interdependence of the bureaucracy.

Basically, these problems are an indication that our bureaucracy is approaching, or has already reached, unmanageability.

If these are, in fact, symptoms of the Department, then what can we do about them? We may need to initiate some widespread actions; probably the most important are those that can simplify our day-to-day business. The strategy outlined below illustrates how a departmental system can be made more manageable.

STRATEGY TO IMPROVE DEPARTMENTAL SYSTEMS

Review and rationalize system values

1. Review and rationalize system values.
2. Restructure goals.
3. Restructure strategies and tactics.
4. Actively use the goals, objectives, strategies and tactics.

Decrease system size, complexity and interdependence

1. Seek to simplify the system, legislation and problems.
2. Organize for flexibility, innovation and responsiveness.
3. Establish independent geographic suborganizations.
4. Organize for generalists rather than for specialists. Organize for line rather than function.
5. Consolidate functions, groups, and roles.
6. "Give away" as many problems and acquire as many opportunities as possible.

Increase system information communication

1. Increase information output to public and staff.
2. Make it easier for the public to participate meaningfully in decision-making.
3. Create systems to aggregate, integrate and interpret information and specialists' advice.
4. Make those requiring communications a part of the "information system."

Manage the system in business-like fashion

1. Develop and maintain a plan with priorities and schedules.
2. Allocate resources to priority projects.
3. Measure performance through financial and program management.
4. Hold staff accountable for assignments.
5. Reward good performance, solution of problems and acquisition of opportunities.

However, change must often come from within a department; who better to identify the problems and to recommend possible solutions, than the people who encounter them frequently? So, if you have any suggestions on how to simplify and improve Fisheries bureaucracy--either within your own department, or in another--please phone me at 666-3855, or mail them to me at regional headquarters.

Al Wood
Director of Regional Planning

Sounder welcomes the response of staff to this article.

The Tasmanian solution

Lee Straight, recreational fishing advisor, went for a holiday fishing trip to Tasmania last spring. His impressions of Tasmanian hydro development inspired the following article.

On a recent fishing trip to Tasmania, I learned much from my hosts between outings. From my appreciation of the effects of power dams on waterways and their ability to support trout, I venture the opinion that the surprisingly large hydroelectric development of that beautiful subcontinent has improved the trout fishing much more than it has reduced it.

Tasmania, shaped like a shield, is an island state of Australia with an area about twice that of Vancouver Island. It lies about 1500 km south of the "lower, right-hand" corner of mainland Australia.

The interior plateau of Tasmania is much like the valley-bottom dry-belt country of Kamloops, perhaps more like that vast, trouty drybelt where southeastern Washington State merges with Idaho and Oregon. Tasmania has a long history of good trout fishing that dates back to the first brown trout introduction of 1864--the first in the southern hemisphere, by the way--and to the stocking of rainbow trout in 1893. The soil and waters are so rich there, as they are further east, in New Zealand, that trout populations exploded in river and lake.

They exploded in many other countries in that period, all from stocking with rainbows and browns. In most places, since early stocking and discoveries of unexploited natural stocks, too many fisheries have been swallowed by massive hydroelectric impoundments. Either great lengths of river are drowned or lakes are dammed so high that the periodic variation in their depths, from draw-down, has badly depleted the fisheries. More by accident than by planning, I surmise, that has happened much less in Tasmania.

The main hydroelectric program involves small dams and many viaducts, canals and tunnels to join the flow from clusters of basins into just a few major power sites. Many marshes have been flooded only a few metres deep and many small lakes raised only a few metres. For the uninitiated, the underwater life upon which fish depend for food can stand

fluctuation in lake depth of as much as three to five metres with little damage. With greater variation in water levels, the productivity of the critical shallows or borders declines. Vary a lake depth by eight metres or more, particularly if that lake lacks shallow zones, and you effectively destroy much trout habitat.

So, despite a long and bold hydroelectric program in Tasmania, the productivity of the existing lakes was usually improved by flooding tributary bays that formerly were blended into low slopes and by flooding swamps, bogs and meadows. That is the pattern in some of the British Columbia interior, where farmers and ranchers lightly dammed similar basins for irrigation water. Fishery managers and anglers quarrel with that sort of program only when ranchers draw too much water or lake shallows are drowned too deep.

The trouble with many impoundments, however, is that they often involve the destruction of river angling; the classic pastoral kind where the angler wades the banks of rivers and entices a trout from pocket or pool. It is often true that by turning sections of stream into lake, you're often left with good lake fishing, but most of it must be done by boat. This phenomenon is typical of impoundments in B.C. because steep shores and heavy forest inhibit lakeshore wading and allow no room for back-casting. Even meadowy lakes in most parts of the world have sticky, loamy, well-nigh treacherous shallows. And that's what impressed me most about Tasmania.

Partly submerged shoreline along Tasmanian lake shows minimal effects of impoundment.

Lee Straight with day's catch.

In my modest travels about this old globe, I've rarely seen so much generally safe and enjoyable lake-bank fishing; mostly superb flycasting, but good for spincasting as well. Since many of Tasmania's trout lakes are former meadows or have those grassy shores, and since the rich soil is so sandy, you can venture into the very gentle shallows, almost anywhere around most lakes, to start casting.

I must resist the urge to use too many details--yarn, that is--to describe what appears to be the finest trout fishing land I've seen, but I can recommend the Tasmanian experience to hydroelectric developers and to frustrated fishery managers as a demonstration, deliberate or accidental, in maintaining the production of electricity, tourism and superb trouting, all at the same time.

Lee Straight
Recreational Fisheries Advisor
Field Services Branch

Untapped resource

A school of krill, recently sighted in the Antarctic Ocean, may have contained as much as one-seventh of the world's total tonnage of fish. Although they are a staple food for whales, krill have not yet been harvested by man.

Bulletin

Pension loophole eliminated

The Supplementary Retirement Benefits Act was recently amended to provide for the prorating of the first cost-of-living increase authorized following termination.

Previously, all pensions were indexed for inflation on an annual basis, every January. This permitted retiring employees to collect the adjusted pension rate by retiring shortly before the date of indexing. Prorating will eliminate this loophole. The amendment applies to all continuing monthly benefits, including immediate annuities, annual allowances, deferred annuities and survivor benefits. These will now be prorated to reflect the number of months remaining in the retirement year after the month in which termination occurs.

* * * * *

Premiums for the Group Surgical Medical Insurance Plan have been increased as of August 1, 1982. For details on the new government and employee rates, staff should contact Edie Preugschat, personnel services officer, at 666-6269.

The next retirement seminar, to be presented by the corporate pay and benefits staff of the Department's Personnel Directorate, will be held in February/March 1983. Please call Edie Preugschat, at 666-6269, if you are retiring soon and wish to attend.

* * * * *

The annual sale of Canada Savings Bonds to the public service, through the payroll savings plan, will soon be underway.

Purchase of bonds through payroll deduction is restricted to permanent employees only. Seasonal and contract employees may purchase bonds on a cash basis only.

Pay deduction forms will be attached to salary cheques dated September 10, 1982. Employees who normally have their salary cheques deposited to their bank accounts will have bond application forms mailed to their home address. Permanent employees who do not receive an application should contact the pay and benefits clerk responsible for their account.

Leavenings

"Habitat under pressure"

The Department once again has a display in the Canada Pavillion at the PNE, from August 21 to September 6. The theme of the display was "Habitat under pressure." Through the use of written text and colorful graphic panels, the display informs the public of essential salmonid habitat. Problems of habitat degradation were portrayed, as well as the means by which the public can help protect, restore and enhance salmonid habitat.

Following the PNE, the display went to the Arts, Sciences and Technology Centre at 600 Granville Street in Vancouver on September 7. From there it travels to the Adams River Exhibit, October 9 to 24.

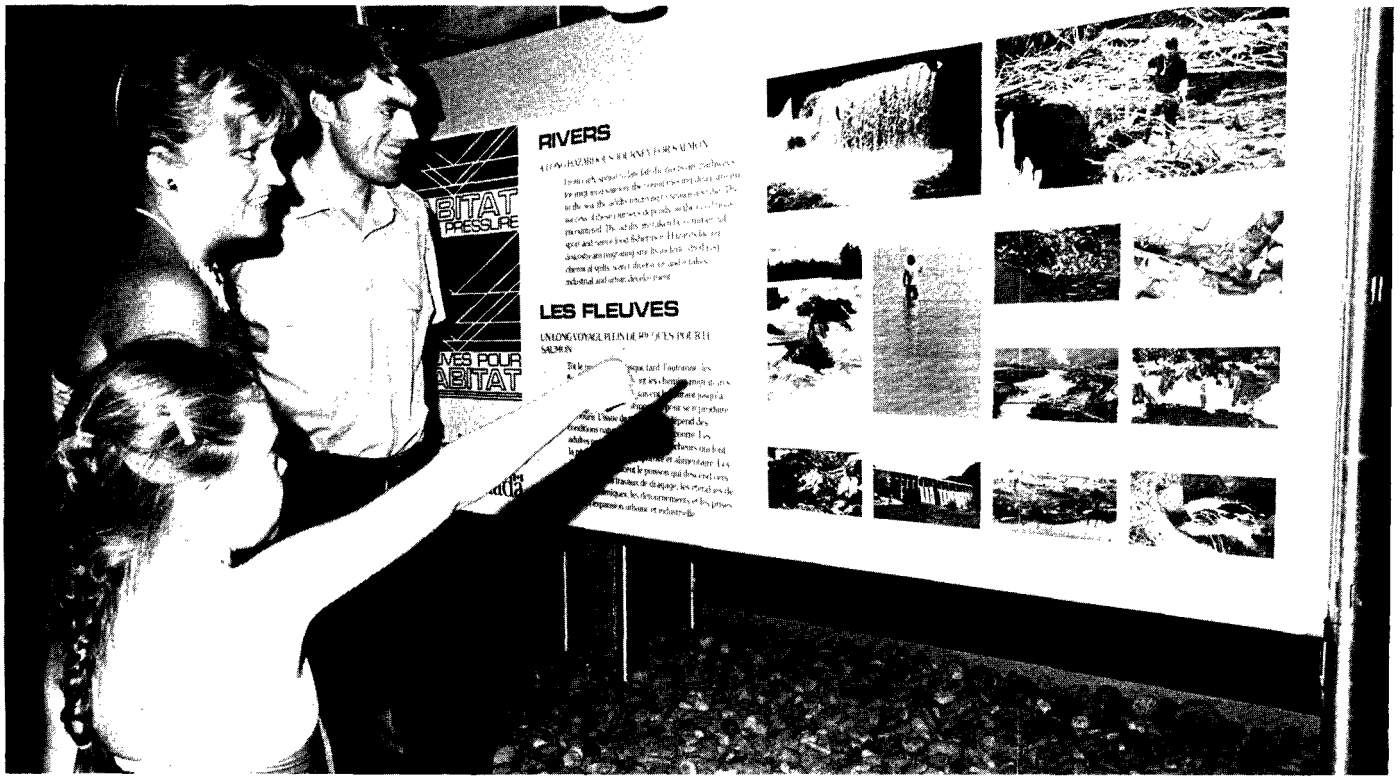
Branch renamed

Wayne Shinners, director-general, has approved a change in the name of Pacific Region's "Information Branch" to "Communications Branch," in line with those in other Regions.

Fishermen's newsletter

The Communications Branch is re-establishing the "Fishermen's Newsletter" on a quarterly basis. A Newsletter was issued in April of this year, and three more are in the planning stages--one in September and November of this year, and one in February 1983.

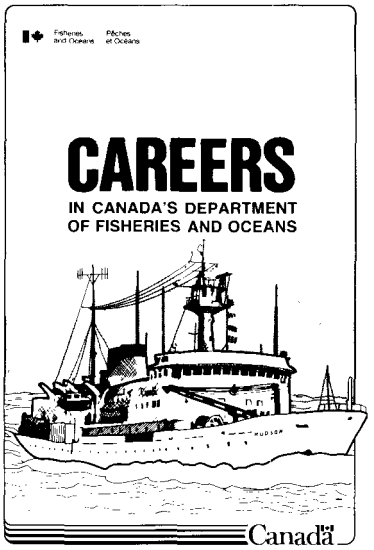
The Fishermen's Newsletter informs commercial fishermen and others involved in the industry about Department policies and programs. Comments and suggestions regarding articles are welcome, and should be addressed to the Editor, Fishermen's Newsletter, Communications Branch, 1090 West Pender Street, Vancouver, B.C. V6E 2P1 (Phone 666-1384).



Fishery officer Randy Nelson explains habitat display to PNE visitors.

"Careers in DFO" booklet

A new booklet, entitled "Careers in Canada's Department of Fisheries and Oceans," is now available in limited quantities from the Communications Branch. It describes some of the day-to-day activities and minimum qualifications necessary for a wide range of Departmental occupations, which are grouped under such categories as "conservation and protection," "scientific and engineering services," "ships' operations" and "administration."



Film on conservation area

The Communications Branch will purchase three prints of a 16 mm film on Roderick Haig-Brown and the Adams River sockeye run, entitled "Roderick Haig-Brown Conservation Area." The film, produced for the Department by Dick Harvey, will be shown at the Adams River Exhibit from October 9 to 24. Following this exhibit, prints will be available from the Communications Branch on a 2-week loan basis to interested staff, school teachers, clubs, etc.

Salmonids in the classroom

A primary (kindergarten-grade three) version of SEP's Salmonids in the Classroom has been developed under the supervision of Linda Bermbach, education coordinator for SEP's public involvement program.

This version will be ready for extensive field testing this fall. School districts participating in the project are: Coquitlam, Comox-Courtenay, Cranbrook, and Kamloops. (Other areas which may be involved are: Victoria, Port Hardy, North Vancouver, Masset, Penticton.) The field testing will be monitored by members of the writing team, and it is expected that feedback from the classroom teachers participating will be

continued on page 14

continued from page 13

analyzed and subsequently incorporated in the final package which will be produced during the summer of 1983.

Fishery Officer Version SIC

This version of Salmonids in the Classroom has been prepared to assist DFO staff, in particular, fishery officers, in their preparation for classroom presentations. Under the direction of Linda Bermbach, education coordinator for SEP's public involvement program, materials were developed to suit the needs of those who are not teachers but who are called upon to speak to school groups.

Special acknowledgement should be given to Norm Lemmen, Chuck Chestnut, and Brian Richman for their suggestions for and review of the material.

This package will be produced and ready for distribution sometime this fall, Fishery officers are urged to watch for it and use it.

For more information, contact Linda Bermbach at 492-3523.

What you can expect

by Pat Phillips

What a surprise! An employee came up to me recently in Vancouver and said, "We didn't even know there was a Support Services circular manual until we read it in your column." Hopefully, anyone who does not have one will now have requested a copy. Circulars are being distributed and some are being updated. If you have suggestions for additions please don't hesitate to send it along to the chief in charge of the division concerned, as named in the Support Services Branch distribution list in the front of the book. My suggestion is that the Personnel Branch be allowed a section in the book so we could include Personnel circulars. I include them, anyway.

Be aware: that the newly introduced "Request for Classification Action" form is in use immediately. Please do not use the form 02-1246--Classification Action form. The new form will not be printed until mid-September, so please make copies of the sample provided for your present use. This format contains all the information that classification requires, neat and tidy, and the branch directors must sign. No bypassing the Director anymore.

Also available is a revised, updated descriptive booklet on the Disability Insurance Plan. If you are a member, but haven't received a copy, please request one from your pay and benefits clerk at the Personnel Division. A new government handbook (May 1982 issue) for vehicle rental has recently been distributed too. We received the May issue in August, and it expires October 31, 1982. Oh well, budgets don't allow for vehicle rentals these days.

Pat Phillips
Decentralization Projects
Nanaimo

Letters

Long live the groundfish

Dear Editor,

You mentioned in a recent letter that you'd be interested in an article on the life expectancies of some marine fishes.

The range of groundfish ages, findings produced by our fin-ray cross-section and burnt otolith cross-section methods, might be worth mentioning as the ages are much greater than previously determined for most of the species studied. The maximum ages obtained represent a significant change in our understanding of the possible life span of fishes.

Our interpretations have been validated for lingcod, sablefish and dogfish using oxytetracycline (OTC) injections in conjunction with the regular tagging programs, and our conclusion, that rockfishes can be very old, has been confirmed by analyzing the natural radionuclide concentrations in the otoliths. An OTC tagging project is currently underway to validate the flatfish ages.

I've enclosed a table that I hope will be useful.

Doris Chilton
Superintendent, Ageing Unit
Resource Services Branch

Maximum ages obtained for some species of groundfish studied at the Pacific Biological Station.

Family and common name	Maximum ages (yrs.)
Anoplopomatidae	
Sablefish	53
Gadidae	
Pacific hake	23
Hexagrammidae	
Lingcod	21
Pleuronectidae	
Arrowtooth flounder	22
Rock sole	25
Dover sole	45
English sole	22
Scorpaenidae	
Rougheye rockfish	140
Pacific ocean perch	90
Shortraker rockfish	120
Silvergray rockfish	80
Darkblotched rockfish	47
Widow rockfish	58
Yellowtail rockfish	64
Bocaccio	36
Canary rockfish	75
Redstripe rockfish	41
Yellowmouth rockfish	71
Harlequin rockfish	43
Sharpchin rockfish	45
Squalidae	
Spiny dogfish	66

Holy hermaphrodite

Believe it or not, this hermaphroditic chum was discovered during an egg take, on the Salloomt River, for Snootli hatchery. The photograph was submitted by Ken Smith of SEP facilities. A hermaphrodite is an individual displaying both female and male internal and external sex organs (note the eggs and testes). In Greek mythology, Hermaphroditus, a son of Hermes and Aphrodite, bathed in a pool haunted by a nymph in love with him. He joined with her to become a single bisexual person.

Spurious emissions

Dr. Art May, senior assistant deputy minister, Atlantic Operations, has been announced as the new deputy minister for the Department; he will be commencing his duties on October 1.

Diane and Dennis Demontier, community advisor, Kamloops, are proud parents of a son, Colin Joseph, born August 13 and weighing 4.5 kg (8 lb 3 oz.)

Rejoining the Department after a sojourn in the Maritimes is Doug MacDonald who has been appointed as the economic advisor, SEP. He replaces Rob Morley who has taken up his new duties in international affairs.

Bernice Abramson, clerk, Fishing Vessel Insurance Plan, retired on September 3. Her plans include spending half her time in Palm Springs with her husband, who will soon be retiring as well.

Russ Hilland who has been acting unit head, North Coast Facilities, SEP, is in the process of relocating to Bella Coola to assume his duties as stock enhancement officer (hatchery manager) Snootli hatchery, a position which he won last March.

Flo Van Alstyne won the competition for secretary to SEP executive director; Flo spent six years with several government departments in Ottawa before returning to the coast (she hails from Kamloops).

We are told that Dick Harvey is on a special assignment with a Japanese film company from mid-August to mid-September.

Ron Tarves has completed his contract with the Department; his main assignment was to complete a study on Fisheries operations, research and SEP information systems.

Colin Masson, project manager, Special Projects Division, has been seconded to head up a unit that will coordinate the SEP portion of the UIC Job Creation Program.

Successful candidate in recent competition for administrator, Habitat Management Division, is Ann Gillespie.

Rob Russell, habitat management biologist, will be relocating, efffective October 4, to Nanaimo as part of Habitat decentralization.

Gordon Kosakoski has accepted a six-month secondment as senior habitat biologist in Nanaimo.

Leona Kingston was the successful candidate in the competition for administrative assistant, Licencing. Also joining Licencing is Myra McLaughlin, clerk.

Mark Walsh has been appointed as a seasonal fishery warden in Sandspit.

Joining the Department, as a fishery officer trainee, is Scott Coulist who will be initially posted to Whitehorse.

Marjorie Peace has joined the Communications Branch as a clerk. She will be responsible (among other duties) for loaning A/V equipment, films and slide and video tape shows.

The Communications Branch needs a minimum of one day's notice for loans but recommends one week's notice to ensure the material required is not already booked.

Linda Thorson, Community Development project coordinator, is taking a leave of absence to get her masters degree at UBC.

Bruce Wright, former economist with SEP Planning, has won the competition for the project coordinator with the SEP Community Development Program. He will be coordinating native projects in Kincolith, Masset and Terrace.

Escapement data

A project review committee was recently established to oversee the system development of the salmon escapement data. Its members represent the major branches of the Department. Should anyone like to know more details on the computerization of the escapement files, or wish to provide their comments, please contact your representative or the committee chairperson.

Committee Chairperson	Linda Aaloe
Field Services Branch	Robin Harrison
	Norm Lemmen
Resource Services Branch	Louis Lapi
Salmonid Enhancement Program	Margaret Peters
Support Services	Man Lee Jung

SOUNDER

Volume X Number Seven November 1982

Full bloom on the Adams River

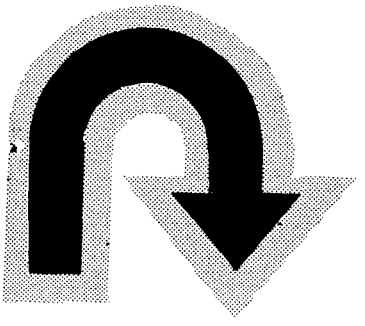
Letters

Director discovered acid rain effects

The report (Acid Rain: the Canadian Experience, September 1982) that in 1966 Harold Harvey introduced 4,000 pink salmon into a small lake is true, but it has nothing to do with acid rain. The experiment attempted to determine if pink salmon could remain in a small freshwater lake. However, in the spring of 1967, the small mesh fence was destroyed by ice and debris, and if any fish remained, they could have easily left the lake. The chemical measurements made by Dr. Harvey indicated the lake was suitable for pink salmon.

It was not until late 1969 that I found out, by accident, that many lakes were acidic and that fish populations were affected by acid rain. Initially, people, including Harold Harvey, would not believe this was possible. Comments ranged from it was "impossible to acidify a lake" to "sports fishermen have caught all the fish."

In 1969, I informed representatives of the Ontario Government and other scientists that there was a problem of acid rain, and I said that I felt a main source of the acid was Sudbury, Ontario. Shortly after, I received inquiries about the possibility of acid rain existing in the United States. The events that followed were both humorous and frustrating. Fortunately, I have



SO_2/NO_x + water = acid rain

saved almost all of the correspondence, and some day, when I have time, I will publish it.

As a director of research, it is important for me to remember that in 1973, when I was a federal scientist, my proposal to work on the effects of acid rain on fishes was turned down because it was considered to be a low priority.

Dr. Dick Beamish
Director of Research
Fisheries Research Branch

Cover photo: Seeing is believing at Adams River, where a dominant run--every four years--of sockeye returns to spawn. More on page 10. Marj Trim photo.

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Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Government of Canada / Gouvernement du Canada
Fisheries and Oceans / Pêches et Océans

The Pearse Report: a summary

Commissioner Peter Pearse of the Commission on Pacific Fisheries Policy released his final report, "Turning the Tide," on Sept. 28. Here is a summary of the 300-page report.

The Resources

The condition of Canada's west coast fish stocks is better than many commentators have suggested.

In the aggregate, salmon stocks are well below their original levels of abundance, but the overall decline has now been arrested or reversed for many stocks, due to improved fisheries management. However, the condition of many chinook and coho stocks causes concern. The immediate cause of continuing declines and low level of abundance is overfishing. Salmon stocks can be substantially rebuilt through better management, more careful regulation of catches, and enhancement.

Herring stocks, for the most part, seem to be healthy. With the exception of halibut and a few other stocks, groundfish are in good condition as well. Stocks of invertebrate species are also, with a few exceptions, in good condition.

Fisheries Management

The most conspicuous weaknesses in our present systems of fisheries management are in our most valuable fisheries--salmon and roe herring. In the groundfish and invertebrate fisheries, pressures on the resources have been limited and, for the most part, managers have been able to assemble sufficient information to guide exploitation and conserve the stocks. However, both salmon and roe herring management suffer:

- from serious deficiencies in long-term planning
- in the quality of data needed for effective in-season management
- in the methods of processing and analyzing information so that it becomes available to managers systematically and quickly
- in the scientific input into management decisions
- in a lack of regular review of plans and results with those participating in the fisheries.

Pearse has made recommendations aimed at correcting these deficiencies.

Habitat Management

The environment that supports our Pacific fisheries is being assaulted from many directions. It is important that the Department recognizes this and also recognizes that this environment is a natural resource that plays an integral role in overall fisheries management. Depleted wild stocks can be restored by more effective fisheries management and certain enhancement techniques, but only if the natural environment is capable of supporting larger populations. Thus, ultimately, the health of the habitat will govern the natural productivity of fish. To protect fish habitat, we need a strong and comprehensive habitat management policy. The Department can achieve this by:

- an explicit commitment to integrated resource planning, development, and management
- ensuring that fish production capability in the region is not diminished as a result of industrial and other activities that impinge on fish habitat
- improving administrative, legal and procedural arrangements.

Habitat management is currently underfunded.

SEP

Pearse has examined Phase I of SEP and found it to be well planned. He recommends that the program be renewed (SEP Continuation), but with a modified mandate and on a more modest scale than originally envisaged. There is a strong suggestion that the Department's ability to produce fish outstrips its ability to manage them biologically and economically. It is to the latter aspects that Pearse's major recommendations on SEP Continuation are addressed. In particular, a cautious approach is dictated by these uncertainties:

- the success of large-scale enhancement works is still unproven

continued on page 4

continued from page 3

- lake fertilization still has to prove itself
- the current pattern of fishing mixed stocks has to be changed to protect wild stocks
- fleet expansion has to be controlled
- it has still to be demonstrated that equivalent benefits cannot be obtained simply by better fisheries management.

Also, it is clearly time to establish a suitable framework for regulatory policy to accommodate new opportunities in mariculture and ocean ranching.

Licencing

The licencing recommendations include three major thrusts:

- elevate licencing to a status consistent with its importance in modern fisheries policy
- advance the licencing arrangements themselves from archaic and demonstrably inadequate forms to ones that will best meet the needs and circumstances of each fishery
- alleviate the serious problems of excess capacity which has hitherto plagued the major fisheries.

A statement of objectives for the licencing policy places emphasis on conservation and economic efficiency. Other government goals, such as employment or protection of special groups, should be pursued through agencies with the mandate to promote these goals; for example, the Canada Employment and Immigration Commission and the Department of Indian and Northern Affairs, and the Department of Regional Economic Expansion. The Pearse recommendations would strip licencing arrangements of their role as tools of social policy except through cooperation with other department's programs.

A hierarchy of licencing arrangements is presented, for example:

- unrestricted entry
- restricted entry
- quotas
- leases to individuals.

Pearse argues that it is necessary to move licencing arrangements as far up this hierarchy as possible. Many fisheries are amenable to quota systems or lease arrangements, and these are discussed in his report. However, for the two major fisheries, salmon and roe herring, it is recommended that they remain restricted-entry fisheries. For these fisheries, unlike quota fisheries, self-regulation leads to less than optimal performance. Thus, government, using new guidelines, must intervene. The problem of excess capacity, which remains unresolved in the restricted entry fisheries, is also dealt with. The whole licencing function and fleet rationalization program in salmon and roe herring would be removed from the Department and vested in a new Crown Corporation, The Pacific Fisheries Licencing Board.

Native Fisheries

1. Commercial fishery

From the point of view of the Indians themselves, as well as the Canadian public, it is preferable to subsidize fisheries programs that will provide productive employment and contribute to individual and community morale, rather than increase subsidies in the form of welfare funds needed to cope with growing problems of dependency, unemployment and demoralization. Sensitive and costly programs are required to successfully increase the involvement of Indians in the commercial fisheries. DINA is best placed to initiate and financially support Indian economic and social development programs. The Department of Fisheries and Oceans must adapt its policies to accommodate these programs without obstructing the objectives of Indian administration or of the Indians themselves.

2. Food fishery

Indian fisheries policy cries out for reform. The objectives of the recommendations are to strengthen Indian fishing rights, to enable Indians to become involved in fisheries management, to

provide Indians with a better opportunity to take economic advantage of their fishing rights, and to improve the administrative and enforcement arrangements.

Sportfishing

It is very important at this time that government policy should explicitly recognize sportfishing as a legitimate, valuable and significant use of fish resources. It is also important for the Department to improve its understanding of the value of sportfishing opportunities and how that value is affected by regulatory change.

Sportfishing policy should be directed at preserving the quality of sportfishing opportunities. This implies several thrusts:

- dampen the growth of sportfishing effort and maintain average catches until the available harvest can be increased
- involve sport fishermen in the design of regulatory arrangements
- support this process by establishing a reliable information system.

Sportfishing management is currently underfunded.

Enforcement

Major restructuring and reorientation of enforcement policies and procedures are required if illegal activities that threaten fish and their habitat are to be successfully deterred.

Public Consultation

Effective consultative and advisory processes are especially important for fisheries. The Department's efforts at consultation, while impressive, are not highly successful. The arrangements need thorough reorganization.

Federal/Provincial

The governments of Canada and British Columbia both have a major influence on the management of Canada's Pacific fish resources. Explicit and mutually agreed arrangements for reconciling their interests are overdue.

Administration

Concerns regarding the Department's organization, financing and personnel were addressed by the Commission:

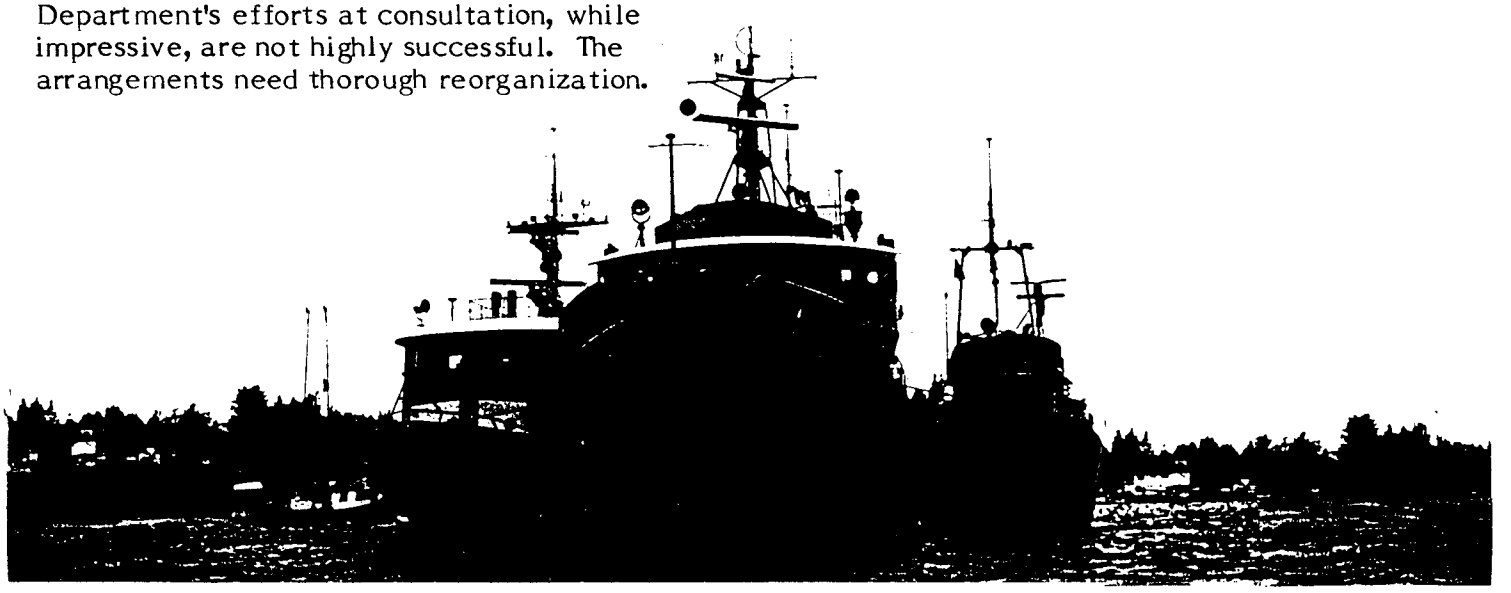
- administration lacks consistency and vigor
- policy decisions are pliable in the face of lobbying and other pressures
- unresponsive to urgent needs, in particular necessary changes in regulations.

Yukon

The fish resources of the Yukon have not hitherto received the attention required to assure their proper conservation and management. Many of the present deficiencies are a result of awkward administrative organization and insufficient support. Current knowledge of fish resources is inadequate and a much more aggressive approach has to be taken toward environmental management.

Legislation

Fisheries policy is embodied in federal legislation, ancillary regulations, fishing licences, and administrative policies and procedures. Implementation of Pearse's proposals will require changes to all of these policy instruments in varying degrees.



Acid rain: part three

From western skies

This is the last in a series of articles on the acid rain problem.

In our neck of the woods, acid rain is commonly considered an eastern problem, but Environment Canada estimates that 45 percent of British Columbia is receiving acid precipitation in the range of pH 4.5 to 5.5.

Information points to potential acid rain concerns in the Queen Charlotte Islands, Prince Rupert and the lower mainland. Precipitation maps show these areas to be receiving rainfall with an annual average of pH of 5.0, and soil maps show soil acidities generally less than a pH of 5.5. In the lower mainland and Prince Rupert, industrial sources of acid rain contaminants are prevalent. In the Queen Charlottes, there is concern that Consolidated Cinola Mines Ltd. may adopt an ore-roasting process that could release sulphur dioxide, nitrogen oxides, and metal contaminants.

Habitat Management's consideration of acid rain concerns came to a critical focus last year. In 1981, B.C. Hydro released the Hat Creek Project Environmental Impact Statement, describing the proposed 2,000 megawatt coal-fired electrical generating plant near Cache Creek. Actual consideration of the project by B.C. Hydro began in 1957. A preliminary environmental impact statement was released in 1975, and the detailed impact assessment was commissioned in 1976.

It was clear by 1981 that development and use of the relatively low grade Hat Creek coal deposits could release substantial quantities of sulphur dioxide and nitrogen oxides. Weather patterns would distribute this material predominantly northeast and east of the site. Although waterbodies within 50 km of the site would be subject to the greatest depositions, these drainage systems are relatively well buffered by carbonates. Systems at intermediate air transport ranges up to 200 km away have lower alkalinities and are considered to be more susceptible to acidification.

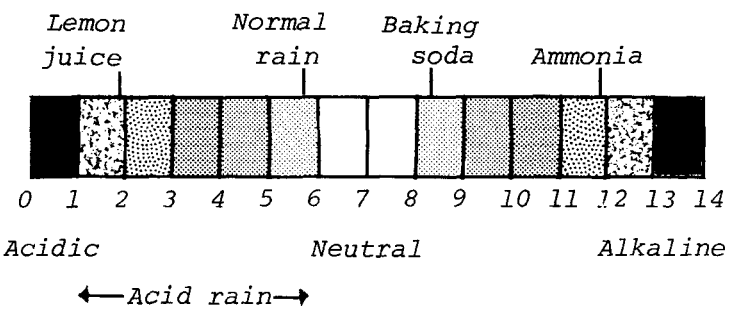
A sampling program for waterbodies at these intermediate distances was established in May 1981 by the Department and the International Pacific Salmon Fisheries Commission. Sensitivity mapping based on salmon stocks, soil types and available water quality information had identified 25 representative headwater drainage systems for preliminary sampling, extending from Williams Lake, east to Blue River and south to Salmon Arm.

The Hat Creek sampling trips were 2500 km in travelling distance. One set of sample sites east of Salmon Arm was closer to Calgary than to Vancouver. The typical four-day trip included a lot of four-wheel drive and winch roads, often impassible in the winter.

Water samples were taken in June, at the end of the spring melt, and in September, during low flows. Water samples in January provided information on groundwater-fed stream flows. Snowpack acidity samples were taken at the beginning of March. By this time, the original 25 sites had been pared down to 15, based on a continuing review of the water quality data.

As the results came in, it was clear that sampling in the snowmelt period would be critical to our understanding of the expected spring pH depression. Buffering capacity had increased slightly over winter, but snow samples had a pH as low as 4.9. A final trip at the end of March was too early to catch the spring melt.

The pH scale



The pH scale, used to measure soil or liquid acidity, ranges from 0 (maximum acidity) to 14 (alkaline). A value of 7 is neutral. Because the scale is logarithmic, there is a tenfold difference between one number and the one next to it.
The pH of normal rain is 5.6, slightly acidic, due to the presence of carbon dioxide in the earth's atmosphere.

The fishery officers of Clearwater and Salmon Arm carried the program through the critical snowmelt period. Water samples for acidity and alkalinity were taken from the Raft and Eagle Rivers on a weekly basis and shipped to the IPSFC lab at Cultus Lake for analysis. In March, the pH values from the Raft and Eagle Rivers were 7.53 and 7.25, respectively. At the end of April, pH values began to drop in these systems. By the second week of June, the rivers had pH values of 6.6 and 6.7. The acidity of Raft River had increased 8.5 times the pre-melt level, and that of Eagle River had increased 3.5 times.

A north coast sampling trip in June 1982 demonstrated low buffering capacity in ten streams on Graham Island, (QCI) and pH values as low as 5.58. All 11 streams sampled in the Prince Rupert area had low alkalinity values. Five of these streams had pH values less than 6.5, the acid level previously implicated in trout egg mortalities. Department sampling has not been undertaken in the Lower mainland, but rain gauge water sampled by a provincial agency in Burnaby had a pH value of 3.95.

A report, in preparation, will summarize the sampling program results to date. Additional water and snow samples collected this fall and winter from the Prince Rupert stream systems will determine if the low pH values for the streams in that area are natural or are due to snow contamination. It's possible that Prince Rupert area salmon stocks may be uniquely adapted to naturally occurring acid conditions.

Interested parties throughout the Pacific Region are invited to take part in the acid rain program, by incorporating acidity and alkalinity sampling into field surveys or site inspection trips. Arrangements for equipment and processing can be discussed with members of the Water Quality Unit of the Habitat Management Branch.

At last word, B.C. Hydro has shelved the Hat Creek proposal which spawned the Department's stream sampling program. The scheme has not been abandoned; it only awaits sufficient power demand forecasts generated by an economic recovery. So tonight, turn off the extra lights.

Jim Morrison
Biologist
Habitat Management

Top, Hat Creek area and, below, B.C. Hydro employee checks rainwater run-off monitor.

Employee assistance on a personal level

The belief that a person leads two lives, a home life and a work life, is no longer commonly held. Personal and professional problems can affect the same person; they are inter-related and often inseparable. Recognition of this has led the Department to establish the Employee Assistance Program (EAP), a confidential service offering personal counselling, assistance and, where needed, rehabilitation.

The objectives of the Employee Assistance Program are neither "pro-management" nor "pro-union", but rather "pro-people." The Program has been established after consultation with union representatives and has the support of both management and union. The benefits sought are improvement in work performance, reduced absenteeism, reduced staff turnover and reduced accidents.

Typical problems may be a minor or acute physical illness, grief, alcohol or drug abuse. The Program is directed toward assisting employees with any particular health or behavioral problem which results in impaired work performance. Experience indicates that many of the underlying problems identified will be alcohol-related, although there may be other health problems. If an employee has an underlying alcohol problem and voluntarily seeks help under the program, assistance and counselling can be provided more easily at an earlier stage than he or she coerced into participation during the later and more chronic stages of this illness, when rehabilitation is most difficult.

During rehabilitation, an employee is entitled to receive benefits, and consideration for other illness and sick leave will be approved where credits are available.

Regardless of the nature of the problem, the strictest confidentiality is assured.

All staff are encouraged to seek early assistance or advice on problems that are of concern to them. A major role of the EAP advisor is to help employees to clarify a problem and to assist in seeking a solution. The advisor is aware of the counselling and health/medical services of Health and Welfare Canada and of Community agencies and resources which offer the appropriate assistance.

In most instances, people can overcome personal problems independently and there may be no adverse affect on work performance. In many other instances, assistance of a supervisor will resolve problems so that there will not be a drop in job performance. There may, however, be personal problems of such a nature that employees do not wish to discuss them with a supervisor but feel the need to discuss them with someone before work performance is impaired. The EAP advisor provides a neutral zone for such counselling.

All information concerning personal problems, and any rehabilitation program undertaken, are kept confidential, whether you voluntarily seek help or are referred by a supervisor because of health and behavioral problems affecting work performance. No information will be released without your written permission. All information concerning participation in the program will be held in a separate EAP file which will be accessible only to the EAP advisor. When referred by a supervisor to the EAP advisor or regional co-ordinator, you can request the attendance of your union representative and can also request such

Canada savings bonds

A Canada savings bond is an extremely safe form of investment backed by all the resources of Canada. Add to this the convenience of the payroll savings plan, and you have an excellent way of saving and investing money.

There are two methods of purchasing Canada savings bonds. Cash purchases can be made through your local bank or other financial institution. Both regular and compound interest bonds may be purchased using this method. Purchase of Canada savings compound interest bonds may be made by regular deductions from pay using the government's deduction plan. Regular interest bonds may be purchased using cash only.

The compound interest bond offers a very attractive method of earning interest on interest at a guaranteed reinvestment rate. The interest accumulates and is paid only when the bond is

attendance at any interview involving the review of an established rehabilitation program.

Voluntary EAP advisors are available at several locations to assist in the program. If you do not have one in your location and feel that assistance is required, get in touch with the regional EAP coordinator, Personnel Branch, at 554-1998.

Copies of the booklet "Employee Assistance Program - Policy and Procedures" are available on request from the Personnel Branch.

Jim Griffin
Staff Relations Advisor
Personnel Branch

EAP Advisors

Field Services Branch
Suzanne Benoit
Brian Richman

Fisheries Research Branch
Dorothy Kieser
Ruth Szablowski
Bill Damon
Frank Velsen
Jon Schnute
Kees Groot

Support Services Branch
Art Chambers
Sharon Henderson
Gordon Nelson
Jim Brennan
Phil Lloyd

Small Craft Harbours
Stan Wallace

remain a secure investment

redeemed or at maturity. When cashed after December 31, 1982, all regular annual interest plus all compound interest earned will be paid for each full month which has elapsed since November 1, 1982. If cashed on or before December 31, 1982, the bonds will be redeemed at face value only. The minimum denomination for the compound interest bond is $100. It can be purchased for less than 30 cents a day on the payroll savings plan.

The payroll savings plan provides for three basic periods of 11 months, ten months, and nine months, when deductions are made. The final payment is deducted from the second paycheque in September, 1983. In each case, the deductions taken on the payroll savings plan include interest calculated from November 1, 1982 on the outstanding declining balance. Interest charges paid on the purchase of Canada savings bonds through the payroll savings plan are tax deductible.

The new series of Canada savings bonds will pay 12 percent interest the first year. The rate of return on all outstanding issues of Canada savings bonds has been increased to 12 percent; from 10.5 percent, for the year commencing November 1, 1982.

For the new series, the annual return after the first year has been set at a minimum of 8.5 percent. For all outstanding series, the minimum annual return of 10.5 percent continues to apply for the period from November 1, 1983 to maturity. The new series matures November 1, 1989.

Edie Preugschat
Personnel Services Officer
Personnel Division

More than 200,000 visitors witness fu

The Adams River sockeye run is one of nature's most spectacular events. It symbolizes a universal theme of creation through destruction.

Every four years, a dominant run of sockeye salmon begins a journey through the sometimes calm, and often turbulent, waters of the Fraser River to reach its spawning grounds on the Adams River, which flows between Adams Lake and Shuswap Lake in B.C.'s Interior. The fish travel 500 kilometres, not eating, but living off the food of their own bodies. The sockeye undergo a gradual metamorphosis, from silver-bright to ugly red fish. The males develop green hooked snouts and swollen humped backs. Males and females are often battered against rocks and scarrred from battles with other fish as they jockey for a position and fight for a partner in the final episode of their life cycle.

A mating ritual follows for those sockeye that make it to their chosen site on the spawning ground. The male pairs off with the female. While the female builds a nest, her mate protects their territory by fighting off intruding, unpaired males. As the eggs are being laid in the spawning gravel, the male fertilizes them with his milt. The female goes on to build other nests and lives for a few more days to protect them. The male may spawn again, but generally does not survive much longer than a week. Their mission accomplished, the partners die--by the millions. Decaying bodies litter the waterways.

If the conditions are right, most of the eggs will eventually hatch and the cycle will be repeated.

The Adams River run is an event which not only captures the public's imagination, but gives those witnessing it a dose of reality. It is a statement about the fragile balance between life and death, about harmony with nature, and the need to protect, conserve and enhance the resource.

The Salute to the Salmon Committee, consisting of the Fisheries Association, the provincial Ministry of Lands, Parks and Housing, the International Pacific Salmon Fisheries Commission and DFO, was instrumental in providing the public with an understanding of the Adams River run on-site in the Roderick Haig-Brown Conservation Area.

Joe Arseneault, who has had much of the responsibility of setting up the site for the public

Life and death on the Adams River: an estima

during the last 16 years, says although there are often obstacles to overcome, it's always a positive experience.

"I have a certain amount of pride in being here," he states. "As far as public involvement is concerned, I think this is always positive because if we can teach the public to respect these fish and to look at them as animals and not as a slimy fish they get out of a can, it makes our job much easier."

Joe says children are particularly responsive to the Adams River spectacle. "They leave here with a feeling they have seen something, they have learned something," Joe says. "I think it

ll bloom on the Adams River

ed 1.5-2 million sockeye spawned in October.

makes them better citizens, and more conscious of the environment we all live in."

When he wasn't working on the site construction, handling media interviews, or keeping the exhibition tent from blowing away in the windy, rainy weather, Joe was dealing with the public and various officials. His knowledge and his understanding of seeing the Adams River run and its significance meant he was able to respond easily to the numerous questions and inquiries.

"I've been working 42 years and I always put a lot of effort into the work I do to learn something from it," he says.

Joe Arseneault

This year, approximately 200,000 visitors benefited either directly or indirectly from the experience of seeing the Adams River run and from the efforts of Joe Arseneault and the Committee.

David Procter
Media Relations Officer
Communications Branch

Organizers saluted

To The International Pacific Salmon Fisheries Commission:

Having just returned from visiting Adams River to see the phenomenal salmon run, which must equal any modern miracle, we would like to say a very sincere thank you to the International Pacific Salmon Fisheries Commission and staff for the literature we received, which helped us understand the life of the salmon and the aims of the Commission. For the splendid arrangements at the Adams River--for the viewing platforms, railings, facilities, for the directing of traffic on approaching roads and the parking, and at the same time, keeping thousands of viewers of all ages under easy and complete control, a salute to the organizers is certainly due.

Thank you again from two appreciative viewers.

George and Lena Clack
Burnaby, B.C.

Ripe for change

It is time we in the Department of Fisheries and Oceans rethink our fisheries management policies and practices as they relate to the fishermen. I have the advantage of being in the midway position of a field officer with an unusual opportunity, living here in Alert Bay, for seeing both sides. Perhaps I can shed some light on part of the problem and offer a solution.

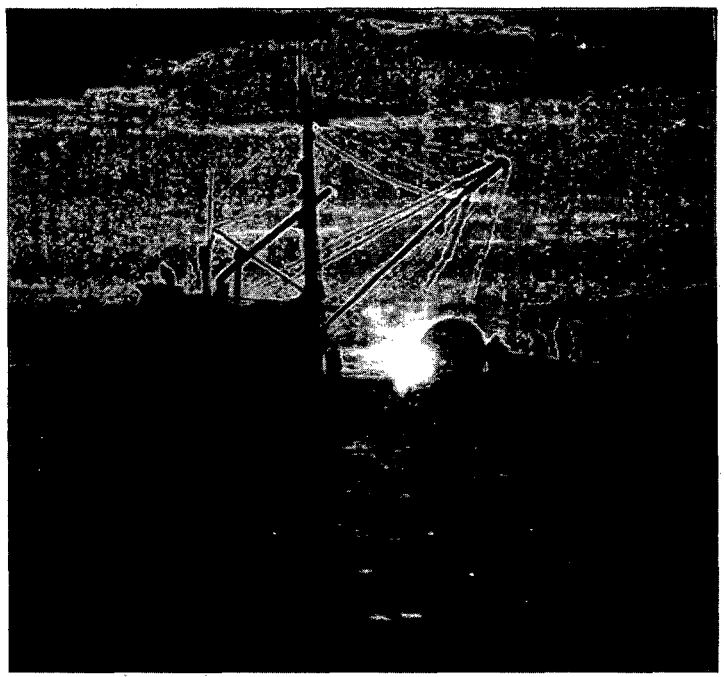
The commercial salmon fishermen in Alert Bay want a real voice and a hand in the management of their future; the fisheries in their area. I believe they are ready for it. Perhaps the time is ripe for this concept to be adopted coast-wide.

The time is past when Department staff can formulate and carry out fisheries management plans based solely on statistical biological data and local officer's observations. These actions can no longer be done in isolation from area and time-specific, on-the-grounds information recorded in volumes over the years in the minds and log-books of the fishermen. No longer should local officers have to bear the brunt of fishermen's frustrations and resentment of paternalistic policy, while the Department tries to ram fishing plans down the throats of the fishermen, bypassing their brains. All people like to think about, understand and choose for themselves what they must swallow. Everyone likes a say in the way he does his job (see Bryan Spikes' Boss Is a Four Letter Word).

The time has come for management plans to be established using statistical formulas and data as a baseline. These plans should then be the subject of Department meetings with fishermen and field officers, for discussion of these baseline formulas to the satisfaction and understanding of all involved. People who have had the chance to provide input and to hear good reasons why or why not, may not necessarily support a plan, but will be less inclined to strongly oppose it.

The next step after implementation is a continual reevaluation and, as necessary, revision of these fishing plans (involving fishermen and local officers) on a day-to-day, week-to-week basis on the grounds, as the catches continue and escapements are approached.

Fishermen aren't fools. They too have computers. They are intelligent people; most are honest and responsible conservationists. They resent having unproven figures, prepared in



What lies ahead for B.C. fishermen?

isolation, held up to them as indisputable facts and forced upon them as though they were children incapable of understanding or having a part in their own destinies. Fishermen have a tremendous amount of knowledge to offer and are ready to take a share in the planning and responsibility for fisheries management. To date, we fishery managers, who have been running the show, have had no accountability for overescapement potentialities. In fear of irretrievable losses to their income, the fishermen have lobbied for openings and won them. Sometimes this has resulted in underescapements.

Fishermen, in these instances, have tended to blame the Department for succumbing to pressure, despite greater knowledge of the dangers involved. The fishermen have been able to safely and truly plead innocence for their actions in such cases, because we've carefully kept them in the dark and out of the planning exercise.

Department personnel resent having to accept the blame for all mistakes. They respond with increased mistrust and even less desire to involve the fishermen in planning processes.

I might say to Fisheries management:

Don't judge all fishermen by those you may have dealt with before, such as those representing fisheries organizations and large financial

interests. Take a real look at and listen to the grass-roots fishermen in the small coastal communities. They are, for the most part, good, honest men who know about fishing and care about conservation. Once we've involved these fishermen in the planning and management processes, their natural conservationist instincts and understandings will be whetted and a new and much more effective police force will be born.

To fishermen:

Perhaps the Department isn't evil and manipulative by design. It may just be bearing the burden of responsibility for conservation it believes it must carry alone. It is simply going about it in the best possible manner against impossible odds under the present management system.

Fisheries managers aren't horrible people; we've just never had to account for the socioeconomic impacts of our conservation strategies. Accountability is important. Without it, the process of properly recognizing errors and revising plans of action is extremely difficult.

Perhaps we could try a bit more honest communication and a bit more trust within the Department as well as between the Department and the fishermen, on a regional basis. The practice has produced a marked improvement in management effectiveness here in District 5 over the past two sockeye seasons. (See my Sounder article, entitled "Fishery huddles provide insight and feedback," of March 1982.)

In general, I don't think our present system of fisheries management is working very well on the divisional and regional level. We're ripe for change.

Bruce McDonald
Fishery Officer
Alert Bay

Job creation funds can help

"Look, this is our busiest time of the year and we simply don't have the time to take on any additional help."

That was the response of staff in one district when offered workload assistance through the new Unemployment Insurance Commission (UIC) and departmental Job Creation Program. For those who find themselves in a similar catch-22 situation, cheer up; the Job Creation Program is here to help, not to hamper.

"Some say, 'Oh no, not another makework program,' but we like to think that it's a little different," says SEP Job Creation Coordinator Colin Masson.

"The mandate from Ottawa is to create work, but we're really here to help Fisheries through a variety of salmonid enhancement activities, enumeration and other activities for fishery officers and biologists, and so on. The challenge is to create work that is beneficial, and that's why we ended up with the kind of group we have."

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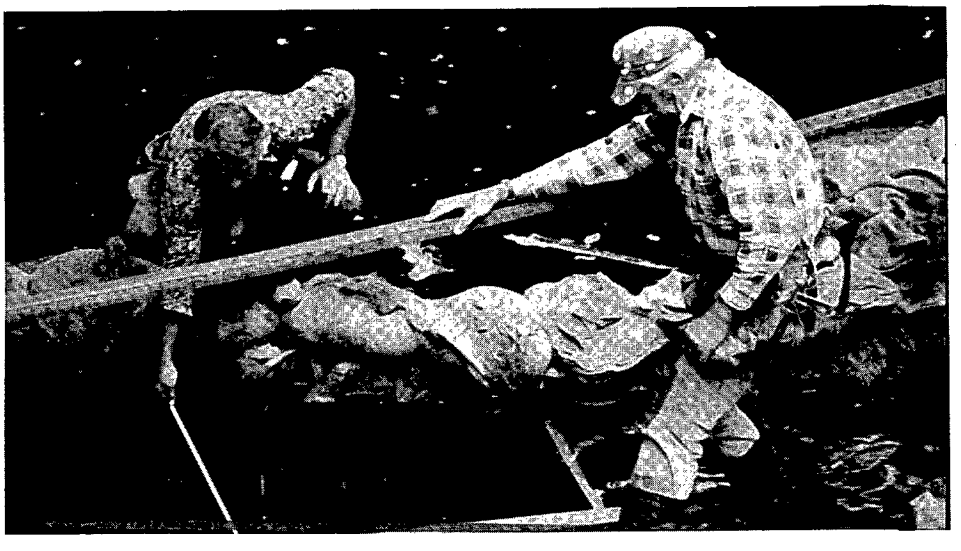

Two UIC workers make preparations for construction of a fishway on the Millstone River in Nanaimo.

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Working for the SEP Job Creation program in Vancouver (666-2570) are two fisheries biologists, two engineering support staff, and five project developers. So far, they've hired 531 people to work on 70 fisheries projects throughout the province. When the program moves into full gear, it will have found work for 800 people.

Lorne Hawrelak is in charge of hiring for the Field Services Branch, the Habitat Management Branch and the Resource Services Branch. Some of the jobs filled in these branches include International salmon tagging, a Yukon lake inventory, a Queen Charlotte Island stream and slope rehabilitation study, herring tagging and invertebate sampling and data analysis. This portion of the program is currently awaiting new funds.

In addition to the workers' wages (paid by UIC at $240/week), the department pays program support costs, which include a wage supplement for managers and supervisors, materials, and transportation expenses--up to a maximum of $100 a week per person. Currently, UIC workers are involved in projects such as:

- logjam removal
- stream cleanup
- flow control weirs
- brood stock collection
- habitat investigations
- stock assessments and enumeration
- egg takes at small scale incubation projects
- fishway repair and maintenance
- boulder placement
- anti-erosion transplants
- data processing
- writing reports.

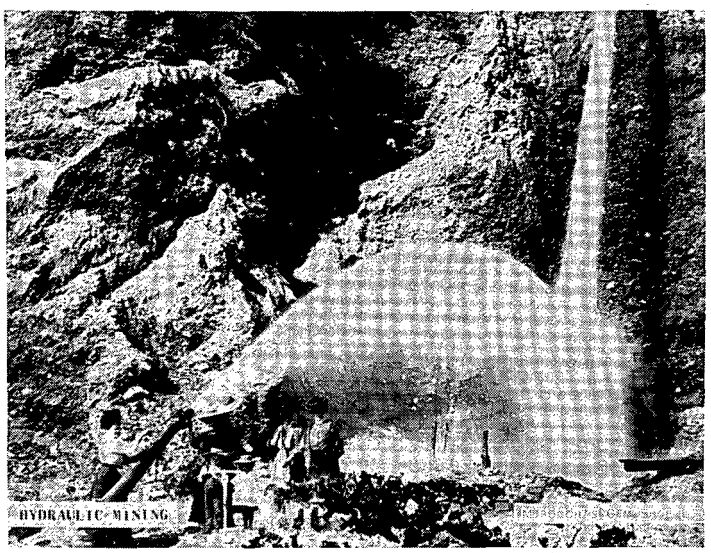
The program also has a mandate to provide work for native Indians and unemployed fishermen. Colin says there may be more benefits in the future.

"The fact is that you can foster a greater awareness of the resource when you have a project. There are more people involved. In some communities, that really amounts to a substantial benefit."

Mike Youds

Regulating the unregulated

Gold was first reported in the Yukon as early as 1850, when Hudson Bay explorer Robert Campbell spotted gold on a gravel bar at Fort Selkirk (on the Pelly River near the Yukon River confluence). Placer activity did not develop in a major way, however, until 1896 when George Carmacks discovered gold on Bonanza Creek and sparked the great Klondike gold rush of 1898. Since that time, very little control has been exercised over this industry, and today, Yukon placer mining is probably the least regulated industry in Canada.



Early placer mining in the Yukon resulted in stream destruction still in evidence today.

The impacts of placer operations on fish habitat are very severe. Placer operations often eliminate very long stretches of streams in order to reach the "pay-streak." Total stream flow is often diverted through operations. These operations also release very high sediment loads into downstream reaches, with concentrations of many thousands of mg/l of suspended solids being the rule rather than the exception.

The increase in gold prices in recent years has led to a major expansion in the number of placer operations. The Department of Fisheries and Oceans, Department of Environment and Department of Indian and Northern Affairs recognized the need to develop guidelines to minimize environmental damage resulting from this expanded industry. In December 1981, a joint DFO/DOE position paper was released which

proposed a stream classification system, operational standards and compliance schedule for their implementation. Although the above elements have been modified and refined in the intervening period, the basic principles of that paper remain the same, namely:

1) Placer mining must be regulated to protect habitat and associated resources.

2) Effective monitoring and surveillance programs must be carried out.

To facilitate the stream classification process, the system designates fish species as either schedule I or schedule II. Schedule I fish species are gravel spawners (salmon, trout and others) whereas schedule II species are broadcast spawners (arctic grayling, for example). The streams in the placer areas of the Yukon have been classified according to fish utilization or the fish habitat potential. Within each classification, placer activities will be subjected to appropriate operational requirements. There are five classifications:

1) "A" streams are those with demonstrated or potential schedule I spawning. Very important schedule II streams may also be given this classification.

2) "B" streams are utilized for rearing by schedule I species.

3) "C" streams have high utilization by schedule II species.

4) "D" streams have low or no utilization by any fish species.

5) "X" streams are presently designated placer streams: Bonanza and Eureka Creeks, for example. (There are a total of 24 placer streams in the Yukon.)

The Department has completed the task of mapping and classifying all Yukon streams based on available data. Where data are lacking, district staff have had to give a subjective designation. The placer miner will have an opportunity to challenge the classification of a stream reach should he wish to do so. The miner will, however, be required to collect the biological and physical data necessary to permit our reevaluation.

The guideline package is now complete. It will be distributed to various interest groups and government agencies, such as the Klondike Placer Miners Association, the Yukon Conservation Society and the Yukon Territorial Government, in preparation for public hearings which will likely occur in late November 1982. While we anticipate considerable debate regarding these guidelines, it is our hope that they will be implemented for new operations as early as the summer of 1983.

Steve Macfarlane
Senior Project Manager
Land Use Unit
Habitat Management Branch

Exploring the terminal alternative

In the July-August Sounder, the Director of Regional Planning, Al Wood, wrote about the general goals of his regional planning group ("Pacific Region planning: working as a whole"). This article describes how Wayne Holmes contributed to the specific goal of preserving wild stocks of salmonids.

One of the regional goals is to preserve the natural salmonid production of weaker stocks, which are being overfished in mixed-stock fisheries. A way to alleviate mixed-stock management problems is to hold terminal fisheries (sometimes called end or clean-up fisheries) after the stocks have separated. That way, fisheries will be targeting on a known, distinct stock. However, there are many factors--ranging from fish quality to regulation, conservation, and inspection--that must be considered before implementing terminal fisheries on some stocks.

In late summer 1981, Wayne Holmes of the Fish Inspection Division (Victoria) was seconded to the Regional Planning Group. His task was to address the various quality factors which may be evident when salmon are harvested in terminal fisheries.

MATURATION OF STOCKS

One of Wayne's tasks was to determine the maturation of salmon stocks in relation to the various fishing locations. (Salmon, as they proceed along their migration route, become progressively more mature. They are at their highest quality in the seaward locations and at their lowest quality on the spawning grounds.)

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Wayne made numerous field trips to view samples firsthand to determine maturation characteristics such as scale loss, odor, skin color, and flesh color and firmness. Then, armed with salmon quality information provided by industry, departmental researchers and scientists, fishery officers and native food fishermen, Wayne was able to profile the maturity of numerous stocks taken throughout the province.

For several selected stocks, Wayne then determined the areas where the run advanced from one quality to the next, as it moved along its migration route.

In so doing, he graphically outlined areas where a fishery could be held to target on a stock when it was of a particular quality. This information will assist fishery managers in planning their fishing strategies. Managers will be able to reduce mixed-stock harvesting problems and still be able to obtain a catch of marketable quality.

Terminal and mixed-stock fisheries: "It's not an all or nothing approach."

"It's not an all or nothing approach," Wayne says, meaning that both a terminal fishery and a mixed-stock fishery could still be held. Managers could hold fisheries in the various quality or grade areas. In the more seaward areas where the salmon are graded highest, a portion of the catch could be taken in a mixed-stock situation. Fisheries could then be held in successive quality areas; as the stocks separate, greater portions of them could be taken in rather discrete fisheries.

CANNED SAMPLES

Wayne also obtained 17 samples of fish during his visits to the district offices. These fish were canned and yielded some interesting results.

Mature fish yield marketable product

One of the most promising samples was that taken from very mature sockeye caught at Fraser Lake, quite close to their spawning grounds. In spite of the advanced maturity of these fish (they had a thick, red skin with no scales), they yielded an acceptable canned product (Grade A). "I was very surprised to get an acceptable canned product from those fish," Wayne says. "I didn't really expect to get a Grade B product, either," he adds. The sample didn't have the "late" odor (a swampy, musty smell) that is characteristic of a mature fish; the only drawback to the sample was the bright red skin, which consumers may find objectionable.

However, even this problem may one day be solved; a potential processing alternative could be on the horizon.

Skin removal: a potential processing option?

Wayne investigated what just might prove to be a valuable processing option for very mature fish: skin removal.

One of the biggest problems of canning mature fish is the "late" odor; this odor can downgrade the product or, in extreme cases, cause it to be rejected. Because evidence from industry indicates that the skin may be at least partially responsible for the odor, Wayne had mature samples canned, one with the skin left on and one with the skin removed. The sample canned with the skin left on had a strong odor and received only a Grade B rating (generally considered unsuitable for the Canadian or European markets). However, the skinless sample had a neutral odor and received a very good rating (acceptable or Grade A).

The results from these two samples, in particular, are very supportive of terminal fisheries. If these mature fish can yield a marketable product, then there may be many more opportunities for river fishing without a significant loss of quality. For instance, Wayne says, "There may be an opportunity to fish the Early Stuart run all the way up the Fraser and some Babine stocks well into the Skeena."

PARASITES: TERMINAL FISHERIES SAFEGUARD MARKETABILITY

Wayne also looked at the problem of fish parasites in relation to salmon quality if infested stocks are caught terminally. He noted that terminal fisheries may be the ideal method of harvesting stocks that are heavily infested with Henneguya salminicola--the parasite of main concern in B.C.

H. salminicola appears as small, ugly white cysts (up to one cm in diameter) in the flesh. Although the parasite is harmless, it's unsightly and, once the fish are filleted, highly visible. Therefore, there has been some consumer resistance to infested fish when they're marketed whole (fresh or frozen). As a result, importing countries have been known to reject a portion of a shipment or entire shipments.

However, if infested stocks are fished terminally, after they have separated from other

stocks, their end-use could be determined according to the degree of infestation. Heavily infested stocks could be canned to avoid market complaints; both the cysts and the accompanying softening of the flesh would be less noticeable in the canned product. Processors could then choose least parasitized stocks for the fresh-frozen market.

Coastwide, numerous stocks are known to be infested with H. salminicola. The degree of infestation ranges from mild to heavy; cysts may number as few as one or two per fish or as many as 400 to 500, or more. Wayne says that although some stock identification has taken place, more is needed to determine the overall extensiveness of this parasite and the average occurrence of cysts in each infested stock.

INTERNATIONAL AGREEMENT

Wayne noted that terminal fisheries could have other benefits. For instance, terminal fishing also has international implications. If both Canada and the U.S. agree to fish certain stocks after the stocks have separated and have reached their home waters, each country will get the full benefit of its own fish production.

SALMONID ENHANCEMENT PROGRAM

Terminal fisheries can--and--do--work. For a number of years, terminal fisheries have been held to reduce mixed-stock management problems involving enhanced stocks; surplus fish have been harvested in terminal fisheries near the Capilano, Big Qualicum and Robertson enhancement facilities. And, in the future, terminal fisheries could play an even larger part in the management of other enhanced stocks which have precipitated new, or worsened existing, mixed-stock fishery problems.

Terminal fisheries may reduce mixed-stock management problems.

Although there are numerous factors which support the feasibility of holding more terminal fisheries as a method of reducing mixed-stock management problems, there are some drawbacks to the terminal fishery as a management tool.

QUALITY IMPROVEMENT PROGRAM

The use of terminal fisheries, which may mean an attendant loss of at least some fish quality, seems to be in direct conflict with the Quality Improvement Program, whose overall goal

What will terminal fisheries mean in terms of fish quality and marketability?

is to achieve a higher grade product. However, Wayne doesn't see it quite that way. He figures Fisheries managers and Inspection can and should compromise, "We have to compromise about terminal fisheries and product quality; if we don't, some natural stocks are going to be lost because of mixed-stock management problems." Wayne points out that although terminal fisheries may mean some quality is sacrificed, the improved handling, transportation, and storage practices recommended by the Quality Improvement Program would help to ensure that the quality of the terminal catch does not deteriorate further, after the fish have been landed.

MARKETING POTENTIAL

What will terminal fisheries mean in terms of fish quality and marketability? Because of their greater maturity, most fish caught in terminal fisheries will probably not be suitable for the preferred, more lucrative fresh-frozen market. However, these fish can be canned, and Wayne says that there are markets that are not yet fully developed for some salmon products. For instance, smoked salmon: terminally-caught fish that are suitable for canning should also yield a good smoked product. And fish that aren't suitable for canning or smoking may be used in other ways; fish paste, sausage, and flakes are

continued on page 20

Leavenings

Special issue of *Salmonid*

The January issue of "Salmonid" will be a special one devoted to children of elementary school age. It will contain puzzles, games, stories and a poster contest. Extra copies of this issue will be printed so that teachers, or Fisheries staff who are asked to speak to this age group, may order class sets or extra copies.

To place an order, or for more information, please call Maxine Glover, 687-1442, or Rita Morris, 666-3662.

Fishermen's Newsletter

The next issue of the Fishermen's Newsletter will be published in late November or early December.

1983 Sportfishing Guide

The upcoming British Columbia Tidal Waters Sportfishing Guide will be distributed in January 1983. The Sportfishing Guide, and the annual sportfishing licences issued in January, will be effective from January 1983 to March 31, 1984. This 15-month period will accommodate a change in validation period from calender to fiscal year, a change considered desirable in light of the fact that gazetting (legalization)of sportfish regulation amendments does not occur until late March of each year.

Scale lab display

During the Thanksgiving weekend October 9-11 the fish morphology lab had a display in the Art, Science and Technology Centre at Granville and Dunsmuir in Vancouver. The display was a "hands on" type, geared to the general public, especially children. Photo samples of enlarged scales from various species were displayed. Actual scale sampling was demonstrated, with various persons trying their hands at mounting, pressing and then seeing the results on microfiche readers for aging. Two microscopes were also set up, showing otolith and fin-ray sections. The display was very well received, mainly by tourists and the many children visiting the museum.

Yvonne Yole

Fishways and Heath trays

Nicknamed the "ET AV," the enhancement techniques audio visual is now ready, in slide show and video format. "Fishways and Heath Trays" is aimed at the general public. The liberal use of cartoons helps to explain, in a lighthearted way, most of the enhancement techniques in use today.

About 13 minutes long, it is designed to be used by Fisheries or Fish and Wildlife Branch staff in presentations to lay audiences. Fact sheets, one called "Spawning Channels," and a second, "Fishways," would be useful material to accompany this audio-visual presentation.

Copies of the slide tape or videotape are available on loan from the Communications Branch, 9th floor, 1090 West Pender Street, 666-1384. Sets of the fact sheets are available from Rita Morris, Public Involvement Program, SEP, 6th floor, 1090 W. Pender Street, 666-3662.

Management area charts

The 1983 Commercial Fishing Guide will not contain maps or charts of the new management subareas. Instead, a separate booklet of charts will be issued as a supplement to the guide, each page showing a specific section of the coast with its associated subarea units. The large, 17" x 22" size wall charts of the north and south coast, with associated management subareas, may also be produced in limited quantities.

Display questionnaire

A questionnaire was sent to employees who staffed the 1982 PNE display booth, and the response rate has been good. Answers to questions regarding public reaction to the "Habitat Under Pressure" display, and DFO displays in general, have given staff in the Communications Branch and SEP Information valuable insight into how to increase the effectiveness of future public displays. Thanks to all who took the time to respond.

Old friends: where are they now?

When one has been with the Department for 31 years (I started on April 2, 1951) people often ask," Have you seen so-and-so," or "do you know how so-and-so is doing?"

Before I returned to Nanaimo last year, I was asked if I would like to find out what our retired people were doing. I have finally answered this request, so to all of you retired departmental people who get the Sounder, please write to me. My address is: Pat Phillips, c/o Dept. of Fisheries and Oceans, 60 Front St., Nanaimo, B.C., V9R 5H7.

While on holidays in August, we stopped in to see Jim Connor. Jim had a guest, Ed Christiansen, so an enjoyable afternoon was spent reminiscing.

Everyone who knows Jim has probably heard about his plans for a cabin in the Shuswap area (Celista, which to me, is way out in the wilds). Jim's cabin is his pride and joy; a very comfortable domain, built by himself. He does have electricity, running water (a nearby stream) and a toilet down the way (missing a carved moon because there is no door). Jim gardens and cuts wood to keep the place warm. His vegetable garden was a bounty of good things to eat, and he was happy.

From right, Jim Connor, Ed Christiansen and friend.

Ed Christiansen is now in Cardston, Alberta (the city of Mormons), and at the time, he was headed to Kitimat for a visit. Incidentally, he drives a green truck. Ed enjoys hunting and fishing and finds his spare time is all used up doing the good things in life.

It was so nice to see both of these friends.

Pat Phillips
Decentralization Projects
Nanaimo

What you can expect

by Pat Phillips

All employees should be aware that the meal/incidental expense allowance and mileage rates have been raised effective October 1, 1982. There has been no change in the private accommodation allowance.

There still appears to be a problem with employees not submitting Workers' Compensation form 7 to their supervisors if they are injured on duty. The doctor submits a bill to Workers' Compensation, and we don't know a thing about the injury. By the time it goes the full circle back to us--the employee could have forgotten the time, the place and in some cases, what happened. The B.C. Medical Plan does not automatically pay medical bills for injury on duty. If this injury is reported as occurring on the job, then the doctor's office completes a WCB form and sends it with the invoice to the Workers' Compensation Board. The employee should then receive a WCB form 6, which tells his story to the Board. The form must be completed, along with form 7, Employer's Report of Accident for the Employer. Remember that on the WCB form 7, your occupational group and subgroup (if there is one) is to be clearly indicated under Occupation, for example, G.T., P.M., B.I. or EGESS.

Any occupational injury involving lost time and/or requiring medical attention must be reported within three days of the occurrence. The employee who is hurt does not sign the WCB form 7, his supervisor does. The completed Workers' Compensation form 7 is sent to our Personnel office through your normal route of mail.

Pat Phillips
Decentralization Services
Nanaimo

Spurious emissions

Staff changes in Offshore Division include: Gary Buechler who has been promoted in the surveillance unit; Keni Lorette who was the successful candidate in competition for head, offshore management operations, and; Suzanne Benoit who has become Operations Officer in the offshore management operations unit.

Lloyd Webb has accepted a one year acting appointment as herring coordinator.

Mike Halleran has accepted the position of director, Communications Branch. He assumes his duties in December.

Paul Sprout was the successful candidate in recent competition held for senior biologist, North Coast Division. Also joining North Coast Division as a biologist is Ron Goruk, who will be working in the central coast area.

The following people have been seconded to the Pearse Response Task Force: David Reid, chairman, Al Gibson, Bud Graham, Fred Yeung and Pam McNally.

A well-kept secret; Rob Morley, international advisor, was married to Linda Hamilton on July 30.

Gary Vernon, formerly assistant deputy minister of Economic Development and Marketing, has been appointed assistant deputy minister of Pacific and Freshwater Fisheries.

Denis Rowse has joined the Department as senior habitat biologist, north coast division. Denis has a history of work in the pulp and paper industry, both in effluent control and administration.

Margaret Peters has formally changed her last name to her married name of Birch.

Leaving Queen Charlotte City is John Lamb, who is moving to Nanaimo as habitat management technician.

Joining the Department is Terry Tebb, chief, financial management division, support services branch. Terry comes from the Department of Communications in Winnipeg.

Recent births include a daughter, Joanne Elizabeth, born to Eileen and Colin MacKinnon, SEP Facilities on October 15, weighing 3.1 k (6 lb 3 oz.)

David Procter has recently joined Pacific Region's Communications Branch as media relations officer. Apart from liaising with the media, David's responsibilities include writing news releases and articles, and producing audiovisuals.

David Procter

A graduate of Ryerson Polytechnical Institute's degree program in radio and television arts, David has nine years communications experience in news and public affairs as writer, producer and interviewer. He has also done public relations and advertising for a major theatre company and has taught broadcasting and journalism at Vancouver Community College. Most recently, he produced training and corporate film packages for major organizations.

Terminal fisheries

continued from page 17

potential products, but they will require further development, both in processing and in marketing.

INSPECTION AND CONSERVATION

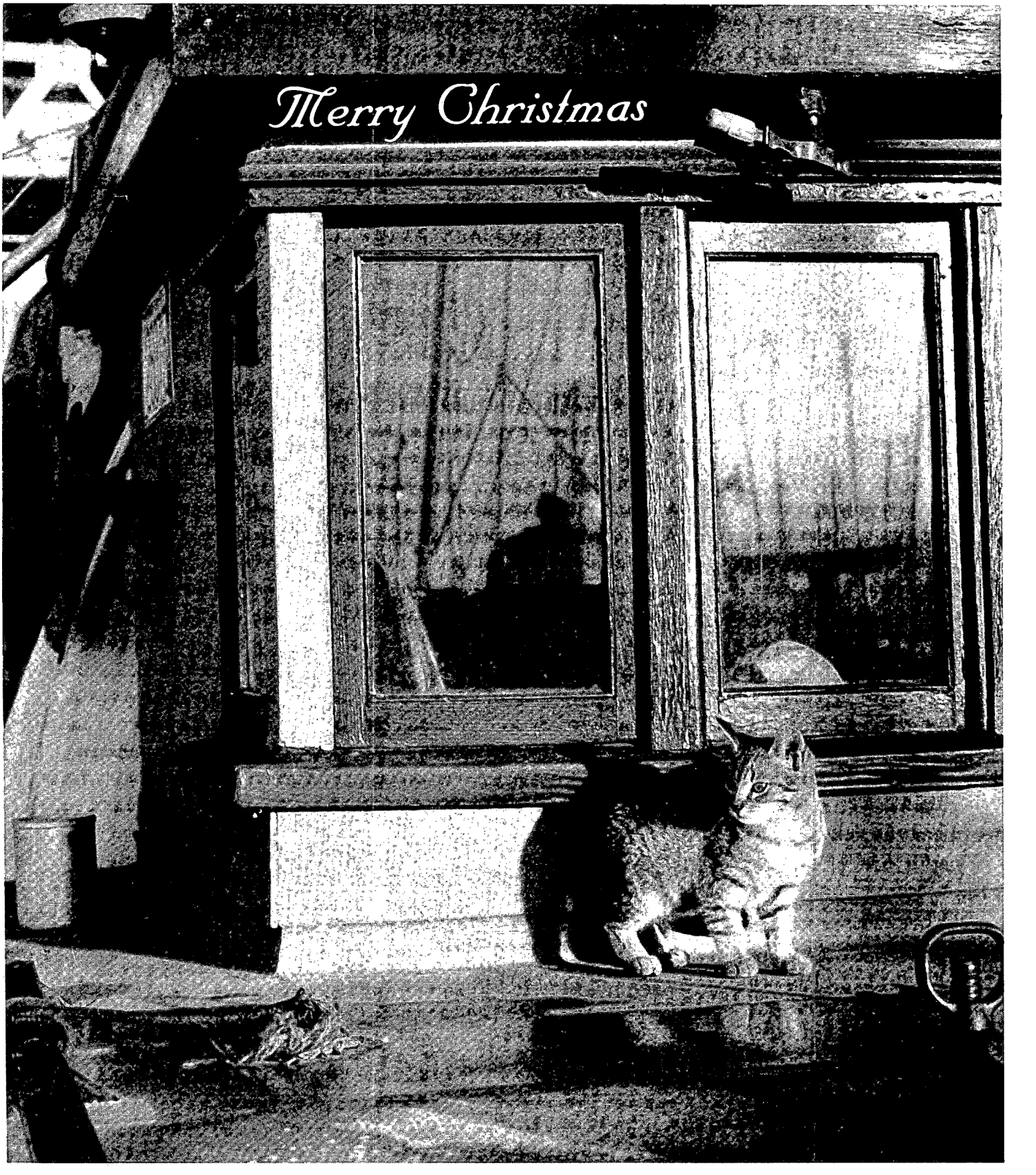
Traditionally, most salmon fisheries have been ocean fisheries, and the fleet, inspection, and enforcement have been geared to the ocean fishery. Wayne stated that terminal fisheries taking place at or near river mouths would probably not require additional inspection requirements. However, he added that if commercial river-fishing is held very far inland on a widespread basis, there will undoubtedly be special inspection and conservation requirements.

Although there are many other questions to be asked if more terminal fisheries are going to take place successfully, the results of Wayne Holmes' investigations look most promising. It is evident that the "end" fishery can signify a new beginning for some threatened wild stocks that are victims of the mixed-stock fishery. The rest is up to Fisheries management, Inspection, and the fishermen themselves.

Linda Jamieson

SOUNDER

Volume X Number Eight December 1982



Letters

A special thanks

To Fisheries staff,

Our thanks to the field staff and the staff at 1090; for their kind wishes and the handsome carving. It has a place of honor in our home.

A special thanks to Pat Phillips and all others involved for the 25-year service pin, the Fisheries and Oceans pin and the beer mug with the Fisheries badge mounted on it.

We are enjoying retirement, keeping the woodstove going, fishing a bit and reading a lot! We plan on seeing a bit of Europe and the British Isles in the spring of '83.

Bill and I, as always, have an "open-door policy" when and if any of you are over this way.

Thanks again for your thoughtfulness.

Bill and Sue Webber
Comox, B.C.

Bill and Sue Webber receive carving at retirement celebration (see page 15 for details).

Cover illustration: When fishermen are away, the cat will play. Late fall frost does not deter this kitten from going about its business.

Contents

Now hear this

Pat Phillips dropped us a note to correct an error in the last issue of the Sounder (Old friends: where are they now?). "Ed Christiansen was driving a grain truck, not a green truck," she noted.

Sounder
Newsletter of the Department of Fisheries and Oceans, Pacific Region.

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Kamloops district report

Tending the breadbasket

After seven years, I finally received my reward: a transfer to the district supervisor's position in Kamloops.

Through seven years of divisional budget meetings, I argued and fought and stole from the Kamloops district for a bigger share of the staff and dollar allotments for my district in New Westminster. After three months in Kamloops I found out how successful I was; now I face a rebuilding job and look to the dollar-rich and over-staffed(?) New Westminster district to provide resources to rebuild Kamloops district. Enough grumbling!

As most people are aware, Kamloops district encompasses some 220,000 square kilometres and is the second largest district in the Pacific Region. We have no commercial fisheries to contend with and a very small sport fishery. Our main role in this district is habitat protection. Staff in this district spend up to 80 percent of their time in this function, with the balance on Indian food fishery enforcement, poaching and salmon spawning surveys.

The Indian food fishery occurs during the period of July 15 to September 15. It is a very hectic fishery, involving one of the most serious native food fishery confrontations in the Region, at Lillooet. Over the past two years, meetings and discussions have taken place and the atmosphere appears a little less tense, with prospects of cooperative management in the future.

Poaching problems occur mainly in the Williams Lake, Quesnel and Prince George areas, where most people consider it part of a way of life to obtain their "Cariboo turkeys." Thanks to excellent work from the staff in these areas over the last two seasons, this problem is being reduced, and in some areas eliminated.

Kamloops district staff at the 1982 Field Services general meeting in Victoria. Front, from left to right: John Arnold, trainee fishery officer; Grant Scott, district supervisor; Floyd McKee, fishery officer, Prince George; Frank Voysey, fishery officer, Clearwater. Rear, from left to right: Pat Harvey, fishery officer, Cariboo, Wally Elias, assistant district supervisor; Hans Meyer, fishery officer, Lillooet; Doug Swift, fishery officer, Prince George. Missing: Byril Kurtz and Joe Chambers.

Habitat protection in this area is the major challenge. Although everyone is concerned about the environment, at times it is hard for people in the various interior industries (ranching, farming, mining and forestry) to justify the extra effort and money to protect fish and fish habitat when they feel they receive no benefits to their economic situation. Some people consider fish a nuisance. Yet, with much hard work and education, the staff of Kamloops district are working wonders in obtaining cooperation from industry and fulfilling their role of protecting fish and fish habitat.

All in all, Kamloops district is not a "soft touch" as some supervisors may suggest, but is unique in its own problems and offers a challenge to all who work here. To put it in the words of the previous supervisor here, Les Goodman, "Kamloops district is the breadbasket of the Fraser River." The fish that spawn here provide the fisheries of the future, and we in this district are responsible for protecting these spawning stocks. To date, the staff in this district, who I feel are some of the best in Pacific Region, have responded admirably to their responsibilities.

Grant Scott
District Supervisor
Kamloops

A slow turnabout on the

Less than five years ago, a one-time fisheries patrolman, Allan McEwan, wrote a widely publicized and highly controversial article condemning the Department for its inaction in preventing the decline of salmonid stocks in the Nicola River basin. On the one hand, the article gave the Department a black eye, but on the other hand, it raised vital public concern about a vanishing resource. Lillooet Fishery Officer Hans Meyer takes another look at the situation and asks, "has anything changed?"

In 1978, Allan McEwan called the Nicola basin salmon runs the "most molested groups of fish in B.C." and placed the blame squarely on the Department. Much has been done since then, but much more still needs to be done to rectify the situation.

The Nicola River basin is situated in the interior drybelt region. That means high summer temperatures and low precipitation. The Nicola's tributaries are the Coldwater River and Petit Creek. Three species of anadromous salmon (coho, pink, and chinook) plus steelhead trout and Kokanee, still frequent the river system, despite a history of setbacks and onslaughts that continue to this day. Sockeye runs in the river have been lost to history.

Studies of the Nicola River basin, ongoing since the 1950s, have been initiated to find solutions to the many problems and inconsistencies facing this drainage basin. Reports by fishery officers, from the 1930s right up to the present, have addressed concerns on the same problems and recommended corrective action by the Department.

The salmon returning to the Nicola basin have to overcome problems presented by two major pipelines, several highways (a proposed four-lane highway will follow and several times cross the Coldwater River), a railroad, town sewage and mill effluents, logging activities in the headwaters, fishing, poaching, low water periods and associated high temperatures and, last but not least, ranching, with its potential for habitat destruction.

How is ranching destructive to fish habitat? For over 100 years, ranching has been a primary industry in the Nicola Valley. Yet because of the drybelt weather, irrigation for pasture land has been a necessity. The traditional means of irrigation is a wing or diversion dam, which diverts a portion of the river down irrigation ditches and into the fields. Wing dams were constructed of gravel dredged from the river bottom, which disturbed or destroyed the redds. In some cases, the dams totally obstructed upstream migration of salmonids. After annual spring freshets, bulldozers would be back in the river rebuilding the dams.

Other major violators contributed to the steady decline of stocks. These included: the town of Merritt and its sewage dumping, which was proven to be highly toxic to fish; poaching, which was once rampant along the Nicola River; heavy construction (in 1978, the river was rendered inaccessible to salmon by repair work on a bridge just upstream of Douglas Lake); flooding and abuse of native food fishing rights.

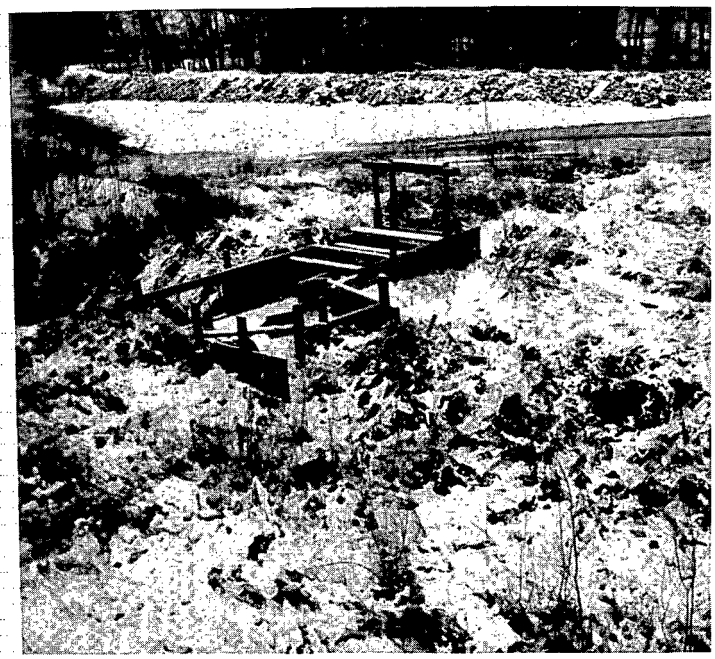
What has been done, then? During the 1970s, eight Finnegan self-cleaning designed

screens, by the Department, were installed in seven previously unscreened irrigation ditches. These screens prevented the entry and loss of fry migrating downstream. Most of the installations, through flooding, disrepair or replacement with pump irrigation, are no longer in operation.

Several government reports on the multiple resource problems in the Nicola basin have culminated in a "Nicola Basin Strategic Plan." Much of the Department's input into this plan addresses minimum flow requirements and makes recommendations for improvement on the water storage and release facilities. This plan is being drafted by the Ministry of Environment.

Some other improvements that have already taken place are: better screening in open irrigation ditches; bank protection and stabilization projects by private landowners and the provincial government; improved logging, road design and location; abandonment or modification of wing-dam design and location; and a generally better understanding of the fisheries resource requirements. This last development may be the most important of all, for without it, the enforcement confrontations, habitat destruction and fishery abuse will continue unabated.

But many of the problems mentioned here persist. The Town of Merritt is still discharging sewage into the river. The expected upgrading of the treatment plant has not taken place. A proposal for new sewage lagoons has been submitted to the Waste Management Branch and alternative solutions, such as dryland disposal,



A disused Finnegan screen, installed in the late 1970s.

are being studied. There are still several ranches using unscreened flood irrigation ditches. Poaching, although reduced, will never be completely stopped. Looking on the bright side, the salmonid resource has been very resilient and is showing signs of a slow comeback. And best of all, the people in the basin seem to appreciate it.

Hans Meyer
Fishery Officer
Lillooet

Pest control increases habitat pressure

Logging activity within the Prince George subdistrict is very widespread, with close to 20 major logging companies and countless small business enterprises engaged in the lumbering industry.

With approximately 70 salmon-bearing streams supporting, in peak years, nearly 500,000 sockeye and 6,000 to 8,000 chinook salmon, the concern for fisheries protection is deep. As a result, negotiations with both the private, public and government sectors are ongoing, making a very busy schedule for the local fishery officers.

Recently, accelerated forest harvesting to combat the devastating attacks by the mountain pine and spruce bark beetle has caused added concern. These large cuts, combined with poor soil conditions, blowdown problems and tight fiscal budgets, could have a serious impact on the fisheries resource.

With this kind of development, we cannot hope to curtail completely any adverse impact, but must work to minimize the effects. Many protective measures are employed, such as streamside leave strips, machine reserves, different logging techniques, various Forest Service protective clauses and continued education of industry. Innovation today may well ensure the perpetuity of fish stocks for tomorrow.

Floyd McKee
Fishery Officer
Prince George

Slump hasn't slowed Clearwater

The Clearwater subdistrict, located immediately north of Kamloops, comprises the North Thompson River drainage, the upper Adams River system and the upper Fraser River and tributaries. With one fishery officer, two seasonal patrolmen and a part-time clerk, we have plenty to keep us busy.

There are no commercial fisheries and only limited, seasonal sport fisheries. In fact, the 64 km of the North Thompson between Kamloops and Barriere is the only area open to sportfishing for salmon. The one Indian band in the area fishes the Fraser River at Lytton and Lillooet, for the superior quality of the fish.

This lack of fisheries leaves us free to deal with the other problems associated with spawning and rearing grounds. More than 80 percent of the fishery officer's time is spent on habitat work. With logging and milling as the main industries of the subdistrict and the river valleys being used as transportation corridors by the CNR, Transmountain oil pipeline, B.C. Hydro and Highway #5, much time is spent in planning to forestall any possible damage to salmon habitat.

With the slump in the lumber market, the amount of active logging has dropped right off, but the slump hasn't affected the forestry activity. The referrals for cutting permit applications, chart areas, road and bridge construction and the liquidation plans for the new forest licences still keep coming.

The CNR twin-tracking plans have been affecting us for the last few years and will continue to do so for some time. There are some areas of major concern that will have to be resolved before the line is completed.

Ranching and farming play a large role in the economy of the southern portion of the subdistrict. Some of the more productive salmon streams run entirely through privately owned lands. The attendant problems with low flows and irrigation of agricultural land must be dealt with by trying to find the balance point between possible losses to the salmon resource and losses to crops through lack of water.

With the increasing population of the area and the resulting urban development, more time is being spent on planning with the

Long distance operators

The Prince George subdistrict encompasses approximately 70,000 km^2 (27,000 square milkes) of the upper Fraser River watershed. Staff include two fishery officers, a part-time clerk and three patrolmen.

Due to the size of the subdistrict, each patrolman is assigned a specific area where he monitors the Indian food fishery, conducts stream clearance operations and enumerates the salmon runs.

This subdistrict contains spawning grounds for two species of salmon, sockeye and chinook. The sockeye make up four major runs: the early and late Stuart River runs, plus the Nadina and Stellako runs. Chinook salmon spawn in various streams throughout the district, with a total 1982 escapement of approximately 6,500 fish.

Habitat protection is the major role of our fishery officers, with approximately 75 percent of their time occupied by these concerns. Of these habitat matters, logging operations constitute the largest work load.

A major problem within the subdistrict's forests is the infestation of the spruce bark beetle. Thousands of hectares of timber have been and are being devastated by these beetles, prompting the timber companies to push for clearcut logging on a large scale.

Another prevailing problem is the size of the subdistrict. Even with the dispersal of the patrolmen, it is very difficult to respond to problems quickly when several hours of driving may be required to reach a destination. That is, if roads even exist.

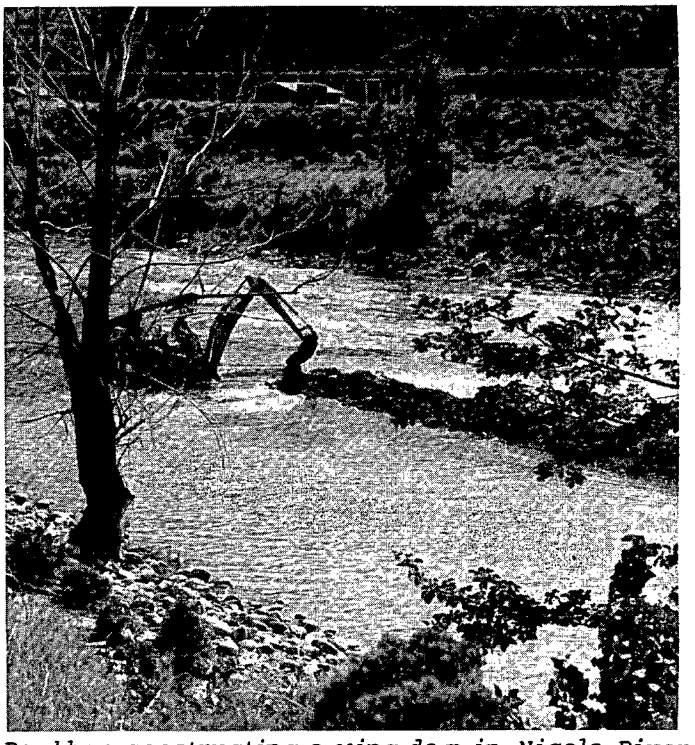
Doug Swift
Fishery Officer
Prince George

Thompson-Nicola Regional District through its Technical Planning Committee. Major DFO input is required for the populated areas of the regional district.

This work goes on year-round and keeps us quite busy. When the first of the spawners shows up in mid-July, we have to shift into overdrive, because from then until the end of November, regular stream inspections and spawner enumerations take precedence.

In summary, I will say that although we don't have the hectic and exciting saltwater fisheries, we do have the job of maintaining the spawning and rearing areas spread over long distances, and because of this responsibility, we are expected to be engineers, biologists, hydrologists and technical experts in a range of fields.

Frank Voysey
Fishery Officer
Clearwater



Backhoe constructing a wing dam in Nicola River.

Gold still big in the Cariboo

Cariboo subdistrict has an area of 70,000 km^2 (27,000 square miles) and includes the cities of Williams Lake and Quesnel, the town of 100 Mile House, and several villages. A fishery officer has been located in Williams Lake since June 1981, and an office was opened there in November of this year. A guardian works out of the former subdistrict office in Quesnel more or less year-round. One guardian is hired for Williams Lake for three months in the summer when poaching and Indian food fishing are at a peak. Budget constraints preclude the hiring of support staff.

Sockeye and/or chinook salmon spawn in the Bowron, Quesnel, West Road, Cottonwood, and Chilcotin River systems. This year, a chinook hatchery begins production at Likely, on the Quesnel River. In the last peak year, sockeye runs totalled 750,000 fish in the Quesnel and 500,000 in the Chilcotin.

Having no commercial or sport fishery, the subdistrict mainly functions to ensure the late summer and fall salmon migrations make it to the spawning grounds or up the Fraser River into the Prince George subdistrict. Its other function is habitat protection.

The Cariboo is one of the major timber production areas in the province. There are two large new pulp mills, a plywood plant and ten large, modern lumber mills in the area. Operating at capacity, the forest industry logs 283 ha (700 acres) per month. The Cariboo subdistrict also contains Barkerville, a designated placer mining area. There are approximately 400 active placer mines, over 4,000 claims staked and one placer technician. About half of the subdistrict's time is spent monitoring placer operations. Other habitat concerns include the usual urban development, right-of-way spraying, land clearing for ranching and water licences (placer and domestic), hog fuel land fills and assorted waste management branch permits.

Franz Lorenze
Patrolman
Williams Lake

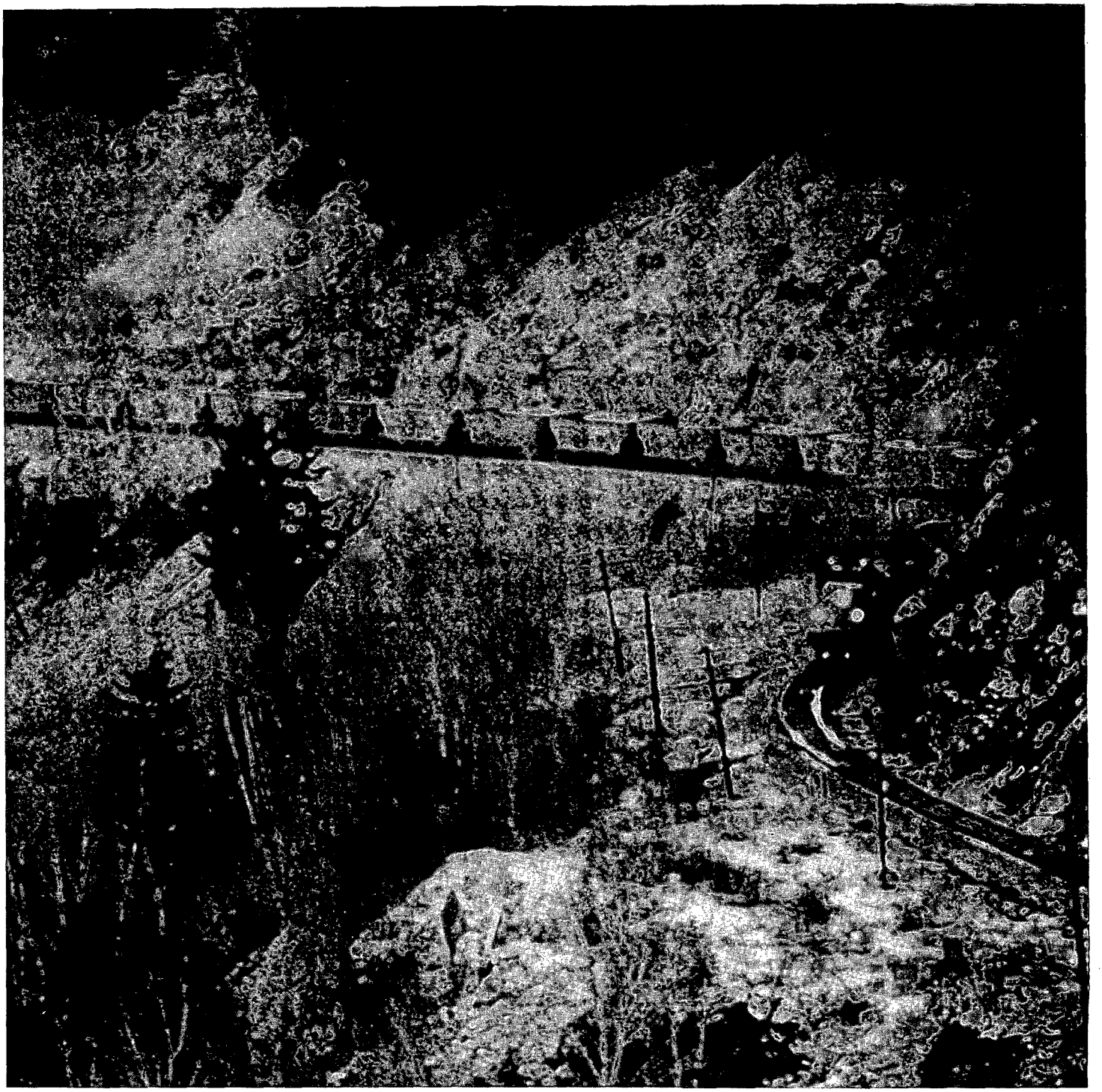
CNR twin tracking

Two tracks west

Nearly 70 years ago, the Canadian National Railway (C N R) built its first mainline through the treacherous canyons of the Fraser River. A 1912 slide triggered by the work at Hell's Gate prevented many salmon from reaching their spawning grounds and severely damaged the west coast fishing industry. In 1983, the C N R track is being twinned. This time, the Department is playing an active role in the planning.

The federal government is committed to the expansion of CN Rail capacity in Western Canada to meet rising demand in the 1980s for bulk commodities such as coal, grain and potash. This means that a second track will have to be built, paralleling the existing zone.

The twin-tracking project is, in fact, well advanced in Alberta and, over the past several years, sections of twin track have been



constructed in B.C. areas that are relatively free from potential environmental harm. However, approximately 500 km of track paralleling the Albreda, North Thompson, Thompson and Fraser Rivers still remain to be twinned. For much of this distance, land is available to enable the second track to be built without affecting the rivers. However, present planning calls for approximately 80 km of river encroachment by rock berms built to carry the new track. In addition, 40 km of tunnel will be constructed to bypass the most sensitive areas of the affected river systems; around Hell's Gate, Scuzzy Rapids and the Thompson Canyon, for example. The current plan is for approximately 50 percent of the work to be completed by 1990.

In 1980, CN provided environmental agencies with a set of maps showing their overall plan for the new line to Vancouver. Due to the obvious potential for environmental impacts, a joint Department of Fisheries and Oceans/Environment Canada task force, chaired by myself, was established (with additional representation from the Provincial Ministry of the Environment and the International Pacific Salmon Fisheries Commission) to review the project and provide CN with environmental advice. A team of consultants was contracted by CN to review existing fish and wildlife baseline data, evaluate sensitivity of specific sections of the route and carry out additional studies.

Three environmental study reports (two written reports and a map folio) have been produced to date by the consultants. The major concern from our perspective is the potential danger of obstructing or retarding upstream salmonid migration by increasing river velocities caused by encroachment of rock fills. Other concerns are the direct or indirect loss of spawning or rearing habitat and the destruction of fish or eggs during construction or maintenance operations. The center line of the new track will, in general, be 5 m from the existing center line, and thus, encroachment will be in that order of magnitude. However, effects on the river will vary according to the existing topography and specific flow conditions at individual sites.

Many questions remain to be answered, including the effects of the fills on the swimming ability of pink salmon and on migratory pathway, near the river banks, which is utilized by salmon on their upstream journey. A study program has been drafted, and it has been estimated that a further $4 million will be required for environmental studies before the project can be finalized.

The project is now at a point where public input would be useful. This will be ensured by referral of the project to the EARP (Environmental Assessment Review Process).

John Payne
Land Use Unit
Habitat Management Branch

Province establishes oyster reserves

The Marine Resources Branch of the B.C. Ministry of Environment is revitalizing a program of establishing recreational shellfish reserves in the Strait of Georgia.

Shellfish reserves are foreshore areas, designated for recreational use only, where the public can harvest recreational bag limits of oysters and clams without competition from commercial shellfish harvesters. A renewed emphasis on development and management of recreational shellfish reserves has been motivated by two main factors. First, there has been a gradual depletion of "wild" oyster stocks because of heavy commercial and recreational harvests, coupled with the fact that widespread reproduction by Pacific oysters has not occurred in the Strait since 1961. The second factor is the increasing number of recreationists poaching from commercial oyster leaseholders. Well-stocked and managed recreational reserves should help to better meet recreational demands and alleviate the problem of poaching. In addition, an increased availability and public awareness of oysters and clams in general will probably give commercial shellfish culturists and their products a higher profile in the eyes of consumers.

In the mid 1970s a recreational reserve program was instituted by the Marine Resources Branch, and UREP (Use for Recreation and Enjoyment of the Public). Reserve status was affixed to ten foreshore locations by the Ministry of Lands, Parks and Housing. These locations are Mill Bay, Patricia Bay, Boulder Point, Yellow Point, Piper's Lagoon, Nanoose Bay, Union Bay, Kye Bay, Francisco Point and Heriot Bay.

shellfish...

Mature, shuckable shellstock was transferred mainly from sewage-contaminated to clean foreshore areas for self-cleaning, then moved to the reserves. Oyster seed was also spread on some reserves. The program was given lower priority after a couple of years, but some nice, edible-size oysters can still be found as results of the seeding efforts.

Current recreational reserve planning is emphasizing the spreading of oyster seed, which will grow to maturity on the reserves, rather than the costly and time-consuming transfer of mature shellstock. In 1981-82, oyster seed was purchased from seed suppliers and held on the Marine Resources Branch seed holding reserve in Deep Bay. Seed from 1979, 1980, and 1981 will be spread on reserves during the winter of 1982-83. With a year of further growth, the earlier year class should be ready to harvest in 1983. Further quantities of seed will be purchased each year, beginning with the 1982 year class, and will provide a steady supply of oysters to the reserves. Public use of the reserves will be monitored, and reserve locations and seeding densities will be adjusted as required.

Generally, reserves are located near populated areas or near densely leased commercial foreshore and are accessible on foot or by boat. In addition to the original ten, reserves are proposed for the more populated, accessible Gulf Islands, such as Denman, Hornby, Saltspring, and Gabriola. Reserves that will be seeded with oysters are selected for a firm sand and gravel substrate and must be sheltered from prevailing weather to minimize burial or washing away of the seed. If there is an existing clam or oyster population, enhancement will be easier, although several reserves have been established on the basis of existing abundant shellfish populations alone. They will not be seeded with oysters, but the populations will be protected from commercial harvesting pressures by reserve status. Enhancement of clam populations is not envisaged at present. Clams are under federal management, and enhancement is expensive as it involves covering clam beds with a vexar mesh to reduce predation. Furthermore, clam seed is both costly and not readily available locally in large quantities.

The location of a reserve is determined after consultation with local groups, such as the Islands Trust. All reserve boundaries and accesses are marked with signs. The signs also encourage recreational harvesters to conserve the shellfish resources by observing the daily bag limits of each shellfish species and by leaving oyster seed and young clams to grow to their respective mature sizes (which are also stated on the signs). As the reserve program progresses, information on the reserves and insights into the world of shellfish and its tasty inhabitants will be made available in pamphlet form.

Commercial oyster operation at Buckley Bay.

It is not expected that recreational reserve enhancement can keep abreast of the ever-increasing activities of shellfish gatherers. However, the program will endeavor to provide areas where one or several shellfish species can be readily found and where people will be encouraged to help conserve this limited resource for their future enjoyment.

Rob Morris
Shellfish Management & Development Section
Marine Resources Branch
B.C. Ministry of Environment

Before the breaking point

That late fall run of chum didn't show up this year, fishermen are pounding on your door demanding an opening, you haven't had a decent night's sleep in two weeks and you just called your answering service to learn that your wife is leaving you.

If these kinds of problems ever darken your day, then you'll know the meaning of the word "stress." Obviously, most of the Field Services staff who attended the recent general meeting in Victoria are familiar with the word and the condition. The three-hour common session presented by Dr. Joe Neidhardt was the most popular session of the three-day gathering (with the possible exception of the no-host bar).

Dr. Neidhardt is director of the Western Center for Preventive and Behavioural Medicine, a Vancouver-based medical research group. Dr. Neidhardt's specialty, preventive medicine, may become the medical byword of our time. It is safely said that the greatest portion of ill health in western society could be prevented, and the high costs of medical care avoided, with preventive care. Neidhardt, though, wisely skipped the "if onlys" and stressed the practical; the heart of the situation.

"One of the easiest ways to learn how to relax is to learn how to breathe properly," he said, presenting a slide of an infant with her tummy protruding.

"People who get heart attacks breathe differently than people who breathe correctly."

The key to proper breathing, Neidhardt pointed out, is to use the full volume of the lungs. Rather than breathe with the chest only, allow the stomach to move out first, so the diaphragm can expand.

"You'll have quite a few physiological changes in your body if you do that," he said.

Immediately before beginning his talk, Dr. Neidhardt issued a tiny, round paper sticker to each of the session participants. The stickers, called biodots, contain temperature-sensitive cholesterol liquid capsules, and serve as indicators of stress level. Within seconds of applying a biodot, the wearer carries a badge of his or her stress level, be it very relaxed, calm, relaxing, involved, unsettled, tense or very tense. For example, a red dot indicates a very relaxed person, a black dot indicates a very tense person.

A biodot belonging to a volunteer from the audience had turned black only seconds after the volunteer had joined Dr. Neidhardt.

"Laughter is one of the best ways of relieving stress and coping," Neidhardt continued.

"Starting an argument can be effective, particularly if you tend to repress anger."

"I see somebody chuckling back there. Is that the same lady who had the red dot?"

"Often though, if there is a structured way of letting out frustrations, it is easier to do so," he added.

He went on to explain the symptoms of stress and some of the basic means of overcoming it.

There are three ways in which people react to stress: behavioural reactions, including such common acts as smoking or drinking; pyschological reactions, including depression and frustration, and; physiological reactions that include hypertension and physical fatigue. The solutions to these problems are surprisingly simple, especially when weighed against the long-term hazards of stress; high-blood pressure, heart disease, alcoholism and intestinal diseases, to name a few. Dr. Neidhardt emphasized the simplicity of the preventive solutions.

"Self-help books do not work well, especially if they're simple, because we tend to disbelieve that it's the simple things in life that can help us."

He recommends that people who suffer from stress first take stock of their environment to locate and isolate the trouble spots in their lives.

"What can you do to change your environment? How can you make your life less stressful?"

"Eat more appropriately, communicate more effectively and exercise more."

Mike Youds
Editor

Leavenings

Kid's poster contest

"Salmonid" is sponsoring a poster contest for children up to the age of 17. There are three subjects for budding artists to try their hands at: save our wild salmonids; protect our small streams; help rebuild B.C. salmonid stocks. The contest closes March 31 and winners will be announced in the June issue of "Salmonid." There will be 9 first prizes of $50 and 9 second prizes of $25. More details will be announced in the January "Salmonid."

The editor (Maxine Glover, at 687-1442) is trying to ensure that the contest receives good notice throughout the school system; however, your help in publicizing it in your community is appreciated.

Primary package field testing

The primary (kindergarten to grade three) version of SEP's much-lauded educators package "Salmonids in the Classroom" is now being field tested by 16 teachers throughout the province. Contact James Boland, 666-8253 for more information.

PIP evaluated

DPA Consultants and Dennis Rank, management consultant, have been awarded a contract to evaluate SEP's Public Involvement Program (PIP). Social, technical and economic evaluations will be carried out on the four components of PIP:

- public participation (the community advisors/volunteers aspect)
- Salmonid Enhancement Task Group
- information ("Salmonid," displays, etc.)
- education ("Salmonids in the Classroom," etc.)

An interim report is expected in late January 1983; the final report will be ready by March 31, 1983.

The evaluation will help to determine whether these activities should continue in Phase II of SEP, and if so, on what scale.

For more information, please contact James Boland, head, Public Involvement Program, 666-8253.

Audio/visual room

The Communications Branch has obtained a room on the second floor of 1090 West Pender Street to contain our video tape recorder, a 16 mm film projector, the catalogue of slide transparencies, some black and white prints and light table. At present, we retain our storage on the 10th floor for all other a/v equipment and material.

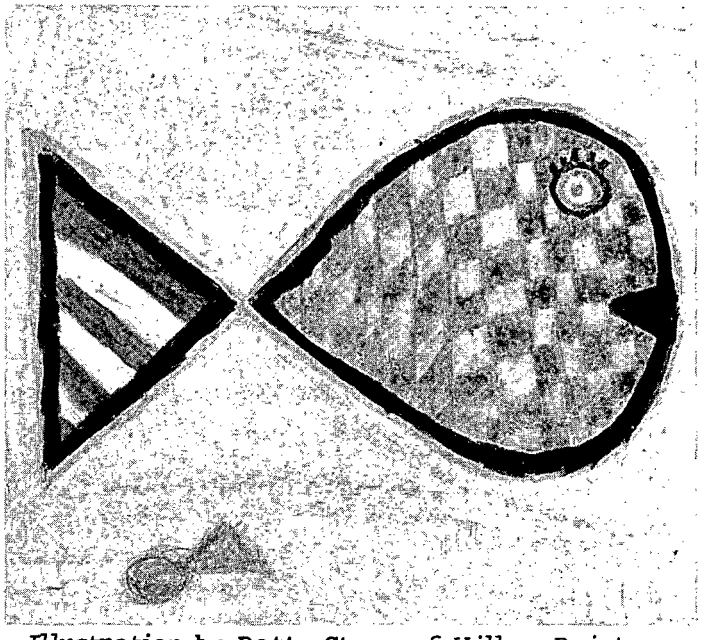


Illustration by Patty Stone of Willow Point Elementary School, Campbell River.

So that we can provide the best service possible, we have set up the following schedule for use of the a/v room and for borrowing a/v material.

To book the a/v room, please phone Marjorie Peace (666-1384) at least one day ahead. You can obtain the key from Marjorie (Communications Branch, 9th floor) at the time you have reserved the room. Please lock the room and return the key to her after use.

To borrow a/v equipment, films, slide shows and video tapes, please also phone Marjorie with at least one day's notice. Material requested in advance may be picked up from the Communications Branch between 8:30 am and 11:30 am every day. (The exception to this is that material for use in the a/v room can be picked up at the same time as the key.) Please return all borrowed material to Marjorie on the 9th floor.

To book the a/v room for use of the slide catalogue and print collection, please phone Diane Paxton (666-1385) at least one day ahead. The room is reserved from 3:00 pm to 4:30 pm for this purpose. If help is required to search for or select slides, please make an appointment with Diane at the same time.

Although a minimum of one day's notice is essential, a week's notice is recommended to ensure the room time you require or the material requested is not already booked out. Unfortunately, Communications Branch staff are unable to respond to same-day requests.

What you can expect

by Pat Phillips

Many of you are unhappy about the recent rule changes regarding the designated signing authorities.

Let me assure you, even though delegated signing authorities have only now been reduced, the regulations have always been there, under the Financial Administration Act. They have been badly abused hence we now have tighter restrictions.

This October, the Minister and Deputy Minister of Fisheries and Oceans signed, under the Financial Administration Act (FAA), the delegated signing authorities chart for our Department. The chart specifies which organizational positions, and not individuals, would have signing authority within their designated areas of responsibility, subject to the limits that were indicated.

New signing authority cards were distributed on which are specified the level of spending authority delegated (director, chief, section head or supervisors, for examples). The cards also specify the areas of authority and the respective collator numbers.

Under the spending authority there are three subdivisions:

Commitment:
delegated to Finance staff under Section 25 of the FAA, this confirms that there is a sufficient unencumbered balance available to commit an amount to be paid for an item requisitioned in the proper manner.

Expenditure:
delegation has been made to the responsible budget manager who authorizes expenditures to be charged to his/her budget.

Contract Performance:
delegation has been made to the responsible budget manager to sign under Section 27 of the FAA. This certifies that the work has been performed as required, services and supplies have been satisfactorily provided, travel has been successfully carried out, employee overtime has been worked and contract performance has been in accordance with contract arrangements and conditions.

One important section is the one titled A Separation of Spending and Payment Authorities. Spending and payment authority, on any particular item, must not be exercised by the same officer. The person buying cannot certify the invoice for payment. This has always been the rule, but the consensus of opinion seems to have been that "rules are made to be broken."

Delegation of Signing Authority cannot be further delegated by a person in a position. There is no right conferred to further delegate, but in a temporary or "acting" situation, the "acting" alternate to the signing authority may be designated as such on a continuing basis. In this case, a signature card should be prepared for the appointee. This card should indicate the alternate's name, position, signature and the approval of the superior officer.

More than one alternate can be designated to an incumbent, to provide for situations where both the incumbent and the designated alternate are absent at the same time, or where the incumbent wishes to restrict specific authorities to different designated persons.

Another important point to remember is that the regional financial officer must be notified immediately of the termination of any signing authority.

The delegated signing authorities are reviewed annually, to ensure that all cards are current, that the types and levels of delegated authority comply with the delegated authority and that the delegations are adequate and consistent. All in all, it is a fairly consistent paper exercise, which supposedly keeps the budget managers on a straight dollar and within the confines of their budget.

Merry Christmas and a Happy New Year. Here's to the correct completion of all paperwork in 1983.

Pat Phillips
Decentralization Services
Nanaimo

Spurious emissions

Dale Patterson commenced duties November 15 as acting district inspection supervisor, Vancouver; he previously worked in Prince Rupert and Victoria.

Wendy Grider has been appointed licencing manager on an acting basis while Dick Carson acts as chief, Management Services Division.

Kent Harper has been appointed as assistant supervisor, New Westminster. There are now two assistant supervisors in that district, with Larry Ottman occupying the other position.

Bill Southgate, engineering technician, SEP Special Projects Division, is retiring from the Department. He will be missed by all his co-workers and is wished many happy years of retirement.

Brenda Nicoll, Offshore Division, is leaving the Department on December 10.

Howard Smith has returned to the Pacific Region from his assignment in Ottawa.

Rita Morris has joined Communications Branch as administrative officer.

Fishery officer changes include: Gordon Curry who has been promoted and transferred to Bella Bella from Kitimat; Barry Rosenberger has won a fishery officer competition for waterfront officer in Prince Rupert.

Beverley Pilfold commenced duties on November 29 as budget and administrative officer, Northern Operations Branch in Prince Rupert.

Winners in recent competitions held for assistant hatchery managers are: Dave Celli, Tenderfoot hatchery; Richard Stitt, Chehalis hatchery; Stu Barnetson, Quesnel hatchery; and Chris Beggs, Puntledge River hatchery.

Rita Morris

Jock Embleton, Pat Phillips and John Cairns were honored at a recent reception that recognized 25 years of government service from each of them.

A number of staff changes have taken place in the Economics and Statistics Branch.

Brian Moore has been appointed to replace Joanne Moloney as chief of Statistics. Joanne has moved to Ottawa.

Russell Mylchreest has been appointed to the position of groundfish and shellfish analyst. He takes over from Mary MacGregor, who has gone to UBC Economics Department. Since 1979, Russell has been an economist for the Economics and Fiscal Policy Branch of the provincial Ministry of Finance.

Michelle James has been appointed sportfish economist. Michelle was formerly consulting on contract to B.C. Hydro and Alcan Aluminum.

Paul Kopas is replacing Mary Hobbs as habitat policy analyst. Mary will be taking a year-long leave of absence in Australia. Paul was formerly an economist for Resourcecon Ltd.

Changes in Fisheries Research organization include Dr. Glen Jamieson, who will be section head of Shellfish and Herring. The former shellfish section will become a program headed by Dr. Jamieson, and Herring will become a program headed by Dr. Max Stocker. Marlaine Brown will be the secretary for this new section.

Bev Bowler and Cindy Low have won the "1982 Award of Excellence," Special Print category, for their brochure "Stream Care." The award was given by the International Association of Business Communicators, B.C. chapter.

Chilliwack Hatchery Manager Don Buxton has been named "Honorary Dogfather" by the Totem Fly Fishers. At a recent meeting, one club member praised the wonderful work of the hatchery in producing large numbers of chum salmon. The Chilliwack River, however, was once a pristine coho stream, he said. The member then made a motion, subsequently carried, that Buxton, a member and past president of the club, be elevated to dogfather status. Don now has the privilege of being known as "the Don."

Oregon fisheries officials report severe damage to smelt spawning stocks in the Lincoln city area following the sighting of two SEP Operations staff (also known as Birkenboast and the Terrorist) cavorting in the Oregon surf in the wee hours of November 2. The occasion was the Northwest Fish Culture Conference.

A retirement dinner for Bill Webber, former fishery officer, was held at the Sand Pebble Inn at Qualicum Beach on Saturday, November 13 Norm Lemmen and his wife Barb, Jack Trent and his wife Beth, Ray Kraft and his wife Joey, Captain Bob Walker and his wife Rhoda, Pat Phillips and Cliff Mason joined Bill and Sue to present Bill with a card and gifts. Norm Lemmen presented an Indian-carved salmon and made interesting comments on Bill's career with the Fisheries. One interesting fact was that Bill and Captain Bob Walker (ex-Fisheries patrol captain of the "Atlin Post") sat for their skippers' examination together. Jack Trent presented Bill with the proverbial Silver Mug, Ray Kraft made presentation of the service time award and Pat Phillips gave him his 25-year pin. Eveyone joined in wishing Sue and Bill the best in whatever they do on their retirement.

David Procter

A case of blackmail or just another day with the Fishing Vessel Insurance Plan? Fortunately, for Jock Embleton and us. it is neither. Jock is celebrating his anniversary with a gift from his wife.

Name dropping

The average employee of the Department, having worked nine years with Fisheries and Oceans, will know that this agency is fond of name changes. The name of the Department has been changed three times in the last ten years. But even the oldtimers will be surprised to know that the Department, since it was formed on Confederation in 1867, has had ten name changes. Here they are in chronological order:

1867-1884:	Department of Marine and Fisheries
1884-1892:	Department of Fisheries
1892-1914:	Department of Marine and Fisheries
1914-1920:	Fisheries Branch, Department of Naval Services
1920-1930:	Fisheries Branch, Department of Marine and Fisheries
1930-1969:	Department of Fisheries
1969-1971:	Department of Fisheries and Forestry
1971-1976:	Fisheries and Marine Service, Department of Environment
1976-1979:	Department of Fisheries and the Environment
1979-?:	Department of Fisheries and Oceans

The changes, of course, reflect bureaucratic reshuffling and not whimsical preferences Environment Canada letterhead is still floating around, waiting to be used up. If anyone in the office claims to have worked for the navy, retire them immediately; they must have started with the Department before 1920.

What did you say your name was?

The 1983 Sounder Photo Contest

Problem: We need good photographs to illustrate Fisheries publications.
But we cannot afford to hire photographers.
And we cannot afford to buy stock photos from an agency.

Solution? LET'S HAVE ANOTHER SOUNDER PHOTO CONTEST!

Brilliant idea.

Introducing, the late, great, third "annual" Sounder Photo Contest.

With prizes!
And glory!
And glorious prizes!

Contest rules

1) Contest opens January 1, 1983, and runs to July 1, 1983.

2) Open to all Fisheries staff.

3) Categories are all related to Fisheries activities.

They are as follows:

a) Commercial fishing (any fishery)
b) Sport fishing
c) Native food fishing
d) Fish processing
e) Fisheries staff at work
f) Fish or marine life in their habitat

4) Enter slides or prints (with negatives attached) of any size. They may be black and white or color prints.

5) Do not write any description on the photo. Enclose a separate note with the name of the photographer and the description.

6) Enter as often as you like.

Prizes

Prizes of $100 each for the top photo in each category.

- Judges' decisions are final. Prizes will not be awarded unless photo quality merits it.
- All entries become the property of the Department.
- Don't be discouraged from entering. Anyone can take a winning photograph!
- Send all entries to: Sounder c/o Maxine Glover, 6th floor, 1090 W. Pender St., Vancouver, B.C. V6E 2P1.
- Photographers will be credited if their work is used in any publication.