THE SOUNDER

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# PACIFIC REGION: THE FISHERY OF THE FUTURE

Fisheries management is always complex and frequently controversial, but never more so than in recent years.


In Pacific Region, it is clear that the existing management program must be changed to effectively cope with the complexities imposed by a large and increasingly efficient commercial fleet, the changed nature of aboriginal fisheries and the expectations of the sport fishery. The time is now at hand to implement a new management program that can meet the public test of confidence and achieve the objective of an environmentally, economically viable and sustainable fisheries sector.

Conservation is key, and is the cornerstone of the radical program of change now taking place within DFO.

Minister Brian Tobin recently announced a five-point action plan for the 1995 Pacific salmon fishery. The plan responds to recommendations by the Fraser River Sockeye Public Review Board following its investigation into the shortfalls of salmon returning to the Fraser River's spawning areas in 1994. (By now, you have received a copy of the Minister's statement and DFO's response to the review board).

The Minister emphasized the importance of accepting all of the board's findings and taking full responsibility to ensure that mistakes of the past are not repeated and that order is restored to the Pacific salmon fishery. While making a commitment to implement all of the board's recommendations, the Minister stressed that the department must go further and address some of the structural problems faced by the Pacific fishery.

Since becoming Minister of Fisheries and Oceans, Tobin has recognized the problems inherent in fisheries management on both coasts and has taken a number of steps to change the status quo.

Positive developments are a capable new generation of senior managers. DFO has a new Deputy Minister—Bill Rowat—and Assistant Deputy Ministers Martha Hynna, Robin Glass, Pat Chamut and Scott Parsons. Three new Regional Directors General have been appointed in Central and Arctic (Burton Ayles) Quebec (Bernard LeBlanc) and Pacific Region (Louis Tousignant), as well as a new Director General of Communications (Ninon Bourque).

The new RDG in Pacific Region has a well-established track record of getting things done well. Paul Sprout, recently appointed as Director of Operations Branch and a new Director of Conservation and Protection—Superintendent Stuart Cameron, a veteran RCMP officer—are valuable additions to the management team. This process of change and renewal is only the beginning.

Another major factor that will fundamentally change the way the department does business is the comprehensive Program Review the department is now undergoing. A key element in the review process is the merging of DFO with the Coast Guard—a move that will significantly enhance our oceans and enforcement presence.

Pacific Region RDG Louis Tousignant, tasked with overseeing a new, revitalized management regime, sees a number of challenges that are already being addressed.

Tobin's statement of March 7 concluded by saying: "Based on the board's findings through its consultative process since last October and views expressed by stakeholders and British Columbians, there is a consensus that a vision for the future must be based on :

- real conservation and a sustainable fishery;
- a self-reliant, viable fishing industry; and,
- the development of new partnerships."

"The action plan outlined by the Minister will move us resolutely towards achievement of these important objectives," says Tousignant.

"I believe we are now well on our way. For now and over the long term, partnerships and a shared vision for the Pacific fishery are paramount. Our common goals must be to create a smaller, more economically viable and ecologically sustainable fishery of the future, based on partnerships and reciprocal accountability with respect to management and enforcement.

"DFO must build and foster a 'conservation ethic' among all user groups and governments. This shift in attitudes is vital in promoting the long-term sustainability and health of the resource. We are moving in this direction. Our future fishery in Pacific Region will involve a significantly increased responsibility for industry to self-regulate and self-enforce.

"As the Minister has pointed out, we cannot repeat the mistakes of the past. 'Conservation' will not be a slogan, but rather an absolute imperative that guides every decision."

To that end, Tousignant emphasizes the need, as we reorganize the way the department does business, to protect and reinforce the components of the organization that are directly involved in core mandate activities.

"We have a new, dynamic management team that is committed to the conservation and protection of our fisheries resource, and very clear direction from the Minister. I have every confidence that Pacific Region staff can more than meet the many challenges that lie ahead."

**DFO's Action Plan for the Pacific Fishery**

The response to the Fraser River Sockeye Public Review Board has shown that the public and stakeholders share DFO's renewed commitment to sustainable fisheries, with conservation being the driving principle of all our actions.

DFO's plan includes:

- a more conservative approach to management;
- increased enforcement and compliance;
- better integration of science and management priorities;
- a tough stance on the conditions of agreements under the Aboriginal Fisheries Strategy, particularly with respect to 1995 pilot sales; and,
- necessary measures to build a fishery of the future based recommendations from industry on fleet capacity.

## CONSERVATION

**Fisheries management**

Starting in 1995, to provide greater assurance that conservation priorities are achieved in all Pacific fisheries, DFO will implement an aggressive conservation strategy. Fishery managers will:

- develop pre-season management plans based on conservative pre-season stock forecasts;
- increase spawning escapement targets in-season based on extreme environmental factors such as high water temperatures and adverse flow conditions;

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Your contributions are welcome. Please send story ideas, photos and letters to the editor.

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- reduce harvest rates, up to and including closure of the fishery, when run size is uncertain; and,
- implement diligently the Strait of Georgia coho rebuilding program.

In the near future, following consultations with stakeholders, strict measures to conserve and protect West Coast of Vancouver Island chinook will be announced.

In addition, DFO will work with industry to devise measures to reduce the fishing effort in Johnstone Strait in 1995.

## ENFORCEMENT AND COMPLIANCE

### Enforcement

The department is developing a strategic enforcement plan as part of an overall, integrated salmon management plan. This plan will address not only the problems identified by the Fraser Board, but also issues that affect all fisheries on a coast-wide basis.

Elements of the enforcement plan will include:

- increasing enforcement resources — 15 new fishery officers above the 1994 complement;
- strategically deploying resources and targeting key problem areas such as Johnstone Strait and the mid-Fraser River;
- developing blitz-style enforcement strategies, including flying squads as well as quickly dispatched and highly mobile patrol vessels;
- targeting serious offences and chronic offenders;
- accelerating the training of marine crews as fishery officers in support of enforcement activities;
- increasing enforcement capabilities of charter patrol fleets;
- application of licence sanctions — that is, suspensions of fishing privileges — against those who violate fisheries laws;
- cooperative work with other agencies (eg. the Canadian Wildlife Service, the Canadian Coast Guard, the RCMP and the Province) to ensure increased compliance; and,
- implementation of a more integrated enforcement approach and accountability regime between DFO and Aboriginal fishery officers.

## COMPLIANCE

DFO will enhance compliance and build on the board's recommendations by:

- requiring mandatory hails for all fisheries;
- implementing new measures to prevent the laundering of fish in the commercial fishery;
- ensuring strategic enforcement of sales slip requirements;
- implementing a formal landing slip system for all fisheries on a phased basis; and,
- closing fisheries when necessary to ensure that user groups provide the department with necessary catch data.

In a broader context, DFO will implement community policing initiatives, encourage public participation in a 24-hour crime tips hotline and establish a coast watch program.

## INTEGRATION OF SCIENCE AND MANAGEMENT PRORITIES

DFO's newly created Stock Assessment Division will:

- provide reliable and timely advice on the status of fish stocks and issues of biodiversity; as well as ensure that top priority issues get full attention;
- focus on reliable pre-season and in-season stock assessment advice; and
- facilitate ongoing communications among scientists, managers and the Pacific Salmon Commission.

This body will address the main technical concerns raised in the Fraser report, including further in-season activities with hydroacoustic assessments at Mission (in collaboration with PSC staff) and Qualark Creek, on the Fraser River.

DFO will also enlist fishers willing to cooperate with the department to provide reliable and timely catch information to supplement catch statistics.

## ABORIGINAL FISHING STRATEGY

The pilot sales program will continue, without any further expansion, and DFO will continue the program to retire voluntarily existing commercial licences for which $5.7 million is allocated in 1995.

Improvements in existing pilot sales are absolutely necessary. In 1995, there will be no sales agreements unless the following conditions are met:

- the agreements are signed by May 15, well before the sockeye season begins; and
- a closer reporting relationship between Native guardians and DFO enforcement authorities is guaranteed.

In many areas, the aboriginal agreements have had a remarkable degree of success and provide the tools to improve resource management. However, in the case of the Sto:Lo sales agreement, an audit report commissioned by the Minister indicated serious financial accountability problems in the administration of their agreement.

The Minister has served notice that unless there are dramatic changes from the situation that prevailed in 1994, the sales agreement with the Sto:Lo will not be renewed. A sale agreement will only be authorized with the Sto:Lo if, in addition to the above requirements, all of the measures prescribed in the audit report are met, in particular, the independent/third-party administration of their financial affairs with total assurance of rigorous financial accountability.

Pacific Region managers are meeting with the Sto:Lo shortly, as well as with other aboriginal groups involved in pilot sales agreements, to make clear the conditions that must be met in 1995.

## INDUSTRY RENEWAL

A fundamental cause of the increased difficulty in managing the salmon fishery is that the size of the fleet has remained static while its fishing power has increased dramatically. The board's report observes that the system is stretched and that in 1994—to all intents and purposes—the department was managing at the edge. Rather than enhancing our ability to manage closer to the edge—by increasing exponentially the staff and resources of the department—we must instead pull back from the edge. DFO must not approach the fundamental issue of dealing with fishing capacity by simply pouring in even more resources to manage an increasingly powerful fleet.

Absolute priority will be given to devise and implement a solution to this problem in cooperation with industry.

The Minister has recently asked his senior advisory body, the Pacific Regional Council, to hold a workshop in April leading to the establishment of an industry Round Table in September.

The Round Table will be expected to make specific recommendations by the end of this year on commercial fisheries management reforms, harvesting strategies and institutional changes that are urgently needed in the commercial fishery to ensure conservation and sustainable resource use.

The issue of fleet capacity has been discussed repeatedly over the years, with no success. Failure to reach consensus must not again be an excuse for inaction. In the absence of an industry consensus, DFO will be fully prepared to make the final decisions arbitrarily and to implement unilateral changes in the 1996 fishery.

As part of this process, the Minister intends to undertake consultations on the creation of a Pacific Fisheries Resources Conservation Council, as suggested by the board and the Province of British Columbia. As well, a process will need to be devised to deal with inter-sectoral allocation issues, once the action plan is implemented.

## THE ENVIRONMENT

A key chapter of the Fraser River Sockeye Public Review Board deals with the environment. One of the single most important recommendations in the report asks the Department of Fisheries and Oceans to urge the Greater Vancouver Regional District (GVRD) and the Province of British Columbia to install, without further delay, the secondary sewage treatment facility at Annacis Island. There is also the need to improve the Lulu Island treatment facility. Clearly, the Fraser River system is the heart and soul of the Province of British Columbia and the sorry state of the estuary—where juvenile fish rear and adult salmon migrate—cannot be left neglected and unattended.

Sheila Copps, the Deputy Prime Minister and Minister of the Environment, has joined DFO's Minister in asking the Province of British Columbia and the GVRD to take immediate and decisive action in upgrading sewage treatment at Annacis Island and Lulu Island. These facilities are currently responsible for 41 per cent of the waste water discharge volume in the entire Fraser Basin, and both the province and the GVRD must shoulder their part in saving our salmon resource.

The Fraser report states that "this report is not about people and institutions; it is about the sockeye salmon, and the need for all stakeholders to work together to conserve and protect those salmon for future generations."

# THE CHANGING FACE OF DFO

*DFO's Strategic Action Plan resulting from the Program Review process is now being implemented across the department. The Plan—to be phased in over a five-year period—builds on a vision for fisheries and oceans management in the future, and focuses DFO's role on conservation of fish stocks and their sustainable utilization. In addition to the increased emphasis on conservation, the department will take on an expanded role in the coordination and delivery of Canada's oceans policies and programs. Included in this new approach is a merger of the Canadians Coast Guard with the department. By working as one, Canada's ocean management will be greatly strengthened. The major objective of the merger is "getting government right."*

*By now all staff have had an opportunity to review the details of DFO's new direction as outlined in the fact sheets distributed the week of February 27. A number of initiatives are now under way in Pacific Region as part of Program Review implementation. In this issue of The Sounder we take a look at the changing face of DFO, and how the regional initiatives fit into the overall structure of the national Program Review.*

# REGIONAL TRANSITION TEAM UP AND RUNNING

Implementing the new directions needed to streamline and realign the Department is a challenge that requires a focused management of the organizational and cultural changes brought about by the Program Review.

Managing the human side of change is the mandate of the National Transition Management Committee, which was established toward the end of 1994. The committee is also intended to provide a vehicle for employees to actively participate in the transition process.

As one of seven regional teams supporting the national committee, the Pacific Regional Transition Team was launched in February, and is chaired by Susan Steele. Team members were selected to represent the various areas of the region and are drawn from a wide variety of backgrounds.

The purpose, says Steele, is to "provide all staff reasonable access to team members. The members represent the region as whole, not just their branch, occupational group or specific location."

To date, the RTT has met several times and is actively working to establish itself as a forum for staff concerns, and to serve as a communications conduit between staff and senior management on implementation of Program Review initiatives.

In the wake of the federal budget announcement, the RTT was able to convey employee questions and concerns to managers on a timely basis. Some of the concerns noted by staff and relayed via the RTT, for example, focused on the need to announce detailed information on 1995/96 reductions as quickly as possible, particularly within Science Branch. Employees also underlined the need to provide staff with plans on specific activities such as program reductions and cuts for the next several years of Program review.

Specific concerns on details of the incentive package announced by the Treasury Board Secretariat were also raised by a number of staff.

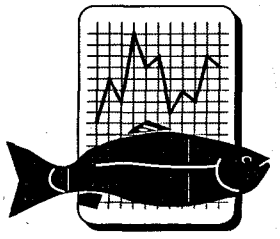
With assistance from Human Resources, the RTT will be provided regular bulletins to address these and other employee concerns. Watch for them!

# BRANCH REVIEWS

At the national level, 12 implementation teams have been established in the following areas: Revenue Generation, Fisheries Management, Science, Fresh Water/Oceans, Rationalization, Vessel Management, Inspection, Communications, Structure and Policy.

In Pacific Region, a number of branches have assembled teams to examine issues and reshape their organizations in keeping with the new directions developed by DFO. In this issue we will look at some of the changes taking place in Science (including Habitat), Operations, SEP and Inspection. Further details on remaining Branch efforts will be outlined in the next issue of the staff newsletter.

## SCIENCE



Through the Program Review, the Science sector has identified three key program areas: conservation of marine and anadromous fishery resources; protection of marine and fish habitat; and safe navigation. In October 1994, as part of the departmental reorganization, the responsibility for fish habitat management was transferred to the Science sector to broaden its mandate to include an operational resource management role and a regulatory function.

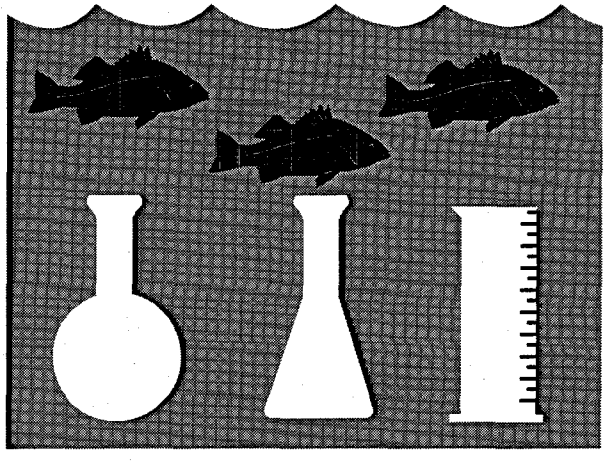
Science Director John Davis says regionally, the sector is actively pursuing a number of new directions. A top priority is integrating science and fish priorities through the newly created Stock Assessment Division, which merges some 70 science and 40 operational personnel. The new division will provide reliable and timely advice on the status of fish stocks and issues of biodiversity, focus on reliable pre-season stock assessment advice and facilitate ongoing communications among scientists, managers and the Pacific Salmon commission.

"We are also revising PSARC to include stakeholders, in keeping with Program Review's direction of moving toward shared management of the fisheries and cooperative arrangements with our clients. In future work, we will also collaborate further with universities and the fishing, aquaculture and oceans industries," says Davis.

Changing scientific priorities will also mean an emphasis on coordinating work activities to eliminate artificial boundaries between scientists addressing common problems. With shrinking budgets, scientific teams with complementary expertise will be brought together from various regions and disciplines.

"We might want to share across the department projects such as hydroacoustic methods for counting fish that we have developed in the region, as one example," says Davis.

For 1995/96, the Science sector has some deadlines to meet. These are full implementation of the recommendations from the Fraser River Sockeye Public Review Board, development of new funding sources and partnership arrangements and follow-up on the B.C. Utilities Commission recommendations on Kemano.



# HABITAT & SEP

Pacific Region is pursuing the concept of merging Habitat and SEP into one organingzation. This would elevate the focus of both habitat management and fish production. A combined branch would also maximize the expertise present in the two branches. The amalgamation has been discussed by the Regional Executive Committee and further consultations with RHQ and regional field staff are planned. Follow-up discussions are also planned with senior management and RHQ staff.

**Habitat**

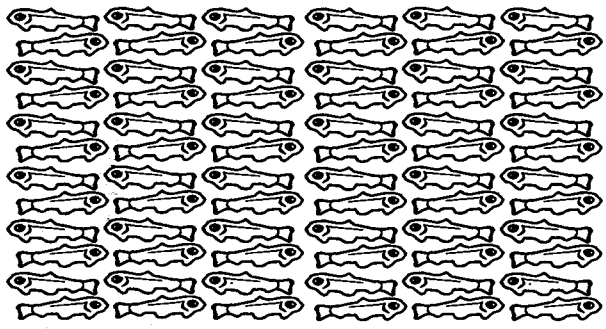
Habitat Management has responded to the Program Review by preparing a comprehensive overview document entitled Habitat Management Vision for Change. The document endeavours to look ahead at the new environment in which the Habitat Management program can expect to be operating in the future, and describes a vision for Pacific Region that best equips it to meet its conservation responsibilities.

The document was developed through the combined efforts of many Habitat staff members from throughout the region. Once approved and its feasibility confirmed, it is anticipated this document will provide a basis for preparing detailed workplans to assist in achieving the outlined vision.

Using as its goals those set by DFO's Policy for the Management of Fish Habitat, as well as the no net loss of


productive capacity guiding principle, the document outlines a number of strategies to achieve its objectives. These goals are:

- Protecting fish habitats by administering the Fisheries Act and incorporating fish habitat protection requirements into land and water use activities and projects.
- Shifting the emphasis away from site-specific project reviews (referrals) towards participation in cooperative planning initiatives.
- Encouraging wider use of guidelines for incorporation into other agencies and authorities legislation and increased monitoring and evaluation of the effectiveness of guidelines.



- Integrating habitat, science, stock assessment, salmon enhancement, fish production and fish management functions within Pacific Region.
- Ensuring a watershed approach is taken in habitat restoration and development activities, with a greater emphasis on long-term planning.
- Increasing the efficacy of habitat enforcement
- Developing and maintaining credible capabilities in key areas such as Science.
- Complementing the shift from reactive to proactive management by placing a greater emphasis on monitoring.
- Increasing consultation, communication and public information and education.

Habitat Management Director Dennis Deans says the use of Green Plan resources—through the Fraser River Action Plan and the Skeena Green Plan—will provide the tools necessary to transform this vision into a reality in the near future.

**SEP**

A SEP Working Group was established in December, 1994 to prepare detailed proposals for implementation of decisions arising from the Program Review. Chaired by SEP Director David Griggs, the eight-member working group has been working to achieve a number of goals:

- Budgetary targets over the five-year period of Program Review.
- Options for SEP cost-recovery. The group has been examining a wide array of measures, including fishing licence surcharges, entry fees at SEP facilities, sale of fish and eggs, sale of SEP educational material and promotional items, and charges for technical and advisory services.
- Strengthening of the management-by-results and performance measurement and reporting processes within SEP.
- Examination of the merits of re-establishing an external SEP board.

Members completed their work in March, and have forwarded their proposal to the Regional Director General for review.

# OPERATIONS

Operations Branch currently has two teams in place—the Organization Team and the Long-Term Strategies Team. The Organization Team is chaired by Operations Branch Director Paul Sprout and comprises 25 staff members from each of the sectors and all levels in the Branch. Formed to address some of the issues arising from the branch's 1993 reorganization, the team has the following goals:

- to develop a clear definition of staff roles and responsibilities for each of the sectors.
- to devise ways of building fair levels of accountability into the organization.
- to develop proposals to resolve some of the issues currently facing the branch.

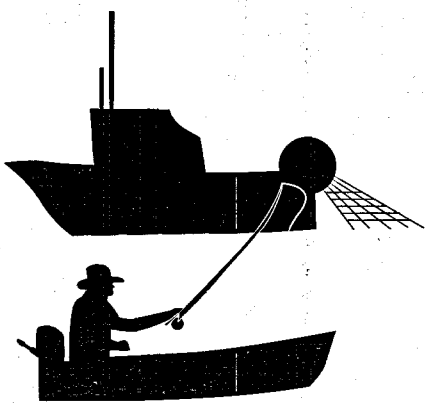
A key priority of Operations Branch is to implement responses to the Fraser River Sockeye Public Review Board.

The nine-member Long-Term Strategies Team, chaired by Fraser River Area Manager Dick Carson, was formed to provide the regional framework for implementing the National Program Review. Some of its challenges are identifying where and how savings can be achieved over the next four years, as well as developing a strategic plan to ensure the branch is providing more efficient and effective services to clients.

Carson says a major impetus of the strategy is to realign programs with DFO's core mandate of conservation.

"Through a series of workshops our team has identified long-term opportunities and benefits in keeping with our increased focus on conservation and protection of the fisheries resource. We are now receiving input from staff and industry to include in the implementation plan for 95/96, and for a longer-term plan for the subsequent three years," says Carson.

The team has identifies a total of 82 opportunities for fisheries management. These include a wide range of options, including the use of multi-year fishing plans, local area management through consensus boards, court-directed fines to benefit the fisheries resource, commercial fleet rationalization and the increased use of ticketing as penalties for offences.

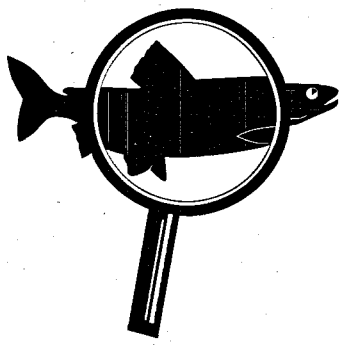


An important factor in streamlining how the department conducts business is the application of new technology. The team has evaluated, for example, some of the new technologies available to issue licences, which would result in more efficient service to clients.

One option the team has developed for internal operations focuses on consolidating administrative, information technology, training and related functions into a single group called Program Services. Pooling these services would reduce the administrative burden of field officers and provide them with more time and opportunity to fulfil their operational functions.

Operations Branch staff who have suggestions or recommendations are encouraged to pass them on to team members or to Dick Carson.

# INSPECTION



Inspection Branch is going through a number of significant changes. Four principal ways in which the branch will be reorganized are through:

- Streamlining inspection services.
- Consolidating laboratories and centres of expertise.
- Rationalizing field inspection programs.
- Redesigning the import inspection program.

Pacific Region Inspection staff will be providing data and information to the national Lab and Field Review over the next several months. Employees will also be asked for advice on the best way to implement measures in the region.

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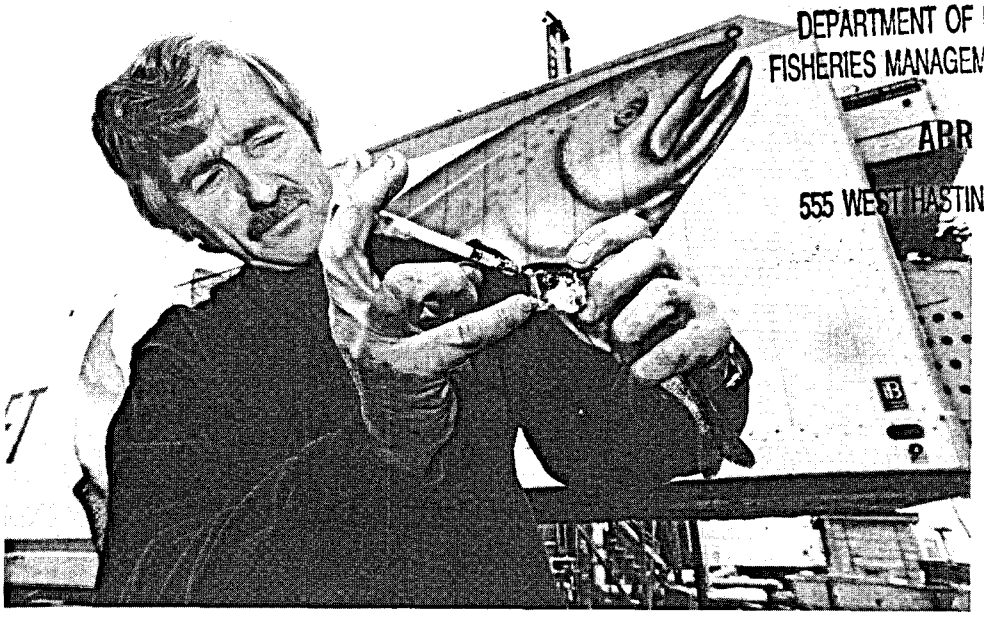
# POLLUTION TESTS TO BENEFIT CHINOOK





*In the shadow of a giant salmon emblazoned on the side of a mobile lab, George Kruzynski takes a blood sample from a juvenile chinook. Blood chemistry is one way of determining the health of the fish used in the study of the effects of pulp effluent on chinook.*

You might call the whole project an exercise in fishy karma.

Behold: a glistening 15-metre truck trailer to be pulled by the finest Kenworth money can buy.

On its side leaps and churns a chinook twice the size of the Kenworth cab. And emblazoned across the entire affair in letters two feet high: Overland Seafood Market.

In a former incarnation it was a mobile marvel, built to bring fresh fish right to your door, tastefully displayed in refrigerated glass cases. Now it's a DFO laboratory, aimed at enhancing fish stocks.

"There is some kind of quirky irony to all this," says George Kruzynski, a research biologist at West Van Lab. He and fellow biologist Ian Birtwell are supervising this uniquely housed project aimed at studying the effects of pulp mill effluent on chinook salmon in the Fraser River.

"Because of budget constraints we had to be creative," he says. Hence, the conversion of a rolling fish market into a rolling lab. In just three months, Kruzynski and his associates transformed the trailer into a mobile laboratory, complete with water pumps, generator, an instrument to control dissolved oxygen and six "doughnuts"—large fibreglass ring-shaped tanks filled with

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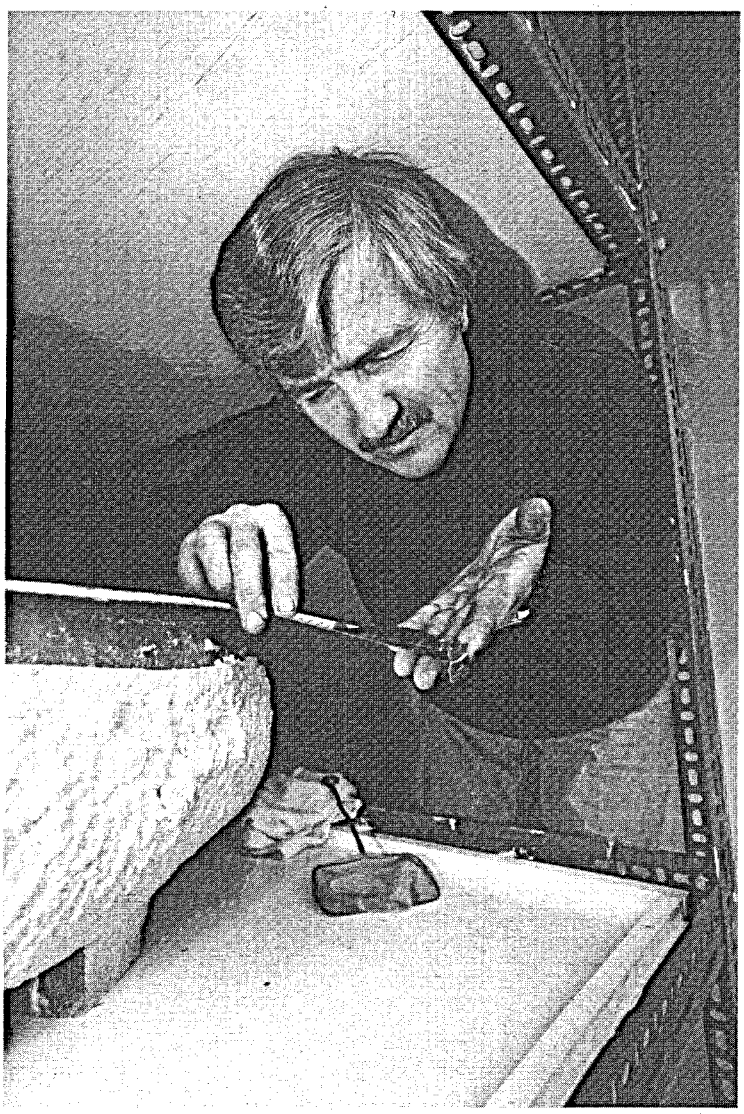

*Biologist George Kruzynski measuring the length of a juvenile chinook. Records are kept of fish length and weight before and after the study.*

flowing water which stimulates the river's action for the juvenile chinook being tested.

The lab was set up recently on the banks of the Fraser River adjacent to the outfall site at Northwood Pulp and Timber, four kilometres north of Prince George.

"This is not to cast any aspersions on Northwood," Kruzynski explains. "But we know chinook salmon stocks have not been rebuilding in the Fraser as quickly as anticipated and everybody wants to know why. Pollution many be one of the contributing factors, and pulp mill effluent is likely one component of that, but we're not sure to what extent."

Northwood was chosen because it is the pulp mill furthest upstream. It's the only place on the Fraser where water can be obtained free from mill effluent for testing purposes. It is also located on the migration route of several important upper Fraser salmon stocks.

Timing for the test is critical. They must be carried out in winter months when water flow in the river is lowest, and ice, which could interfere with oxygen levels in the river, has not yet begun to form.

Effluent-free water from the Fraser was pumped through the "doughnuts" (or annular raceways).

Mill effluent is added in various dilutions, from two to 12 per cent. Juvenile chinook raised nearby at Penny Hatchery were exposed to the solutions, and carefully compared to a control group of fish exposed to river water only. Biologists are looking for changes in skin mucous and gill enzymes, symptoms of immunity loss and respiratory distress. Behavioral changes which might make chinook more susceptible to predators such as burbot are being monitored—do the fish school differently; are they less likely to seek cover when startled; do they seek quieter waters because they are weaker; how well do they tolerate salt water?

Kruzynski says the project is studying just one of the many factors which may be contributing to the decline of some salmon stocks in the Fraser.

"Increasing water temperatures because of global warming, reduction in water flows, over fishing and pollution from a number of sources—municipal sewage, agricultural run-off—they all have an effect on the productivity of the Fraser. Mill effluent is just one factor, and even that we don't know enough about," he says.

Last winter when Kruzynski and his colleagues conducted a dive survey near Northwood, scientists knew little about chinook behaviour in mill outflow dilution zones. They confirmed that chinook salmon did not avoid the effluent. In fact, the fish were found in equal numbers upstream and downstream of the discharge, thus increasing their exposure to potentially toxic effluent compounds.

Eventually, the data collected will be used to review environmental standards for pulp mill effluent.

Interest in the study has generated funding and expertise from a variety of sources. Of the approximate $219,000 spent on the project in 94/95, $180,000 comes from the Fraser River Action Plan. IOS and B.C.'s Ministry of Environment, Lands and Parks are also contributing resources. Two biologists from the U.S. National Biological Service Columbia River Laboratory will be conducting new stress tests, and members of the Spruce City Wildlife Association in Prince George have volunteered their services for site preparation and data collection.

If all goes well and the mobile lab proves its mettle, DFO plans to have it on the road again in other B.C. regions, studying Fraser River salmonids and their habitat. ■

# NEW RESEARCH YIELDS WEALTH OF KNOWLEDGE ON SALMON MIGRATION

For the last 40 years, fisheries scientists assumed that salmon in the North Pacific Ocean swam south to get a break from the icy wintry temperatures.

In fact, just the opposite is true, as demonstrated by a major research project carried out by Canadian and Japanese scientists in the North Pacific since 1991 to examine the links between temperature and salmon distribution.

"What we have found is reverse migration," says Dr. David Welch, a research scientist at the Pacific Biological Station and DFO's representative on the cooperative research venture. "Salmon are the only animal we know of that goes north in the winter, presumably the result of strong evolutionary selection."

The research has yielded a wealth of information on the interaction of Pacific salmon with their environment in the high seas, and will undoubtedly have a major impact on fisheries management in the future.

Welch said the research results are an important first step toward developing a better understanding of the effects of climate change on Pacific salmon, and what impact global warming might have on the production dynamics of salmon.

"We started out looking at some cosmic questions here—what will climate warming do to salmon and how many salmon can the ocean support?"

As Welch points out, there is an abundance of research on virtually all aspects of the life cycle of salmon in its fresh water phase. However, scientists know relatively little about what happens to salmon in the high seas, where they spend a full two-thirds or more of their life.

"Why salmon are distributed as they are, and the direct experimental measurement at sea of the factors influencing the distribution are questions that have rarely been addressed," says Welch.

Welch began working with colleagues from the Fisheries Agency of Japan in 1991 in an attempt to unravel some of the mystery surrounding the oceanic distribution of Pacific salmon. The joint work with Japan began after Welch first chartered the Russian research vessel TINRO in the spring of 1990, and travelled to the Gulf of Alaska to examine what oceanographic factors might be influencing the distribution of salmon.

"DFO started the research program in 1990 in order to start looking at the issue of how many salmon we can put into the ocean," says Welch. "A number of us felt that the issue of establishing how many salmon can be supported by the ocean, and which countries' salmon these should be, were sure to develop in significance over the next decade."

With about one-quarter of the salmon production already coming from low-value species released by hatcheries from other countries (chiefly pink and chum), it is important for Canada to determine whether competition from these salmon could reduce the productivity of Canada's salmon populations. And with climate warming expected to occur, assessing the effect of changes in climate on salmon production is paramount.

During the 1990 spring survey, Welch used a rope trawl specially developed by the Russians to sample salmon in the open ocean. Using the data collected and a series of models developed over the next 18 months, Welch and his colleagues demonstrated that salmon exhibit a species-specific behavioural response to temperatures, and that they actively avoid warmer areas. The sampling undertaken in the spring, showed that the "thermal limit" varies by species: 10.4 C for pink and chum salmon, 9.4 C for coho and 8.9 C for sockeye salmon.

Welch says the temperatures eliciting this avoidance behaviour are much lower than were previously thought. And the sharp decline in abundance (a drop to one to two per cent of average abundance in less than 1 C) suggests that thermal barriers form an effective limit to the offshore distribution of salmon, and can

CONTINUED ON PAGE 8

THE SOUNDER

THE SOUNDER IS THE STAFF NEWSLETTER OF FISHERIES AND OCEANS, PACIFIC REGION.

Your contributions are welcome. Please send story ideas, photos and letters to the editor.

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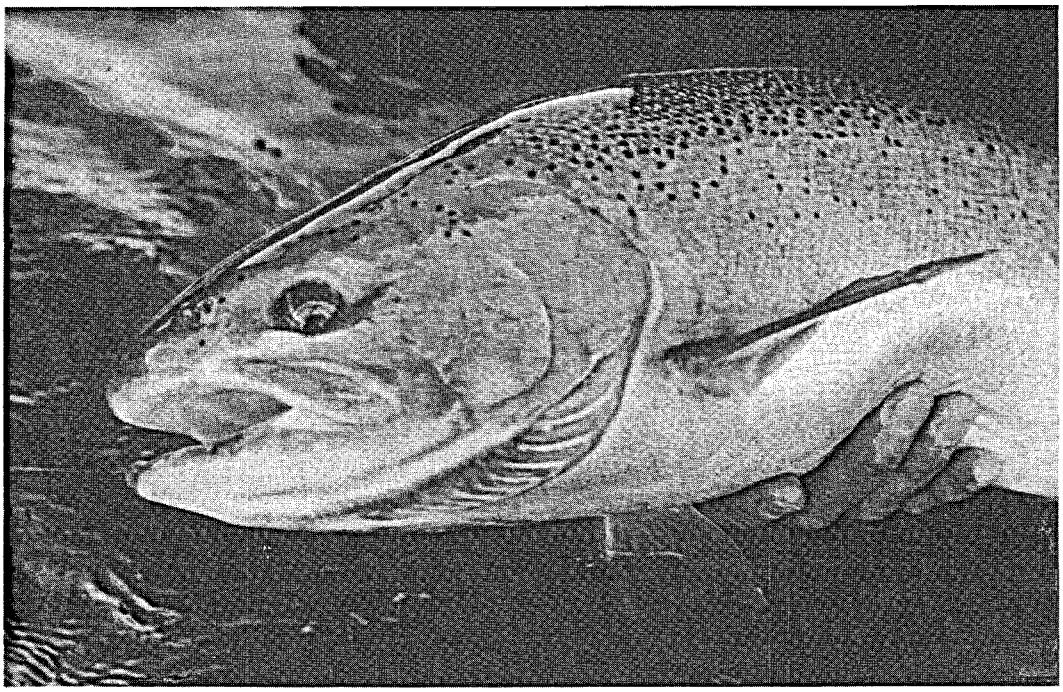
# FISHERIES WORKSHOP A HIT



*The Sustainable Fisheries Program is introducing more stock-specific fisheries management to prevent overharvesting less abundant stocks such as Skeena steelhead.*

Blizzards couldn't keep them away.

Despite driving snow and freezing temperatures, more than a hundred people participated in a recent workshop in Terrace organized by the Skeena Watershed Committee to address fisheries issues of concern to stakeholders and residents of the Skeena watershed.

The two-day workshop—the first of three planned by the SWC—featured presentations by DFO and provincial biologists and scientists on enhancement and protection of Skeena salmon stocks and their habitat. A multitude of projects are currently being carried out under the Skeena-Kitimat Sustainable Fisheries Program, a DFO initiative to achieve sustainable fisheries in these two watersheds.

Workshop chair Greg Taylor called on participants to bring forward any innovative ideas they might have to help the SWC in guiding effective management of the watershed's fisheries resource. He also emphasized the importance of community participation in future planning to create a healthy, sustainable fishery for the benefit of everyone living and working in the watershed area.

The federal/provincial participation provided workshop attendees with a better understanding of the science underlying the future choices that will have to be made in the management of the Skeena watershed's salmon resource. Scientists and biologists identified a number of critical issues that are necessary to ensure the sustainable management of the Skeena's salmon resource:

- Understanding salmon life histories and the importance of genetic variation.
- The importance of taking a long-term view when identifying the relative current stock status of salmon and steelhead in order to avoid "snapshot biology."
- The escalating impact of Alaskan harvests on all species.
- Understanding the problems associated with habitat areas.
- The importance of maintaining genetic diversity.
- Setting priorities, assessing the benefits and costs, and maintaining future options are key ingredients when developing enhancement options.
- The fact that economic activities have the potential to impact biodiversity must be recognized by communities, which must in turn be willing to assess the risks involved.
- There is still time to make reasoned, proactive choices given the relatively healthy status of the Skeena's salmon resource.

A discussion session on the second day of the workshop provided participants with the opportunity to develop directions for the future through priority setting and risk analysis for conservation, habitat and enhancement.

The next workshop will focus on selective harvesting, and will be held in Prince Rupert April 22 and 23. ■

# CREATIVE USE OF FINES HELPS ENHANCEMENT EFFORTS

On a hot day in August of 1993, a Campbell River man noticed a yellow substance flowing through a culvert from a municipal storm drain on his property. From there it was flushed into the Campbell River. The substance turned out to be chromium, one of the most toxic compounds known to fish.

The chromium had spilled from a strip tank used in taking chromium from items such as hydraulic cylinders for rechroming at a local plant, Island Industrial Chrome. An employee took a hose to the material to wash it away. The chromium flowed under the foundation of a plant building, and then into a pipe system. From there it was pumped into a municipal storm drain leading to the river.

This story is an all-too familiar one: a company with no plan for dealing with spills, and workers who may have meant well but were unaware of the full consequences of their actions. Unfortunately the harm to countless fish and their habitat can be fatal, or take years to reverse.

Over the past several years, innovative agreements ordered by B.C. provincial courts to companies and individuals who damage fish habitat go beyond merely imposing fines. Amendments to section 79.2 of the Fisheries Act in 1991 allow for a number of environmentally friendly sentencing alternatives. These can include orders to a culpable party to change the way it conducts business, undertake remedial work to repair damage, or pay money to the Crown for enhancement work and monitoring activities.

For the Campbell River company, the courts ordered a $3,500 fine plus payment of $16,500 to DFO to be used for local fisheries projects on the Campbell River. A total of $11,500 was directed toward a pen-rearing program for juvenile chinook salmon under the supervision of the Quinsam Hatchery. The remaining $5,000 was directed to improving fish habitat at the entrance to the river. The company also invested $100,000 in plant changes, and issued an apology to the community.

In another case, a company developing a new subdivision in Surrey dumped sediment-laden water into Bear Creek, a tributary of the Serpentine River. Following a joint investigation by DFO habitat biologist Bruce Reid and the city of Surrey's environment section, Dawson Lands 1987 Ltd. modified its sediment control procedures to guard against future deposits and pleaded guilty last fall. The company received a $1,000 fine, and was ordered to contribute an additional $10,000 to the Serpentine Enhancement Society, which collects salmon eggs and raises fry at the Tynehead Hatchery for release throughout the Serpentine system. The money is being used for improvements to the well system at the hatchery.

Recent work by Scott Trent, a habitat technician at North Coast, helped result in the conviction of a Terrace resident who deposited earth and fill in Morgan Brook, a fish-bearing stream running through his property. Ninety per cent of the $7,500 fine was directed to the Terrace Salmonid Enhancement Society. The money is being used for fish food, tagging equipment and maintenance of the hatchery operated by the society, which collects coho and chinook eggs and raises fry for release into the Kitsumkalum and Cedar rivers, part of the Skeena River system. The Terrace man was also ordered to restore damaged fish habitat at Morgan Brook, at a cost of about $27,000.

John Clarke, legal counsel to DFO, estimates about 20 habitat prosecutions have involved the use of creative fines that promote conservation and protection of the fisheries resource. These range from the smaller companies and individuals cited above to forest giant Fletcher Challenge, Dairyland Foods, and the Department of Municipal and Community Affairs in the Northwest Territories. In all cases, court orders resulted in substantial sums that are being put right back into the resource.

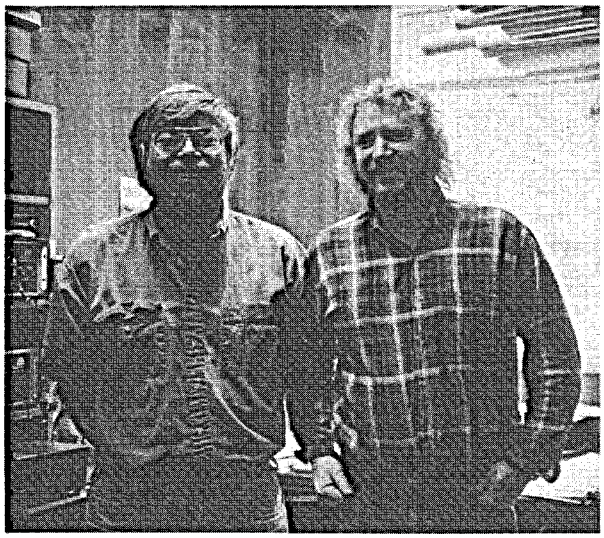
Clarke says these types of sanctions have advantages all around. Although the court must order some fine, the sum can be reduced to reflect monies paid under S. 79.2 for fisheries-related purposes. Companies and individuals are usually much more receptive to paying fines for fisheries-related purposes. The lesson may be learned the hard way, but it brings home the message that if the environment is damaged, offenders must take responsibility for cleaning up their act. For DFO, it's a golden opportunity to come up with specific remedial plans, with cost estimates, or to identify appropriate enhancement activities.

DFO has been assisting provincial courts by submitting draft orders at hearings, or examples of this novel approach to sentencing. Clarke notes that the provisions of S. 79.2 are limited only by the imagination of the counsel and court. He adds that judges have unanimously welcomed the expertise provided by DFO in the draft orders, which they can then incorporate into judgements.

While the challenge to DFO resources is considerable—given the habitat research required—the results can pay big dividends to the resource over the long term. For assistance in preparing useful court orders for habitat offenders, please contact John Clarke (666-0177) or legal counsel Nancy South (666-2882).

# CULTUS LAKE RESEARCH AIMED

*By Harb Kaila*



*Biologists Jeremy Hume (left) and Ken Morton are studying juvenile sockeye in the Fraser watershed.*

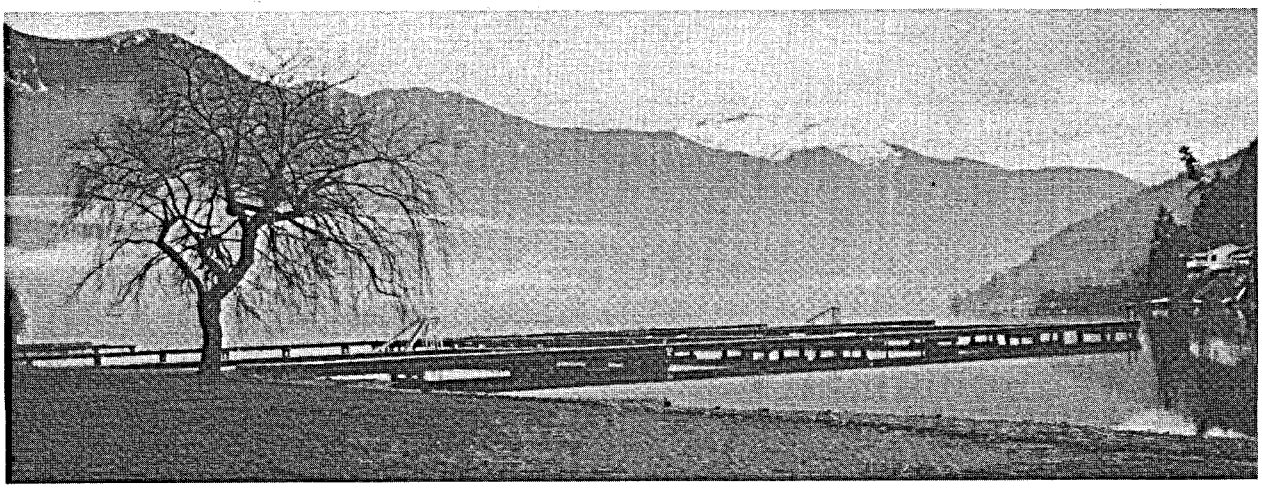
DFO's Cultus Lake Research Laboratory is an ideal base for fisheries work in the economically important Fraser River drainage basin.

Situated just adjacent to Cultus Lake, the lab has immediate access to an ample supply of fresh water for a variety of salmon research projects. Staff can also test new equipment and methods here prior to conducting research out in the field. Sockeye are of particular importance to lab researchers, given that the Fraser River lakes system is the largest producer of sockeye salmon in the world. It is here, in several nursery lakes within the Fraser River lakes system, that the sockeye salmon's young rear before heading out to sea. As such, the status of these nursery lakes is important to the total production of Pacific salmon.

Ken Morton and Jeremy Hume are two biologists at the Cultus Lake Lab who are undertaking the task of studying juvenile sockeye production in the Fraser watershed. Morton and Hume, along with technician Steve Maclellan, are part of a multi-disciplinary team headed by Dr. John Stockner and Ken Shortreed from the West Vancouver Lab. This team is currently conducting their research on sockeye production in three of the watershed's largest lakes: Chilko, Quesnel and Shuswap. Although their research is not limited to the Fraser watershed, the team is concentrating on this specific area because of its importance to the West Coast fishery. This team investigates many variables, including lake physics, water chemistry, plankton and fish. Morton and Hume's research is necessary to obtain a clear understanding of the biological processes occurring within the lake. The ultimate goal is to obtain an accurate estimate of the lake's capacity to support juvenile sockeye in order to define an optimal adult escapement level.

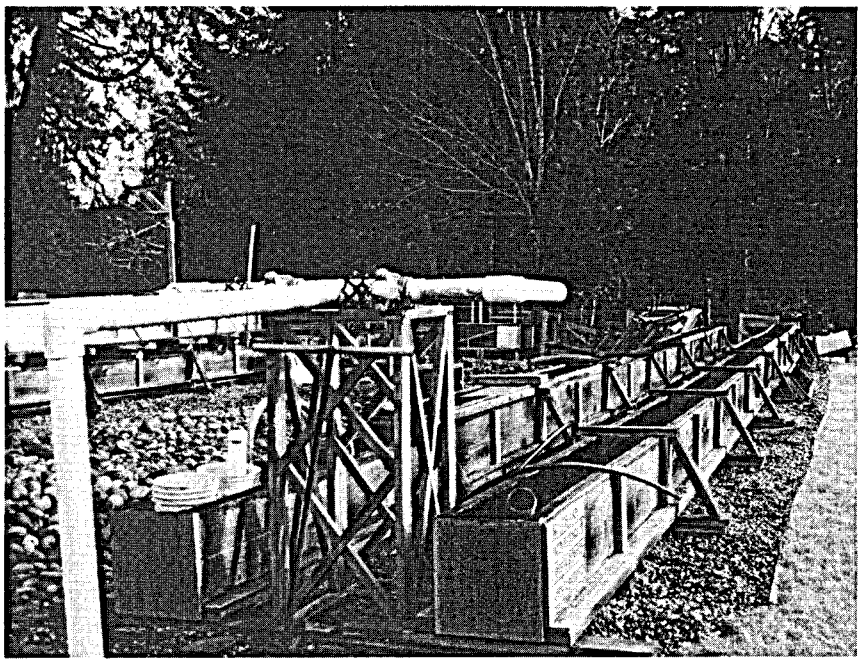
Morton's research focuses on the microscopic zooplankton community. Zooplankton are the predominant food of juvenile sockeye and are key in determining the density of fish a lake can support. His work entails collecting samples of water in each of the lakes and estimating amounts and species of zooplankton in the lakes. By examining specimens, he is able to provide an accurate count of the zooplankton living in the lakes.

The equipment used to collect and measure zooplankton is by no means state-of-the-art. The two tools used are simple but nonetheless effective. The first is a fine meshed Wisconsin net that is hauled vertically through the water column. The second is a clear acrylic box called a Schindler Trap which is used to sample at specific depths. In the lab, a computer-based video



*DFO's research lab is tucked away adjacent to scenic Cultus Lake*

# AT SUSTAINING SOCKEYE LEVELS



*An ample supply of water from Cultus Lake is funnelled into troughs, providing scientists with the opportunity to test new techniques in nutrient research.*

microscope is used to identify and size the various zooplankton species. These data are then compared to zooplankton found in sockeye stomachs in order to determine the impact of the grazing sockeye on their food resource.

Hume's research focuses on the abundance, distribution and growth of juvenile sockeye. Hume and Maclellan use a sophisticated hydroacoustic system to acquire fish distribution and abundance data along several cross lake transects. Due to fish schooling behaviour during the day, this work must be conducted after dark. Using a large midwater trawl net behind the boat, fish samples are also collected.

These samples serve a number of purposes. First, they allow Hume to determine the species composition of the population he is detecting because the hydroacoustic equipment does not indicate the species of fish being detected. Second, the size of fish being detected by the acoustic equipment is confirmed from trawl samples. Finally, the trawls provide samples for stomach content analysis. This research is extremely useful to fisheries managers to help forecast future run sizes.

The results of this research appear promising. For the first time in recent history, sockeye runs to many Fraser lakes are approaching optimal levels. It is estimated that Shuswap, Chilko and Quesnel Lake optimal escapement levels lie between 1-1.5 million. The research team is defining optimal escapement levels and expanding the understanding of processes within the lakes that influence the lakes' capacity to support sockeye. By understanding how a lake works, the team is attempting to increase the production capacity of Chilko Lake with the application of liquid nitrogen and phosphorous. Consequently, changes to the zooplankton community are evident.

However, results regarding increases in sockeye production must wait for adult returns. While fertilization will stop this coming year, the team is hopeful that it will continue research on the Chilko Lake to determine whether it reverts back to its original state (before fertilization) or whether it will continue to support higher escapement levels. The results of this research project are important contributions to our knowledge of the resource, and will ultimately benefit stakeholders and the economy.

There are still many unanswered questions about such a valuable natural resource. In these uncertain times the team does not know which lakes will be on the agenda next. However, in light of these uncertainties, Morton and Hume's objective—"to make sure that eventually all sockeye lakes in BC are at their optimal levels—" has not changed.

*– Harb Kaila is a Simon Fraser University co-op student currently working in Communications Branch.*

CONTINUED FROM PAGE 3

limit distribution to a relatively small area of the North Pacific. The result is a Catch 22 situation: if salmon are limited to areas in which they can graze for food, putting more salmon into a fixed area of the North Pacific may increase competition for food, especially if the climate warms and shrinks the area available for grazing.

Based on these results, Canada and Japan expanded this work in 1992 to look at the whole North Pacific in 1992. A total of 11 research cruises were involved, including the first ever trans-Pacific mid-winter salmon research cruise.

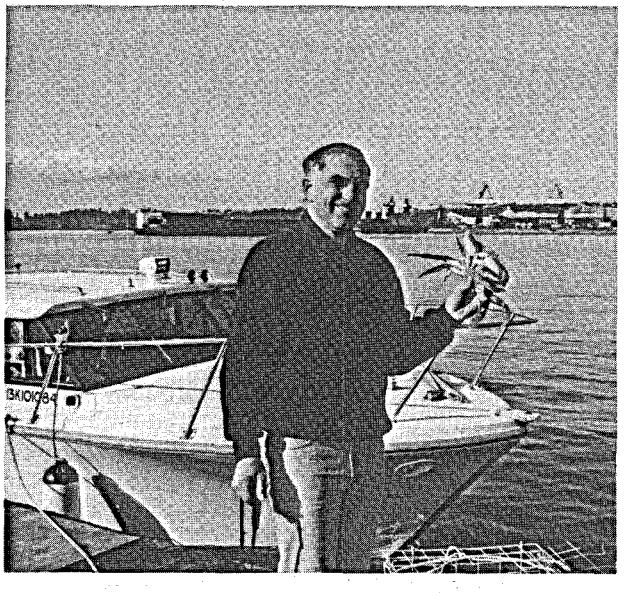
The results confirmed and strengthened the general findings from the 1990 research. The expanded research also found salmon were migrating nearly 1,000 kilometres north in winter to get into very cold waters, and then migrating south in spring and summer to move into warmer waters. It was this reverse migration that was so surprising to the scientists involved, both because its existence was previously unsuspected, and because the behaviour was so different from other animals.

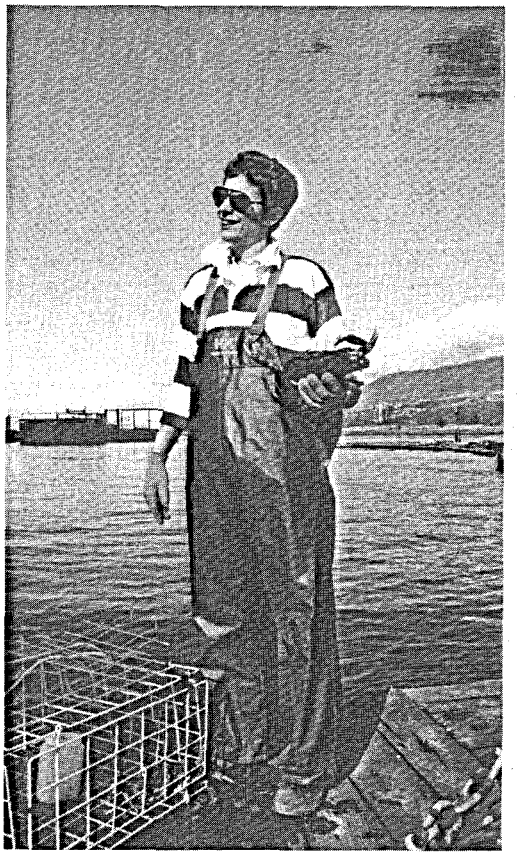
While the jury is still out on why salmon respond so sensitively to temperature, the implications for future production and management of salmon stocks could be significant.

With climate scientists predicting that the average global temperature will rise 2-3 degrees Celsius within a hundred years as carbon dioxide levels in the atmosphere double and trap more of the sun's heat, salmon could be pushed further north. This increasing northerly migration could restrict the amount of the North Pacific available to grazing to about half of its current area in the summer, and reduce it to zero in the winter. This in turn could force Canadian salmon to either begin migrating into the Bering Sea or to vertically migrate hundreds of metres to avoid the warm surface waters; neither behaviour is currently observed for any species except chinook salmon. The only other alternative would be for all the salmon species to try to tough it out in warmer waters, something they currently do not do.

The next leg of the research will involve further research in the North Pacific in fall and winter months, and perhaps subsequent work in the Bering Sea.

Consensus is now developing among salmon producing countries to expand this work to a truly cooperative effort involving all salmon producing countries under both the North Pacific Anadromous Fish Commission and the Pacific Marine Science Organization (PICES). Welch believes further information on what forces shape the extensive high seas migrations and ocean distribution of salmon will be essential to informed management of these resources in the future.





*Biologists Wayne Knapp and Karen Hutton (Fraser River Division, Habitat) in the Burrard Inlet sampling crab for dioxins. The work is being carried out under the Burrard Inlet Environmental Action Program aimed at cleaning up the Fraser and its tributaries.*

Photos by L. Nikl

# BRANCH REVIEWS

In the last issue of The Sounder we looked at some of the initiatives being carried out within Pacific Region branches in keeping with DFO's changing direction. The following outlines briefly departmental efforts in defining new objectives and desired outcomes.

## COMMUNICATIONS BRANCH

Work is under way on a three-phase review of communications to achieve consensus on identifying where improvements can be made, and to find workable solutions and ways to implement them.

Over the last few months, interviews were held with Pacific Region communications and non-communications staff, stakeholders and media as part of an issue identification survey. Task force teams comprising communications and non-communications staff are being formed to address the four basic communications systems DFO has in place: employees; stakeholders/partners/clients; the media and; interested members of the public. An additional team will study the application of information technologies to communication processes.

A roll-up of the five task force reports and preparation of an overall framework for the integration of the communications function is expected to be complete by May.

## PROGRAM PLANNING AND ECONOMICS

The branch has three key priorities in 95/96: industry rationalization, rationalization of the consultative process with stakeholders and revenue generation.

Industry rationalization will be the focus of a workshop April 20/21, involving clients primarily from the salmon gillnet and seine gear sectors. Issues will be identified and a process established to lead into a series of workshops in the fall. The branch will be advising the minister on options to restructure the fleet by the end of November.

Simplifying and improving the efficiency of the consultative process is overdue, says Al Wood, director of PP&E. "Currently there is an incredibly large number of advisory groups, and our annual consultative expenditure is more than $3.5 million. Our task is to streamline the process, to ensure the process is more representative of the sectors."

Revenue generation in general is seen by DFO as a key method of both offsetting management and other costs associated with management effort, and providing a downward pressure on the demand for services. The branch will be specifically examining revenue generation through an increase in licence fees.

## MANAGEMENT SERVICES

MSB is working closely with the national team on new systems development, with the goal of providing a re-engineered service at a lower cost to clients, within a smaller structure.

The services provided will be designed to empower the manager through increased delegation, better and improved information systems, streamlined procedures and value-added services. The philosophy embraces the idea that new systems and streamlining of processes, along with revamped procedures, will result in an acceptable level of service to program managers. It is also expected that as business lines are reduced, the level of support services will be reduced.

MSB core functions will shift from the procurer of goods and services for managers to an advisory function to line managers on the most effective and efficient ways to deliver goods and services. This will likely mean an increase in delegation beyond the current Mastercard limit of $2,500.

Ron Faust, associate director of MSB, notes that the same time, a small core team of procurement advisors will be needed to prevent the passing of workloads to managers and to ensure proper management practices.

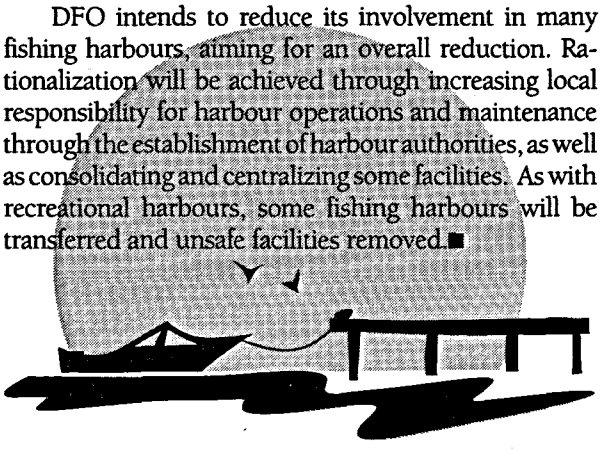
Systems will also have to be developed which will streamline and replace current practices. The procurement function would also have to be integrated with the payment processes utilizing existing tools such as Mastercard and new tools such as direct payment currently used by the commercial banking system.

## SMALL CRAFT HARBOURS

Over the next five years, Small Craft Harbours will eliminate its responsibilities and costs associated with operating and repairing its recreational harbours, and will rationalize its system of fishing harbours.

Director John McNally notes this will be accomplished by increasing rates and fees to achieve full cost-recovery. Provinces, communities and the private sector will be offered the opportunity to acquire harbours, while unsafe structures that pose a public safety threat will be demolished.

DFO intends to reduce its involvement in many fishing harbours, aiming for an overall reduction. Rationalization will be achieved through increasing local responsibility for harbour operations and maintenance through the establishment of harbour authorities, as well as consolidating and centralizing some facilities. As with recreational harbours, some fishing harbours will be transferred and unsafe facilities removed.■



# SALMON FORECASTS ANNOUNCED

The forecasts for salmon returns to B.C. rivers in 1995 are in, reflecting natural cycles in abundance as well as the impact of unprecedented environmental conditions during recent years.

For Fraser River sockeye stocks, 1995 and 1996 mark years of lower abundance than the previous two years but compare favourably to recent cycle year averages. Returns of sockeye salmon to the river are based on four year cycles which have recently consisted of two years of high abundance followed by two years of lower levels. Given public concern regarding conservation of salmon resources on the Fraser, the department is taking a conservative approach to planning for the 1995 fishery.

Fraser sockeye harvests will be based on a conservative pre-season forecast return of 10.7 million fish. This forecast return has only been exceeded twice before on the 1995 cycle year and compares with 12.3 million sockeye in 1991 and 7.7 million sockeye in 1987, the two previous cycle years. The preliminary outlook for the sockeye return to the Fraser in 1996, the lowest of the four cycle years, is approximately four million fish. This is similar to the recent average return for this cycle year.

For the forecasted 1995 return of 10.7 million sockeye to the Fraser, DFO has set a spawning escapement target of 2.9 million fish. This escapement target may be adjusted in-season according to a prescribed schedule if actual returns vary from the pre-season forecast. DFO places the highest priority on achieving spawning targets, and accordingly will be taking a risk-adverse approach to management of all fisheries.

Pink salmon returns to the Fraser in 1995 are expected to be strong. In all, an estimated 20 million pinks are expected to return. DFO has established a corresponding spawning escapement target of 6 million fish. Since pink salmon returns are highly variable, these expectations are approximate and are intended for planning purposes only. Pink returns in even years (pink salmon return on two, rather the four-year cycles) to the Fraser are always very low and will not support directed fisheries in 1996.

On the west coast of Vancouver Island, sockeye returns to Barkley Sound in 1995 and 1996 are expected to be well below recent levels. For 1995, the total return is estimated to be around 300,000. Low sockeye returns to Barkley Sound this year are thought to be associated with the environmental event known as El Nino. Back-to-back El Nino in 1992 and 1993 resulted in warmer than usual water temperatures off Vancouver Island and brought large numbers of predators, such as mackerel, into B.C. waters during the migrations of juvenile sockeye to the ocean. These factors are likely to have resulted in low survival of the juveniles that would otherwise have returned as adults in 1995 and 1996.

Marine factors have had an even more negative impact on chinook stocks returning to the West Coast of Vancouver Island in 1995 and 1996. Chinook salmon returning to the Somass River in 1995, including those from the Robertson Creek Hatchery, are estimated to number between 20,000 and 30,000 compared to recent returns of some 100,000 in 1994 and 300,000 in 1991. Effects of ocean conditions and predation are expected to result in even lower returns in the 1996 season. Strong conservation measures will be implemented to ensure spawning escapement targets are achieved.

Many of the other chinook stocks in southern B.C. are also expected to be impacted by poor ocean survival conditions. The forecast for Harrison River chinooks, at some 60,000—65,000 fish, indicates a poor return from the 1991 brood year.

In northern B.C., sockeye returns to the Skeena and Nass Rivers for 1995 and 1996 and expected to reflect recent averages of about 2.7 million and 400,000 respectively. Pink salmon returns in the Skeena, at 1.9 million, are expected to be below average this season because of low returns and escapement in 1993 and 1994.

On the Central Coast, sockeye returns in 1995 are expected to be lower than the recent average. Forecast sockeye returns for Smiths Inlet and Rivers Inlet in 1995 are approximately 340,000 and 330,000 respectively. Expected pink returns to Bella Coola, at approximately 2.4 million fish, reflect the recent average.

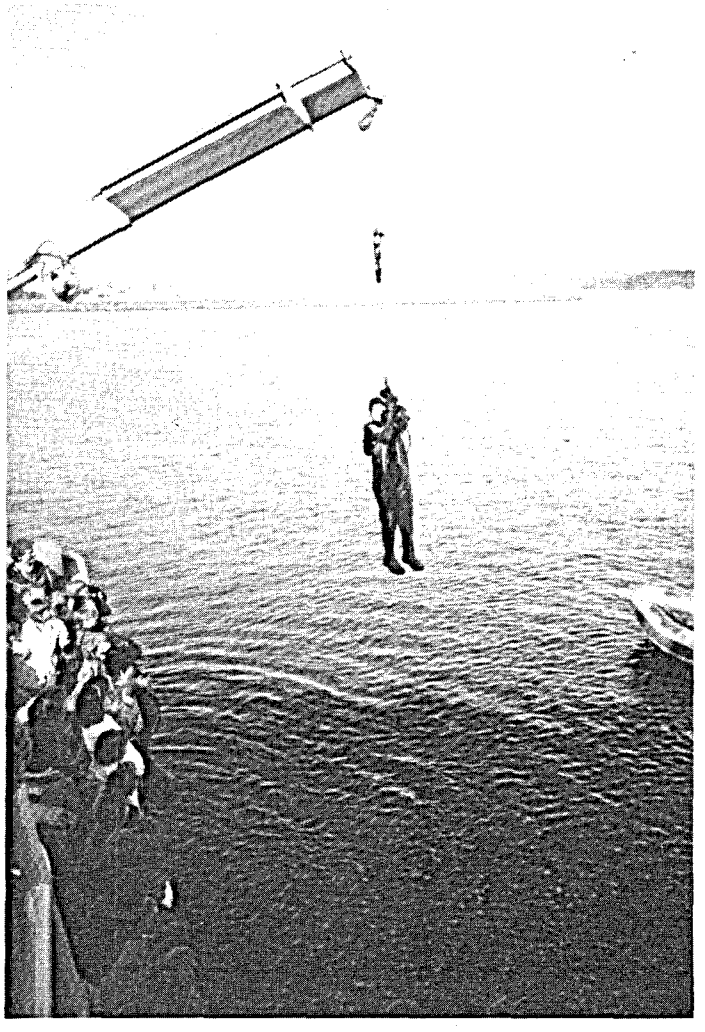
Forecast returns and escapements of salmon are, by their nature, uncertain. The numbers cited above are considered preliminary estimates of actual returns for use in planning for 1995 fisheries. DFO is at present continuing analysis of coho and chum salmon abundance, and information will be made available once the analysis is complete. Conservation concerns for certain coho stocks have resulted in specific measures such as harvest rate reduction and implementation of habitat restoration initiatives in the Strait of Georgia, as well as a sustainable fisheries program in the Skeena and Kitimat watersheds.

The department will be meeting with its advisory groups over the next six weeks to develop fishing plans consistent with the forecasts presented above and to ensure any conservation concerns are addressed. ■

# F.P.V. JAMES SINCLAIR COMES TO TOWN

It was big day for Grade 3 students at Campbell River's Sandowne Elementary School. Under the watchful eye of their teachers, Mary Kiddle and Gwendolyn Lewis (wife of C&P Field Supervisor John Lewis), two classes of Grade 3 elementary students recently toured the Fisheries Patrol Vessel JAMES SINCLAIR and the Canadian Coast Guard's POINT RACE at the Campbell River harbour.

For the past month, students at the school have been studying transportation, and both teachers had been trying in vain to access larger marine vessels for a field trip. Success came when the JAMES SINCLAIR became available at the close of one of the Qualicum chum openings to spend a day in Campbell River. With all her flags up and secured alongside the POINT RACE, the SINCLAIR looked very impressive to not only the students, but many members of the public who also stopped by for a look.



*Teacher Gwendolyn Lewis hangs suspended in the Campbell River harbour during a field trip by students to the JAMES SINCLAIR.*

The students were well behaved as Captain Murray MacGregor's crew patiently took smaller groups of students throughout the patrol vessel, stem to stern. Many comments were along the lines of "how much fun it would be to work on a ship like this" and "do they actually pay you to ride on this ship?" One of the most interesting spots on the ship was the bridge, where students were fascinated to see numerous large screens that resembled arcade video games.

It soon became apparent that the crew was having as good of a time showing off their vessel as the students had touring it. According to the crew, it was a nice break from the routine of patrolling the chum fisheries. It was also an excellent opportunity to show the public a little more of what DFO is all about. All parts of the vessel operation were toured and many very good questions were asked.

Students, teachers and accompanying parents all commented on how well kept the vessel was and how professional the crew. The weather turned out perfect for the occasion and immediately following their tour of the JAMES SINCLAIR, the students proceeded over to the POINT RACE where her crew similarly gave a first class tour of their cutter.

Afterwards, Captain MacGregor demonstrated life saving gear including donning a survival suit. To the joy of her students, Gwendolyn Lewis also donned a suit and at the urging of the two classes, took the plunge from the upper deck of the vessel with Captain MacGregor into the chilly harbour below. Students cheered at the bravery of their teacher with the cheering reaching ear piercing levels when their teacher was picked up by the patrol vessel's crane and placed on the vessel deck. While their teacher was suspended in the air there were many comments about this being the time for the students to ask her to go easy on their marks this term.

Though the classes have visited the local airport, local transit system, RCMP offices and travelled on the E&N Railway, all were heard saying that this was by far the best field trip ever.

A heartfelt thanks goes out to both Captain MacGregor and his crew aboard the FPV JAMES SINCLAIR, and to Captain Tom Burnett and his crew aboard the POINT RACE for their excellent tours of their vessels.

*– John Lewis*

# TIDINGS

### NEW TO THE DEPARTMENT

**LEAR, Steven** – Manager, Commercial Licencing, Operations Branch, Vancouver

**RUTHERFORD, Joel** – Financial Management Advisor, Comptroller's Branch, Vancouver

### APPOINTMENTS & PROMOTIONS

**FAULKNER, Gail** – Chief, Habitat Management, Operations Branch, Whitehorse, YK

**HARDING, Bob** – Habitat Field Technician, Operations Branch, Salmon Arm

**HENLY, Jim** – Fishery Officer, Operations Branch, Bella Bella

**LAWRENCE, Don** – Habitat Field Technician, Operations Branch, Williams Lake

**PANKO, Tim** – Habitat Field Technician, Operations Branch, Clearwater

**SULLIVAN, Melanie** – Senior Program Biologist, Science/Habitat Management, Vancouver

**BEDRY, Brenda** – Safety & Health Administrative Assistant, Personnel Branch, Vancouver

**DOMAE, Leanne** – Compensation Advisor, Personnel Branch, Vancouver

**EMMONDS, Steve** – Project Manager, Conuma River Hatchery, Salmonid Enhancement Program, Tahsis

**SEALY, Vince** – Assistant Fish Culturist, Kitimat River Hatchery, Salmonid Enhancement Program, Kitimat

**MACK, Blair** – Assistant Maintenance Superintendent, Snootli Creek Hatchery, Salmonid Enhancement Program, Bella Coola

**SPORER, Christopher** – Economist, Program Planning & Economics, Vancouver

**LEHMAN, Susan** – Assessment Biologist, Salmonid Enhancement Program, Vancouver

### DEPLOYMENT

**FARLINGER, Sue** – To South Coast Division, Manager, Aboriginal Fisheries, from Prince Rupert

### LEFT THE DEPARTMENT

**BEKEVICH, Tilly** – Finance, after 13 years, 5 months' service

**BRADBURY, J.D.** – Marine Division Fleet Workshop, after 29 years' service

**CAREY, Kapp** – Eagle Ridge Hatchery, after 10 years' service

**CASTELLO, Venita** – Inspection, after 6 years, 5 months' service, to transfer to the RCMP

**DOLLING, Christine** – Finance, after 4 years, 3 months' service

**HURST, Bob** – SEP, after 28 years' service

**KULAR, Raj** – Finance, after 16 years' service

**LE, Huy** – ISD, after 2.5 years' service

**RICH, Barbara** – Small Craft Harbours, after 16 years' service

**RYAN, Peter** – Radio Systems Division, after 36 years' service

**SEIGEL, Nancy** – Personnel, after 9 years, 7 months' service

**ZIOLA, Barney** – Small Craft Harbours, after 13 years, 9 months' service

### TRANSFERS

**CAMPBELL, Sonne** – Operations. Sonne has transferred to Ottawa to work as executive assistant to ADM Pat Chamut.

**GEE, Cathy** – Operations (Habitat Management), transferred to the Canadian Coast Guard in Ottawa.

**WOCHUK, Jerry** – AFS Officer, Operations, Prince Rupert. Transferred to DFO from Indian & Northern Affairs

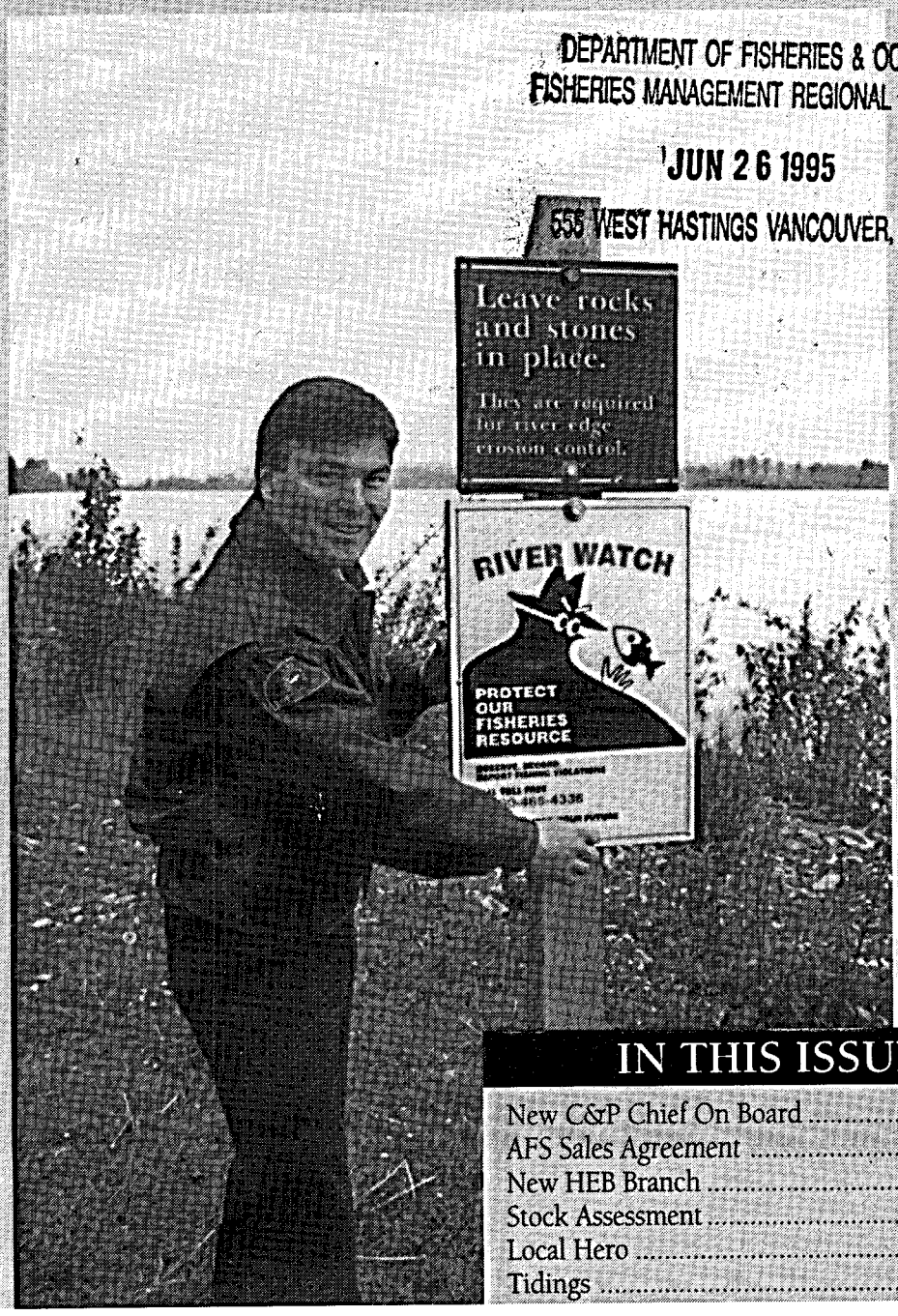
### IN MEMORIAM

**Albert Groat** died February 23, 1995, of a heart attack. Albert was a fishery officer for many years, mainly at Prince Rupert and Smithers.

# THE SOUNDER

VOLUME XL • NUMBER ONE • JUNE 1995

Mission fishery officer Andy Lewis (soon to be transferred to Terrace) admiring a DFO sign encouraging the public to report fisheries violations. The sign have been placed in GVRD watershed parks, and were developed by Mission fishery officer Scott Laverty and Communications Branch.

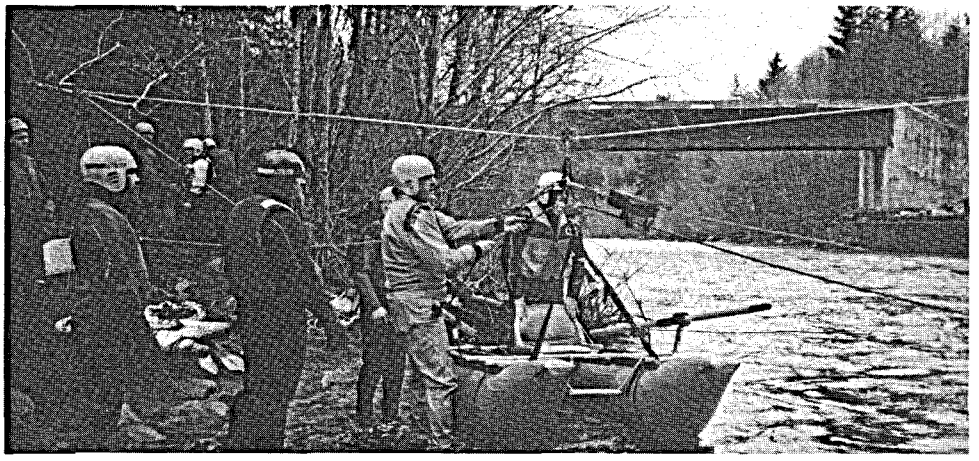





RIVER WATCH

## IN THIS ISSUE

# WATER SAFETY



Anyone working around or near water is probably aware of the potential perils they face. DFO staff, for example, could fill volumes with aquatic anecdotes recalling close calls. For many, being swept up into log jams, washed over waterfalls or trapped below counting fences are experiences they would rather avoid, or at least never repeat.

Learning how to work safely in water was the focus of a recent training program for more than a dozen DFO biologists and technicians who routinely work in aquatic environments.

Organized by Barry Finnegan, an assessment biologist at the Pacific Biological Station, the safety training program took place on the Nanaimo River, in typical swiftwater conditions. (Swiftwater is defined as moving water which includes tidal channels and surge).

"None of us, surprisingly, had ever received training in this area before, so it was long overdue," notes Finnegan, who spends a fair amount of time floating down rivers counting fish. "Without a doubt the training provided us with the skills needed to safely perform our jobs."

The swiftwater rescue technician (SRT) course was developed with input from DFO staff and provincial agencies, and is designed to meet the requirements of people and organizations responsible for all aspects of safety, search and rescue, as well as enforcement and tactical operations within swiftwater environments.

At the end of the course, participants were trained to:

- understand swiftwater dynamics and hydraulics
- swim in swiftwater safely
- manoeuvre around swiftwater hazards and obstacles at various river levels
- ford shallow swiftwater using various techniques
- cross deep, slow or fast moving water using basic equipment and techniques
- rescue endangered persons from the water
- perform CPR in the water
- identify signs and systems of significant medical problems related to cold water, swiftwater and accidents
- understand swiftwater-related physiology
- demonstrate climbing and technical rescue gear, signalling devices, ropes and flotation equipment
- understand the characteristics and application of helicopters and other specialized rescue equipment
- control small swiftwater craft by paddle, oar, motor or rope
- demonstrate boat-based rescues
- demonstrate communications systems
- demonstrate the principles of on-scene leadership
- organize a swiftwater rescue team

Anyone who would like further information on the course can contact Barry Finnegan at 756-7038. ■


THE SOUNDER

THE SOUNDER IS THE STAFF NEWSLETTER OF FISHERIES AND OCEANS, PACIFIC REGION.

Your contributions are welcome. Please send story ideas, photos and letters to the editor.

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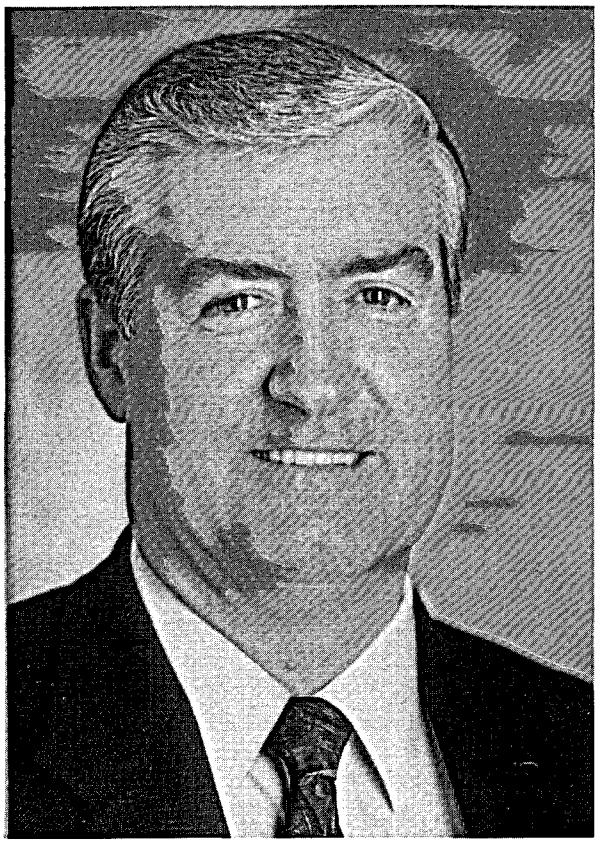
# NEW C&P CHIEF ON BOARD



*Stu Cameron*

*RCMP Superintendent Stu Cameron joined DFO as Chief of Conservation and Protection in February. He brings with him 26 years of RCMP experience in B.C. In an interview with The Sounder, he outlines the conservation challenges facing the department over the next few years.*

**Q.** The Fraser Board sent a strong message that inadequate enforcement was a significant problem in Pacific Region—that there were simply not enough fishery officers or surveillance operations in place. How will enforcement be improved to prevent a repeat of the problems associated with last year's salmon fishery?

**A.** Let me start by saying I have been apprised of the problems associated with the Fraser River and have a good understanding of what needs to be done to address the concerns raised by the Fraser River Public Sockeye Review Board on the issue of enforcement. We are actively pursuing all the Fraser Board's recommendations to ensure that an effective and credible enforcement level is re-established. We have begun with the development of meaningful work action plans and deployment of resources to fulfil this mandate. What is crucial is having enough people to do the job. We have increased our staff by 15 full-time fishery officers, which is over and above the number of officers we had in the region last year. We have also now completed the hiring of 33 seasonal indeterminate fishery officers who will be coming on board this month. We are making a concerted effort for this season to better coordinate Aboriginal guardian DFO and fishery officer efforts to ensure there is a more structured enforcement program, as opposed to two separate entities. To that end we are building enforcement protocols into agreements this year.

To improve surveillance, we will continue to optimize the use of marine services, and will enhance the use the charter patrol vessels to more effectively achieve enforcement goals.

Whether these measures are enough to circumvent all the problems of last year remains to be seen. However, our intent is to certainly utilize all our resources to the maximum and do the very best enforcement job we can.

**Q.** How will resources be deployed to target key problem areas such as the mid-Fraser River and Johnstone Strait?



**A.** We are now developing detailed work action plans identifying what sort of enforcement initiatives we anticipate. In turn we are presently identifying the resources needed to do that and attempting to get those resources where they will best be utilized. We have certainly looked at the problem areas and our plans will include worst case scenarios.

**Q.** There a number of revisions pending to the Fisheries General Regulations and the Pacific Fishery Regulations. Another approach is to increase the use of non-criminal administrative sanctions such as licence suspension. In what ways will these changes improve DFO's ability to control the fishery?

**A.** The changes are intended to expedite our ability to enforce the rules. A few examples are making hails mandatory so that accurate reporting of catches are a legal requirement. We will also be able to improve our ability to manage by species, by gear type and by class of vessel, thereby adding more precision to fish management. Another example mentioned earlier is building stronger enforcement requirements into the agreements signed with Aboriginal fishing groups. On the issue of sanctions, the objective is to avoid the often lengthy court procedures, and to target chronic offenders more quickly and directly. Sanctions are a more "punishment fits the crime" type of approach.

**Q.** The Minister has emphasized that protecting the resource cannot be done exclusively through policing. How will community effort be fostered?

**A.** I agree absolutely that we cannot rely on fishery officers alone to solve all the problems associated with the fishery. There needs to be an awareness out there, at a grass roots level, of fisheries issues and environmental values. Education is key. We must also enhance our own community involvement program, which we are now doing in terms of ORR - Observe, Record, Report - which will be expanded to 24 hours a day, seven days a week effective June 15. Our Communications Branch has embarked on a campaign to alert the public of this service. We will be enhancing our involvement in Coastal Watch programs and Crimestoppers, which will help increase public involvement in addressing enforcement concerns. I have been in contact with these groups and have asked our fishery officers to touch base with their communities regarding local crime prevention programs. There is no question that the information we receive from the public is invaluable in enabling us to set priorities and get the job done. We are probably not going to be able to respond to everybody's concerns. but if we have the information we can prioritize and make better use of our enforcement capabilities.

**Q.** How will the merger with the Canadian Coast Guard affect the department's enforcement program?

**A.** What it does for DFO enforcement is bring a whole range of resources, including vessels, helicopters, and aircraft, that can be utilized to our mutual advantage. For example, merging CCG vessels with our grey fleet will greatly improve marine surveillance. I am sure that our resources in turn will benefit their activities.

**Q.** What are some of the other challenges you see looming on the enforcement horizon?

**A.** When I started in February, I spent the first three weeks on the job meeting with fishery officers, listening to their concerns and getting their input on how to improve enforcement. I was impressed with the level of expertise and dedication that our fishery officers possess, and I hope in the days and months to follow I will be able to address their needs. One of my personal objectives is to get out in the field as often as this job will allow to hear first-hand what the enforcement, conservation and protection issues are from the people doing the job.

I really see 1995 as a transition year. There is a clear and identifiable need for resources, for better coordination of enforcement activities. We are still coming to terms with the reorganization that took place in Operations Branch in 1993 that mandated the role of fishery officers to more of an enforcement role. There is still a fair amount of transition that's ongoing in terms of those duties that officers were otherwise performing as generalists, such as habitat and fish management responsibilities. Another challenge is bringing resources up to speed through training and hiring new staff, as well as the coordination of activities associated with the Aboriginal Fisheries Strategy. A fair amount of this transition relies on field training, which puts additional pressure on the people already out there doing the job. It's going to take some time to work through that process. I would hope that by continuing to work out the wrinkles our enforcement role will be a much improved one in the upcoming years.

# SCIENTISTS HONOURED

Three DFO scientists from Pacific Region have recently been honoured for their scientific achievements.

Dr. Ed. Donaldson, a research scientist located at the West Vancouver Laboratory, will receive the Royal Society of Canada's Thomas W. Eadie Medal on June 16, 1995. The Medal is awarded for major scientific contributions in a variety of fields from Engineering to Applied Science. Dr. Donaldson is recognized as a world leader in the field of biotechnology research. The Thomas W. Eadie Medal is one of many honours Dr. Donaldson has received for his work.

Dr. Rick Thomson, a physical oceanographer working at the Institute of Ocean Sciences has been elected a Fellow of the Royal Society of Canada for his work on mid-ocean hydrothermal vents. A formal induction ceremony will be held in Ottawa this fall.

Dr. Bill Ricker, a retired scientist still working at the Pacific Biological Station will be awarded the Outstanding Achievement Award from the American Institute of Fishery Research Biologists (AIFRB) for his leadership in the development and communication of population dynamics and their application towards solving management problems. Dr. Ricker was also instrumental in translating the work of a number of Russian scientists. This accomplishment, coupled with his pioneering research, form the basis of modern fisheries science. He will receive his award at ceremony to be held at PBS June 13. ■

# AFS Sales Agreements On Track

With a May 15 deadline looming, it was full steam ahead for staff from the Aboriginal Fisheries Sector to put the finishing touches to sales agreements with Aboriginal groups.

That date was set by the Minister as part of DFO's response to the Fraser River Sockeye Public Review Board, which found that late signing of the sales agreement contributed to last season's poor management of the salmon fishery. This year, DFO has signed agreements with 50 Aboriginal groups in B.C. and the Yukon.

Staff efforts ranged from gruelling, round-the-clock negotiating sessions to a chartered fly-in to Rivers Inlet on a much-needed Sunday off to ensure the signed documents were well in hand.

Jim Wild, acting director of Aboriginal Fisheries, commended staff for the tremendous work involved in reaching agreement well before the fishing season begins.

"Everything came together remarkably well, which is perhaps not that surprising given that we began negotiations early in the year," said Wild. "Still, we came in just under the wire."

Reaching agreement under the Aboriginal Fisheries Strategy early in the season will help the department achieve its objective of preparing management and enforcement plans. The result is expected to be a much improved resource management system for 1995.

Overall, Wild notes that in many areas, AFS agreements have been remarkably successful and have resulted in improved resource management. He added that Aboriginal people demonstrated their commitment to conservation this year by working overtime to meet DFO's tight deadlines.

Wild points to the special chinook conservation commitments made by the Nuu-cha-nulth Tribal Council (NTC) on Vancouver Island as an example of strengthened cooperation between Aboriginal groups and the department.

"The tribal council made a significant contribution in negotiations to protect weak stocks," Wild said, noting that the 1995 allocations of chinook and sockeye to the NTC decreased dramatically from last year. This year, the chinook allocation to the NTC is 3,000, down from last year's 19,000 figure.

Similar to last year, sales agreements will be carried out in the 1995 fishing season on the lower Fraser River by the Sto:lo, and by the Musqueam, Tsawwassen and Burrard bands; in the Alberni Inlet-Somass River area on the west coast of Vancouver Island by the Tseshaht and Opetchesaht bands; and in the Skeena watershed by the Tsimshian Tribal Council, the Gitksan and Wet'suwet'en Watershed Authorities and the Ned'ut'en First Nation. There will be no expansion of the pilot sales program in 1995.

Allocations in 1995 are equivalent to last year's figures for the sales program, with the exception of chinook. Lower allocations reflect the department's conservation measures to ensure spawning escapement targets are achieved.

DFO has adopted a number of new approaches under the AFS agreements:

- The agreement with the Sto:lo includes an independent financial management system to ensure full financial accountability.
- Working toward developing an enforcement protocol specifying that Aboriginal fisheries officers work collaboratively with DFO in 1995, and that enforcement activities will be coordinated by DFO officers.
- The agreements include a dispute resolution mechanism to resolve in-season fisheries management issues. ■

*Aboriginal communities are involved in a wide range of fishery activities. Here members of the Ned'ut'en First Nation take fish samples.*

# NEW HABITAT AND EN

Travelling through the region to talk to staff is how David Griggs will spend the first several months as director of the new Pacific Habitat and Enhancement Branch.

Effective May 15, the regional Habitat and Salmonid Enhancement programs were merged into a single branch that will harmonize activities related to habitat and fish production. The move is intended to raise the profile of these activities as an integral part of the region's renewed emphasis on conservation. Griggs, the former SEP Director, is charged with getting the fledgling Habitat and Enhancement Branch up and running.

To face this daunting task, as well as to figure out how to deliver programs more "efficiently and creatively," Griggs plans to spend the next three to four months visiting local offices and asking staff for their ideas.

"I'm really serious about a consultation process where everyone has a chance to say their piece," says Griggs, who as SEP director liked to visit hatcheries to hold "bear pit" sessions with staff. "There are people


who have been doing these jobs for a long time and know a lot more than me about what can be done."

He hopes that by showing a willingness to listen, he can reduce the fear, trauma and resistance often encountered in times of change.

"People are threatened by change," he acknowledges. "There is a built-in opposition to change in government. There is no way to reward people for taking risks, so they question why they should change. I want to set up open communications in this branch. I think we can encourage innovation and motivate people to take risks."

Consultation has already begun. A branch meeting May 31 and June 1 in Richmond brought together staff from across the region to discuss a new vision/mandate. Discussions also focused on the work of study teams tackling implementation details in six areas: informatics; administration and business planning; fish production planning; partnerships and administrative arrangements; program integration; and policy development. The changes will be phased in over about a year, Griggs says.

Some new reporting relationships already exist. Dennis Deans, former director of Habitat Management, and the five area habitat chiefs now report to Griggs. It is proposed that area staff in the new branch report through a decentralized structure to Habitat and Enhancement's regional director.

The creation of the HEB has also triggered a change in the area managers' job. The area managers now report directly to Louis Tousignant, regional director-general, rather than to the regional director, Operations Branch, as previously. The area managers will coordinate regional programs at the area level on a day-to-day basis. They will communicate directly with branch directors and area staff to ensure awareness of what is happening in their assigned geographic areas.

A study team of area staff, led by Chris Dragseth, North Coast area manager, will recommend detailed roles and responsibilities for the area managers under the new organizational arrangement.

Over time, the reorganization will also integrate Green Plan activities related to habitat and enhancement - from the Fraser River Action Plan and the Habitat Action Plan - into on-going operations under HEB.

"We need to use the new ideas that have been generated. There is a lot that FRAP has been developing in terms of new management systems, through GIS (Geographic Information Systems), habitat planning, partnership building and demonstration watersheds that may point the way for the future."

Griggs sees designing the new branch as an opportunity to introduce creative and innovative ways to protect and restore habitat and improve fish production. For instance, there is an opportunity to apply SEP's expertise in community involvement to working with volunteers, municipalities and industry as partners in habitat protection, monitoring and restoration.

And the need for new ways of doing business is urgent, he points out.

"We are faced with a constantly expanding population in B.C. We have got to stop the loss of habitat. We have got to bring on partners - municipalities, the province - to help us. We cannot do it alone."

The focus of hatchery staff, as another example, could be broadened beyond just fish production to include stock assessment and habitat protection. As well, habitat management biologists could take on

# HANCEMENT BRANCH

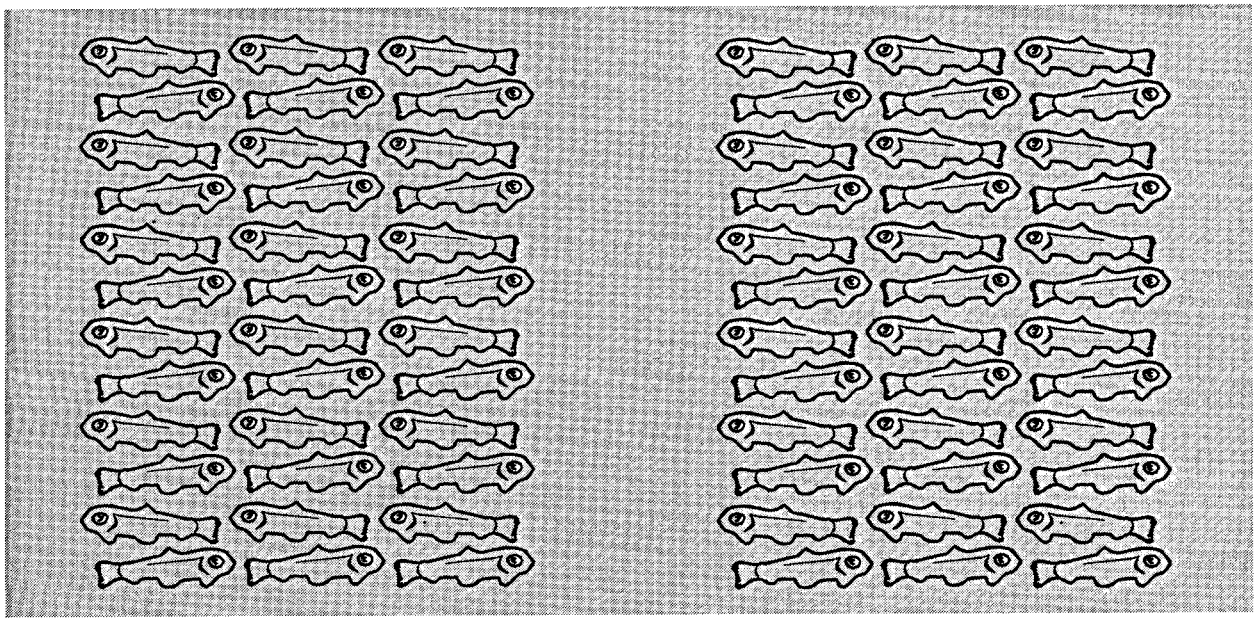
more of a planning and advisory role if freed from the heavy referral and regulatory workload, he says. These are just some of the ideas that will be tossed around in the next several months.

To test new ideas, Griggs is a fan of piloting a proposal in a couple of sites to see how it works. After several months, the "experiment" can be evaluated, and if successful, adjusted and applied across the region.

Griggs acknowledges that communication and cooperation between Habitat Management and SEP have not always worked well. There have sometimes been clashes between the two groups over SEP enhancement work, which HM felt should be treated as any other work impacting the river and its habitat.

"There's been conflict in the past," Griggs says. "Habitat people have got to think in terms of fish production. SEP people have to follow the rules like everyone else. There must be mutual education in which one side teaches the other about their values. I think we can achieve a real new energy and synergy in this merger."

*– Carrie Mishima*



New ways of doing business are encouraged in the HEB. The following are some proposed changes:

- Expand the role of SEP hatchery staff and community advisors to include responsibility for stock assessment and habitat monitoring and protection. This would increase departmental presence in habitat protection.
- Apply ideas and products generated by the Fraser River Action Plan and Habitat Action Plan to ongoing activities.
- Test new ideas in pilot studies in selected areas of the region, evaluate the results and, if successful, apply to other areas.
- Reduce the regulatory workload and emphasis on referrals. Investigate the concept of using certified habitat biologists in the private sector to assess projects.
- Develop new partnerships with other government agencies, Aboriginal groups, industry, interest groups and volunteers. Streamline and harmonize federal, provincial and municipal programs in habitat protection and restoration.
- Emphasize prevention rather than cure in habitat protection, with the use of guidelines, monitoring, habitat audits and by giving municipalities more regulatory powers.
- Design and implement a new integrated fish-production planning approach (both natural and enhanced production) organized on a watershed basis.

# STOCK ASSESSMENT DIVISION RISES TO THE CHALLENGE

Members of the new Stock Assessment Division have a busy summer ahead of them as DFO responds to the recommendations of the Fraser River Sockeye Public Review Board. About 50 per cent of the 35 board recommendations fall within the mandate of the Science Branch, and most of these come under the category of stock assessment.

The goal is to provide reliable, accurate and timely stock assessment advice to fishery managers. Many of the activities that will be undertaken this year with respect to the Fraser River salmon fisheries reflect an attempt by DFO to correct the shortfalls identified by the Fraser Review Board.

The key to successfully meeting these goals is a tight link between the individuals doing the stock assessments, fishery managers and the Pacific Salmon Commission.

"Our biggest challenge is making sure that those of us in the Stock Assessment Division clearly understand what information the managers need," says Mike Henderson, head of the new division. "It is absolutely essential that the people doing stock assessment work closely with those managing the fishery "

This year's activities will be focused in several areas:

### JOHNSTONE STRAIT

DFO will implement a cooperative program with the Pacific Salmon Commission to develop new methods of assessing in-season fish abundance in Johnstone Strait. A new seine test fishery will be developed in southern Johnstone Strait (Area 13) to obtain better estimates of salmon abundance, migration timing, stock composition and northern diversion rates for sockeye and pink salmon passing through Johnstone Strait en route to the Fraser River. Catch data from this test fishery will provide new information about the escapement of Fraser River salmon through the intense fisheries in upper Johnstone Strait.

New hydroacoustic surveys will be conducted simultaneously with the Area 13 test fishery to determine the effectiveness of hydroacoustics as a tool for assessing salmon abundance in the strait. The surveys will use experimental equipment developed by Jim Galloway of the Sonar Systems group at the Institute of Ocean Sciences.

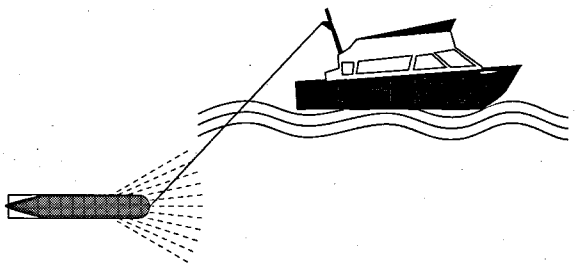
Recognizing the need to improve the accuracy and timeliness of in-season catch information, Brent Hargreaves and Lorne Collicutt will be coordinating a new pilot program to obtain catch data on a real-time basis. DFO will install portable computers, satellite transmitters and GPS vessel positioning receivers on 16 DFO charter patrol vessels, test fishery seine and commercial gillnet vessels. Vessel masters will be able to easily input catch data after each set which will then be transmitted, along with information as to vessel identity and position, to DFO offices in Vancouver, Campbell River and Nanaimo. Ultimately, it is hoped that use of this technology will be extended to include all commercial fishing vessels operating in B.C. waters.

Efforts are also underway to examine the relationship between ocean conditions, run timing and diversion rate. Using Pacific-wide ocean temperature maps, Howard Freeland and Skip McKinnell of Science Branch's newly formed Ocean Science and Productivity Division will investigate interesting relationships which reinforce the idea that the salmon are being influenced by processes taking place on a very large scale. "This should allow us to establish a relationship between the diversion rate and sea surface temperatures (SST's) measured at offshore buoys," says Freeland.

### FRASER RIVER

Work underway in the Fraser River reflects a new spirit of cooperation and teamwork between the Pacific Salmon Commission and DFO, acknowledging that cooperation is essential to come up with the best scientific information possible. Stock Assessment's Al Cass is working full time with commission staff from April to September to improve communication and understanding of in-season run and stock size estimates. In previous years, DFO staff didn't really know how to interpret the PSC's numbers because they were not involved in the analysis.

In a new project, Tim Mulligan is working with PSC staff to test some of the assumptions in the methodology currently used by the commission to estimate salmon escapements at Mission. This is in response to a recommendation made by the Mission Hydroacoustic Working Group which concluded that work was needed to validate and improve the methodology used by the PSC at its Mission hydroacoustic facility. A split-beam hydroacoustic system, similar to the one already in use at Qualark Creek further upriver will be installed at Mission in 1995 to provide independent escapement estimates.



Other hydroacoustic work underway under the leadership of David Farmer from IOS includes testing of forward-scattering "scintillation" hydroacoustics and rapid scan imaging sonar at Mission to determine whether this technology can be used for counting salmon.

The Qualark Creek hydroacoustic installation will enter its final "calibration," year but will also be used to generate some escapement estimates.

Enroute mortality in the Fraser River was a major problem in 1994. To address this the river temperature computer model developed by Mike Foreman to forecast water temperatures in the Fraser River will be expanded to allow forecasting of temperatures in the Stuart/Nechako and Adams River tributaries as well as the Fraser during the fishing season.

The program for monitoring water temperatures in the Fraser will be expanded. In 1994, the data recorded by temperature probes located throughout the Fraser was not available until the end of the fishing season. This year, at least two monitoring stations will be linked by satellite to Vancouver and will provide "real-time" monitoring of river conditions. Changes in environmental conditions will be tracked by the hour providing crucial information for fishery managers.

A multi-disciplinary scientific team headed by Ian Williams will develop criteria to identify extreme environmental factors in the Fraser River and its tributaries which could potentially affect salmon migration, survival or reproductive success. They will also gather detailed physiological data so that more precise estimates of environmental limits of tolerance can be determined.

### CATCH ESTIMATION IN THE FRASER

Monitoring of Aboriginal catches of sockeye will be concentrated in the Fraser River canyon from Sawmill Creek to Kelly Creek. This was the area of greatest uncertainty last year. The objective of this team effort, involving C&P staff as well as Stock Assessment's Vic Palermo, is to provide defensible and reliable catch estimates. In addition, more effort will be directed towards monitoring of sockeye and pink salmon catch in the recreational fishery near Chilliwack.

*– Kelly Francis*

# SELECTIVE HARVESTING FOCUS OF SKEENA WORKSHOP

Selective harvesting as the best means to protect weak stocks was the focus of a workshop held in Prince Rupert in late April.

Attended by about 80 participants and organized by the Skeena Watershed Committee, the workshop provided a forum for presentations and discussions on a wide range of topics relevant to the selective harvesting of Skeena salmon stocks.

Workshop chair John Brockley of the Sportfish Advisory Board highlighted partnership and cooperation as the key themes of the workshop. "The move from a era of conflict to coexistence and partnership is empowering stakeholders to work through the complex issues of resource management in the fisheries," said Brockley. He added that the end result would be better conservation, enhanced access for stakeholders and the creation of new economic opportunities.

The workshop—the second in a series of three organized by the watershed committee - brought together representatives from all three sectors as well as federal and provincial scientists and biologists. Together, participants provided a variety of perspectives on selective harvesting in traditional and current fisheries.

Topics addressed included:

- historical and current status of Skeena salmon and steelhead stocks
- harvesting surplus stocks
- physiology and product quality of in-river caught fish
- selective harvesting in the recreational and commercial salmon fisheries
- pre-contact and post-contact Aboriginal selective harvesting practices
- use of fishwheels for management and selective harvest of salmon on the Skeena and Nass rivers
- Annette Island trap operations
- fence harvests on the Skeena
- adapting commercial gear for selectivity
- the potential of current harvesting techniques to become more selective
- entrepreneurship and innovation in developing selective harvesting technologies

Discussion groups following presentations focused on selective harvesting strategies appropriate for the Skeena with an emphasis on sustainability. Discussions centred on:

- benefits associated with selective harvesting
- opportunities for selective harvesting in fresh and salt water
- issues related to catch and release fisheries for all sectors
- factors/objectives considered for selective harvesting proposals

The next workshop will focus on socio-economic issues in the Skeena watershed, and will be held in the fall of 1995.

# LOCAL HERO

Dave Looy was planning on getting a little landscaping done at his home in Campbell River on a sunny April weekend. As he recalls it, a gusty wind was blowing from the north, rippling through the trees.

As the off-duty fishery officer proceeded with some badly needed pruning, the calm of the quiet Sunday morning was suddenly shattered with calls of distress. The cries were coming from nearby Discovery Passage just off Willow Point, where he could just make out an overturned kayak bobbing in the waves.

Gardening plans brought to an abrupt halt, Looy sprang to action. As luck would have it, he had moved his small aluminum boat to the front yard the year before. He quickly dragged the boat across the yard and onto the shore. At the same time he yelled to his wife to call the RCMP.

"I could see that of the two people in the water, only one was wearing a life jacket, and there must have been a 21-inch swell in the ocean," said Looy, who has worked in the General Investigation Unit since its inception in 1986. He quickly set about getting his skiff into the frigid waters, hauling the boat across the rocky beach and low tide rocks to the water's edge and rowing to the rescue of two local youths.

The two 14-year-olds were taken by ambulance to hospital, where they were treated for hypothermia and later released.

The RCMP, who assisted in the rescue, commended Looy for his swift and decisive actions which averted a near tragedy from occurring.

It's not the first time Looy has engaged in off-duty rescue work. There was the time in Merritt 14 years ago when he and his wife were fly fishing.

"We could see a commotion in the water a fair distance from us where an elderly man had fallen from his boat," Looy recalls. "We sped our boat over and managed to retrieve him - with some difficulty I might add - given that he was well over 200 pounds."

Modestly adding that his efforts were nothing extraordinary - "I was in the right place at the right time -" he acknowledges that the undercover work he does has probably ingrained in him a sense of being alert at all times.

"You probably develop a sixth sense, or a nose for trouble," notes Looy, who in the course of his work has hidden out in dumpsters, disguised himself as a duck hunter and pushed rusty shopping carts through back alleys during sting operations.

A self-described "low-key, low-profile kind of guy," Looy credits teamwork as the essential component to executing a successful mission, be it rescuing drowning kayakers with the RCMP, or nabbing criminals as part of a major investigation. "Working together with a common goal is a key lesson I've learned during my years with the GIS. Everybody's effort as part of a team pays off in the end."

# PERSONNEL UPDATE

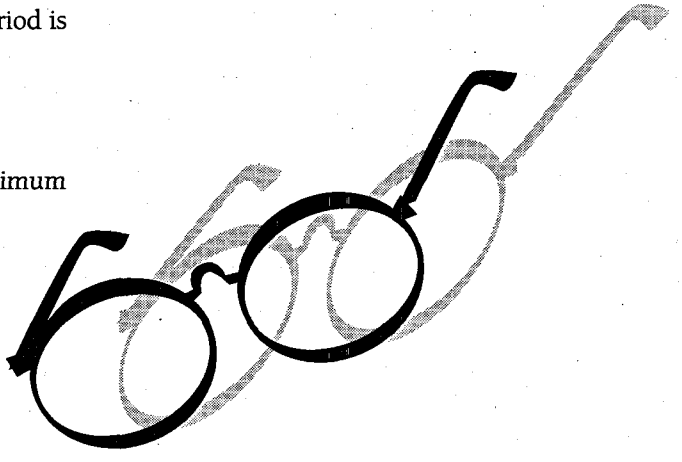
To simplify the administration of the vision care benefit under the Public Service Health Care Plan, all participants have the same two-year period during which they can be reimbursed for the purchase of eyeglasses/ and or contact lenses. The current two-year period is from Jan. 1, 1995 to Dec. 31, 1996

Example of claim for eyeglasses

Eyeglasses and/or contact lenses have a maximum eligible expense of $200 in a two-year period.

| | |
|---|---|
| Cost of glasses | $250 |
| eligible expense | $200 |
| less deductible | $25 |
| eligible for reimbursement | $175 |
| reimbursement at 80 % | $140 |
| co-insurance | $20 |

Summary: for this pair of $250 glasses, your share would be $110 ($50 + $25 + $35). The plan would reimburse you $140.



# MAKING A DIFFERENCE

More than 300 volunteers, community group representatives and educators from across the Pacific Northwest took part in Workshop '95 May 19 to 21 in Williams Lake.

Workshop '95 is one of a series of volunteer-hosted symposiums intended to recognize and celebrate the volunteers and communities involved in salmonid enhancement activities throughout B.C. and the Yukon. DFO, through SEP, provides support, training and hands-on assistance to more than 200 volunteer groups. In addition to salmonid enhancement, many groups are involved in habitat restoration, research and watershed stewardship projects on more than 200 streams.

The conference was hosted by three volunteer groups from northern B.C. - the Central Coast Fisherman's Protective Association (Bella Coola), Spruce City Wildlife Association (Prince George) and the Toboggan Creek Enhancement Society (Smithers).

Louis Tousignant, DFO's Regional Director General, officially launched the Streamkeepers Program, a community-based salmon conservation initiative now up and running. Workshop '95 was also dedicated to John Davis, Executive Director of the Pacific Salmon Foundation, who died May 6. Two trees were planted in his honor by children at a ceremony at the Chimney Lake demonstration site.

Participants heard from a number of presenters, including Lee Dutta, a civil engineer with DFO's Habitat Management Unit, who spoke on tripartite fish flow agreements, and Dr. Carl Walters of the U.B.C. Fisheries Centre. Delegates also participated in a number of seminars and hand-on workshops throughout the conference on subjects ranging from stream habitat surveys and water quality monitoring to DFO's Observe, Record, Report Program and diseases in hatchery salmonids.

The RDG presented several awards on behalf of volunteers and DFO staff. Bev Bowler, contract SEP coordinator for the Lower Mainland, received an award for her ongoing contribution to cultivating children's involvement in salmonid enhancement and protection. Lee Nikl, head of Habitat Management's Water Quality Section in the Fraser River Division was also recognized for his campaign to halt the use of chloramine in the Lower Mainland water system. And Roy Argue, community advisor for the Central Interior and Yukon, received a surprise 30th birthday greeting from Mr. Tousignant.

Volunteers were kept busy Sunday with a streamside restoration. Several acres of Chimney Creek were fenced in and planted with indigenous species which will provide shade and help stabilize the banks of the stream. Volunteers also developed the Chimney/Felker Lakes Heritage Trail, installing interpretive signs as well as two hand carved log benches for hikers. Other attendees participated in the Stream Survey Summary and the Gizmos to Go workshops, or a tour of the Scout Island Nature sanctuary.

But it wasn't all work and no play. Kids kept the adults entertained modelling salmon fry masks they had created and performing fish songs. And an evening of line dancing demonstrated that the RDG is more than just an able administrator.

Sandie MacLaurin, DFO community advisor for Cental Coast, deemed the event a tremendous success. "Our goal was to get people interested and involved in watershed stewardship. As well as having fun, volunteers were able to take new skills back to their communities." *– Karen Hansen, Fisheries Technician*

*Volunteers hard at work on the Chimney/Felker Lakes Heritage Trail.*

# NEW CIS PEER TEAM MEMBERS

The Critical Incident Stress Program provides support to DFO employees and their families following a workplace trauma or critical incident. The backbone of the program is the 21-member peer team comprising employees and employee spouses. Team members provide information to those experiencing critical incident stress and, when required, arrange for further assistance from Family Services.

New CIS peer team members pictured here are: **Left to right, back row:** Sandie Hollick-Kenyon (o. 666-2048, h. 984-2527), Nancy Seigel, Rob Wilkins (o. 666-4432, h. 590-2148) Don Potts (o. 363-6494, h. 479-6115), Don Hardy (o. 363-6475, h. 655-4820), Barry Huber (o. 561-5966, h. 967-4661). **Left to right, middle row:** David Heap (o. 627-3437, h. 627-4942), Mary Hobbs (o. 666-3861, h. 271-0223), James Boland (o. 666-2048, h. 986-7491), Marsha Lloyd (o. 638-2202, h. 635-5010), Darcy Miller (o. 338-7444, h. 338-9630), Valerie Huber (o. 565-2445, h. 967-4661), Ron Paziuk (o. 627-3445, h. 638-8370), Bruce Paterson (o. 363-6494, h. 337-8639), Steve Kelen (Family Services). **Left to right, front row:** Tom Hlavac (o. 949-9609, h. 974-2452), Inge Kassteen (o. 974-2452, h. 949-9060), Byril Kurtz (o. 832-3702, h. 832-3702), Greg Klimes (o. 754-0230, h. 758-0147), Lorayne Tritschler (o. 982-2214, h. 982-2222).

# TIDINGS

### NEW TO THE DEPARTMENT

**WARD, Jaci** - Field Admin Assistant, Operations Branch, Lillooet

### APPOINTMENTS & PROMOTIONS

**BEDRY, Brenda** - Safety and health administrative assistant, Personnel, RHQ

**BENKE, Anna** - Data Support Clerk, Aboriginal Fisheries, Operations Branch, RHQ

**FARRELL, Melody** - Urban Planner, Fraser River Action Plan, Operations Branch, RHQ

### RETIREMENTS

**COOK, Gerri** - Gerri retired from the Qualicum Hatchery May 16 after 19 years' service

**JOHNS, Garry** - Garry retired May 19 from the Marine Division, IOS, after 30 years' service

**KOPPEL, Albert** - Albert retired May 13 from Physical and Chemical Sciences, IOS, after 21 years' service

**MARATOS, R.** - April 1, from the Marine Division after 26 years' service

**SWAIN, J.E.** - April 1, from the Marine Division after 16 years' service

**WHEELER, M.G.** - April 1, after 35 years' service with the Marine Division

**ZITZEWITZ, JOHN** - John retired from the Marine Division April 14 after 30 years' service

The South Coast Division held a retirement dinner June 9 to bid fond farewells to the following staff: Bob Armstrong, Lyle Freeman, Barry Lawley, Bob Humphreys, Bob Hurst, Rob Newton, Kip Slater, Alvin Sewid.

A retirement lunch will be held June 27 for Dave Schutz and Ed Zyblut at the Pink Pearl Restaurant, 1132 East Hastings Street, Vancouver. To confirm, please call Frances Dickson at 666-6509, or Alexandra Reid, at 666-6464.

### BIRTHS

Annie Kara, Comptroller's Branch, is the proud mother of **Tasha-Aliya Kara**, born Friday, June 2, 1995, weighing in at 7lbs.

**Kevin Ian Tutty** was born April 21, 1995, weighing 8 lbs 14 oz. Dad Brian Tutty (Habitat biologist, South Coast Division), mom Kathryn and Katrina (age three) are all doing well in their reorganization.

THE SOUNDER

VOLUME XL • NUMBER TWO • AUGUST 1995

# FLEET RATIONALIZATION ON TRACK

Meetings will begin in September to forge a new face for the commercial salmon fishery on the West Coast.

The task of developing recommendations on commercial salmon harvesting reforms will be carried out over the fall by the Pacific Policy Roundtable, composed of commercial industry representatives. Roundtable participants will be working to a set of objectives established by DFO, based on conservation, industry viability and partnership. These recommendations for the future of the commercial salmon fishery will be forwarded to the Minister by the end of November. Implementation of industry reforms will start in 1996.

The reforms are not intended to provide a quick fix solution, says Al Wood, director of program planning who is serving as secretariat to the roundtable. However, fundamental changes are required to guide the management of the commercial salmon fishery over the next decade and beyond.

The need for an overhaul of fleet management stems from a number of critical problems with the current structure of the commercial salmon fleets. Over time, the catching power of the fleet has risen significantly as fishing gear and vessels have become more efficient. The current fleet capacity makes it difficult to meet escapement targets and control inci-

## IN THIS ISSUE

dental catch of weaker stocks. The risk associated with management decisions also increases with the growing capacity of the fleet. Managers have reduced fishing time significantly over the past decade, with the result that little management flexibility remains.

Another important consideration is the impact current fleet management has on effective enforcement. Shorter, crowded openings increase the pressure to fish intensively and offer little opportunity for industry cooperation. Increasingly complicated management plans reduce flexibility in enforcement planning.

Finally, large fleets increase management costs for the fishery. Information requirements increase with fleet size and capacity, while in-season management and enforcement needs also increase with large fleets. With government budgets declining, greater management flexibility and innovation are needed.

A workshop hosted by the Pacific Regional Council (PARC) and DFO was held at the end of April to reach agreement on defining these fundamental problems. Workshop participants also identified a number of management options and issues that require in-depth analysis and recommended that this analysis be provided to industry participants in advance of the first roundtable meeting.

A steering committee has been established to help direct DFO staff in the analysis of options and issues and to review material prior to broad circulation. Issues currently being analyzed by DFO staff are:

### Salmon Production Potential

- What is the full potential of the salmon resource?
- What is DFO's position on the future role of salmon enhancement, in particular the ability to produce more salmon and catch given concerns about weak stocks and biodiversity?

### Impact Analysis of Different Fleet Reduction Scenarios

- Assess the financial impact of various levels of fleet reduction (for example, within the 20 to 40 per cent range).
- Provide in-depth analysis of each fleet management option put forward by the workshop gear groups.
- Examine individual or enterprise quota management and compare to other options.

### Environmental/Habitat Issues

- Identify the impact of habitat damage on fish stocks and its influence on the potential to rebuild salmon stocks.
- Identify ways of maintaining fish habitat.

### Biodiversity

- What does biodiversity mean and how can it be maintained?

### 1994 Cost and Earnings Survey

- Conduct 1994 survey and have results available by September.

### Catch and Effort Data

- DFO to provide a list of what we need to improve catch and effort data.

### Government Costs

- Provide breakdown of total government costs to support commercial salmon fisheries including DFO expenditures, unemployment insurance benefits and provincial government activities.

### Historic Data

- Assemble historic data on catch by gear and area as well as trends in income and employment.

### Specific Fleet Management Options for Review

Suggestions for fleet management options requiring in-depth analysis were put forward by each gear panel. The research undertaken over the summer months will consider the impacts of every option on each fleet. For example, single gear licensing is an option of interest to the gillnet sector, but the analysis undertaken will consider impacts of this option for seiners, trollers and gillnetters.

### Other Action

The roundtable will have a tiered structure where the main table is supported by three gear panels. Roundtable meetings will be held in September, October and November. Scheduling will accommodate participation in fishery openings and allow time between each roundtable session for participants to seek additional input from industry.

The main table, whose proceedings will be facilitated by DFO's regional director general, will be tasked with the responsibility to formulate recommendations

*continued on page 11*

THE SOUNDER

THE SOUNDER IS THE STAFF NEWSLETTER OF FISHERIES AND OCEANS, PACIFIC REGION.

Your contributions are welcome. Please send story ideas, photos and letters to the editor.

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# FOCUS ON FISHERY OFFICERS

*By Su-Anne Yeo*

The work of DFO fishery officers is more important than ever due to widespread conservation concerns.

In the past, fishery officers worked in the areas of enforcement, fisheries management and habitat referrals, performing such diverse tasks as public relations, licensing and stream enumeration. They now focus on the enforcement of fisheries laws and regulations intended to conserve and protect the resource.

"The new approach to enforcement involves taking a field unit, attacking single issues and focusing on one priority at a time," explains Herb Redekopp, field supervisor for the Lower Mainland/Squamish Steveston Area office (Area 29).

In the Pacific Region, a top priority is salmon. This year, fishery officers in Area 29 have been working around the clock to enforce the sockeye closure on the Fraser River which was prompted by low abundance levels in the Early Stuart run. Their vigilance has paid off. "To date, we have been successful at deterring any poaching activity on the Fraser," says Redekopp.

Enforcement will remain a priority after the fishery opens. Under a Mandatory Landing Program (MLP), all fish that are harvested must be landed at designated sites and counted. Fishery officers will patrol the river to enforce these measures and ensure compliance with gear and licence requirements.

Although the enforcement task may seem onerous, Redekopp is confident that fishery officers have been given a mandate by the public. "All of the user groups and the general public are very pleased to see us on the grounds," he says. "If anything, people want more enforcement. They ask, 'How come I haven't seen you since last year?' or 'Why can't you come out and do this?' The problem is that there are too many situations which require enforcement attention."

In the Pacific Region, approximately 115 fishery officers oversee commercial, recreational and Aboriginal fishing activities covering thousands of square kilometres along the coast and in the major inland water systems. The Lower Mainland Area office alone is responsible for the municipalities of Richmond, White Rock, and Greater Vancouver, Squamish, Pemberton, Whistler and portions of Port Coquitlam and Burnaby.

Redekopp admits that the fishery for shellfish is a growing concern. The preponderance of fish processing plants and restaurants in Vancouver and Richmond is a challenge for fishery officers to stay on top of the illegal trade in abalone and spawn-on-kelp. However, fishery officers have had considerable success in apprehending violators of the shellfish resource.

Despite public support for their work, fishery officers assume a degree of risk when they venture into the field.

"You have to be constantly aware, especially when you're boarding boats," says Ann Bussell, a fishery officer at the Steveston Area office. "There are often sharp objects, such as knives, lying around, and violators can get angry."

While fishery officers routinely deal with often difficult situations, they nonetheless remain a dedicated group of individuals.

Says Bussell: "I am very interested in helping to protect the resource and I'm glad to have the opportunity to work in an area where I can make an impact."■

*Area 29 Fishery Officer Ann Bussell measuring a crab for legal size.*

# DAY PATROL ON THE FRASER RIVER

*Su-Anne Yeo, a co-op student with Communications Branch, joined Area 29 fishery officers Ann Bussell and Ken Green on a recent day patrol on the Fraser River.*

Outside, the sun beats down, but the inside of the boathouse is cool and dark. Ken checks the oil, and we fill up with gas. The patrol begins.

We start from Steveston Harbour and travel east until we approach a small marina. Ken slows down the Hurricane so that Ann can scan the boats to see if any fish have been landed illegally. Technically, a fishery officer can only search a vessel if fishing gear is visible on board. When Ann is satisfied no fish have been caught, we continue on our way.

The sun is right above our heads, and I am thankful when we pick up speed. We travel through Sea Reach, turn, and find ourselves in a narrow waterway, lined with rushes.

"Over there," says Ann, pointing, "is a place called Albion Box. It's a favorite spot for poachers."

Ken lowers a measuring stick into the water to gauge the depth of the waterway. The water is just deep enough to travel through. When fishery officers patrol this passage at night, they need to know exactly how much room they have to manoeuver.

All around are trees and marshland. Swallows dart and dive. A blue heron rises from the marsh, and we watch it wing its way across the water.

"I love this part of the job," says Ann. "It's hard to be out here and have to get back to the office and down to paperwork."

We move on. When we reach the Ladner Slough, Ken and Ann make note of a dredging operation at the water's edge. They will call the owner later to confirm that he has a permit. Travelling back down Woodward Reach, we see a group of boys fishing on some logs, their legs dangling in the water. Ann pulls alongside them, and Ken moves to the front of the boat to ask how they're doing.

*Have they caught anything yet?*

No.

*And do they have a licence to fish?*

No.

Ann advises them to put away their gear. "There's a hardware store just up the street," she says. "You're free to return as soon as you've picked up your licenses." A little reluctantly, the boys agree.

The sun is as strong as it was at the start as we head back to Steveston and the area office.

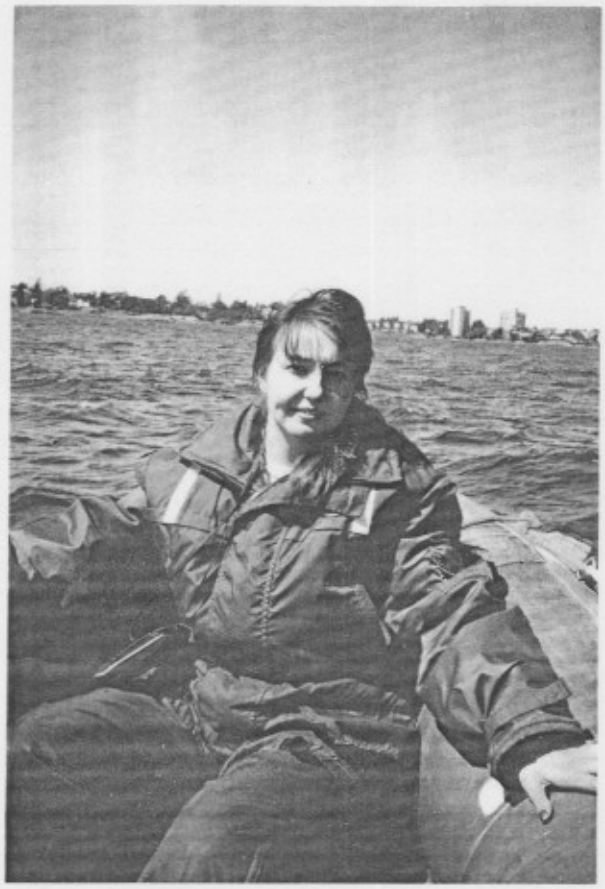
We race along, catching the wake of a few passing boats. A seal bobs up in front of us, then vanishes beneath the waves.

At Captain's Cove, on the way to Deas Slough, Ann suddenly notices a boat launch tucked away beneath some trees. We turn around to investigate. "This would be a good landing site for poachers," Ken explains, as we search around the launch. Tire tracks indicate the presence of a recent visitor. Ann makes note of the launch's location so they can check on the site at a later date.

We return to the area office, and Ann and Ken file their reports for the day. ■

ON THE WATERFRONT: *Fishery Officers Ann Bussell and Ken Green set off on a patrol of the Fraser.*

# TANU TRIP A WINNER



*Anna Benke on her excellent adventure.*

I had the great pleasure of holding the winning ticket for the "DFO Experience" draw of the 1994 United Way campaign. The prize was an exciting and educational trip for two on the TANU Fisheries Patrol Vessel.

The voyage began on Saturday morning, June 24, when I boarded the FPV TANU at the Cassiar Docks in North Vancouver along with my guest, Donna O'Brien. Donna is sister to former DFO employee Cindy O'Brien, who left Aboriginal Fisheries to pursue a high school teaching job in Swaziland, Africa in January of 1994.

We were welcomed aboard by Captain Paul Frost and Acting First Mate Dean Nelson. The ship is about 180 feet long and has 16 crew members. Tanu is a Haida name. There is a place on the south-east coast of Haida Gwaii (Queen Charlotte Islands) between Louise and Lyle Islands called Tanu Island. The island is named after Chief Tanu. The FPV TANU was named after this now abandoned Indian village.

Throughout the weekend we learned all about what happens on these Conservation and Protection, Monitoring and Enforcement Patrol Vessels. We were on a general patrol excursion, headed for a destination of Patricia Bay, where the TANU was scheduled to have a generator replaced. After a few hours we got our "sea-legs" and were able to fully enjoy the cruise, without the aid of Gravol. We were given a full tour of the vessel from the bridge to the engine room, and bow to stern. We were introduced to all of the crew, and shown how everything works. We learned that the ship is totally self-sufficient, like a miniature city. We were briefed on the various duties of the ship's crew, and even got to steer the vessel during manoeuvres measuring the nautical speed capabilities of the Tanu within a measured mile. The expedition took us around the south coast of Vancouver Island, and up the West Coast, past Victoria.

Saturday afternoon we jumped into big orange survival suits in preparation for a boat ride. We climbed over the side of the TANU onto a rigid hulled inflatable Zodiac motorboat. Our expert tour guide Jack Brown, acting bosun, took us on a thrilling tour which included the Victoria Inner Harbour, identifying various landmarks along the way. We kept in touch with the TANU via radio, and met up with the ship later that afternoon.

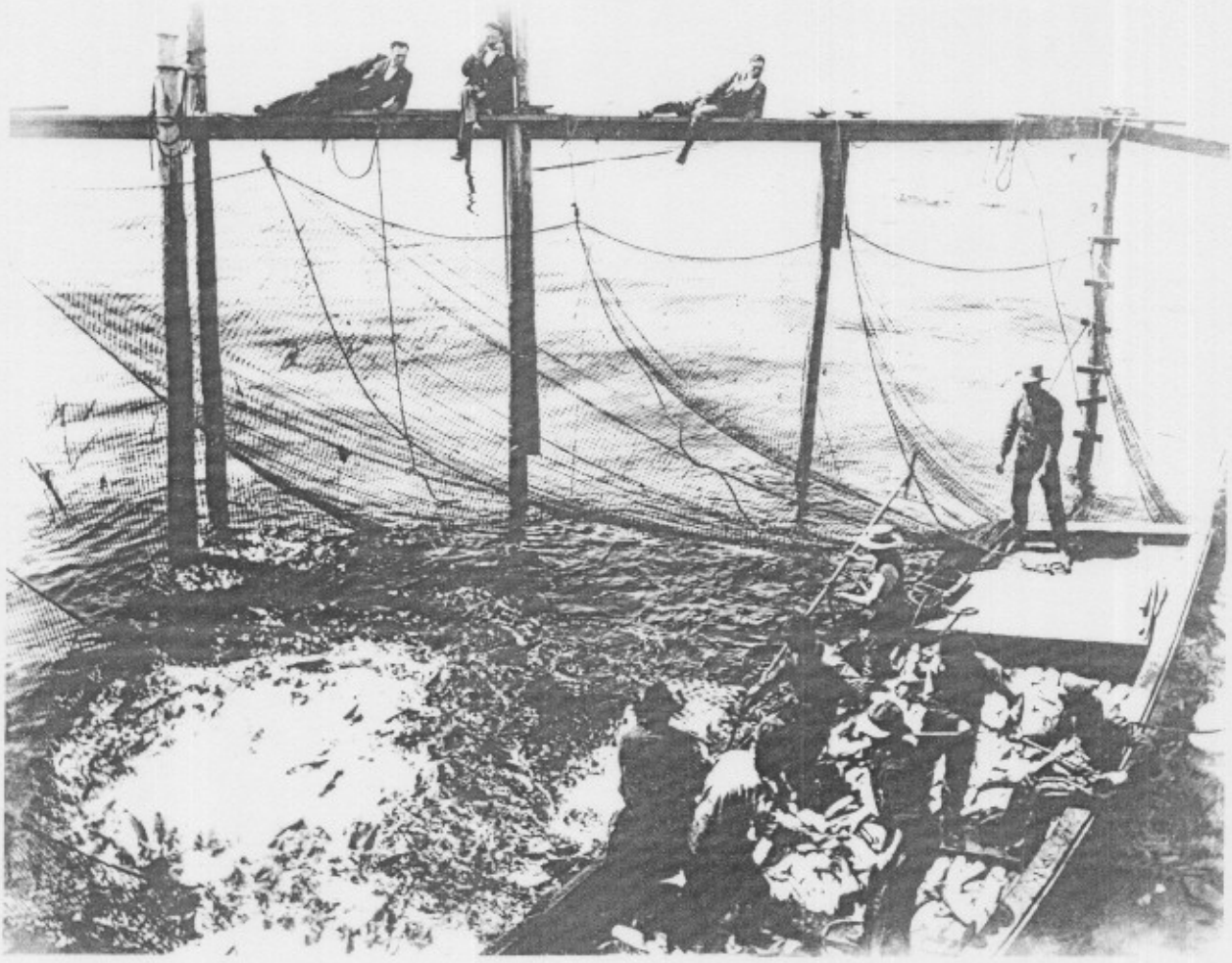
Evenings in the galley were filled with interesting conversations of past expeditions and adventures. Gourmet style meals were the order of the day. For lunch we were served a delicious fillet of sole with rice and steamed veggies. For supper there was a barbeque set-up on the aft deck, where we cooked up a choice of steak or chicken with all the trimmings. Our compliments go out to the talented chefs and stewards who do an excellent job.

The journey ended when the ship docked in Patricia Bay, Sidney, at the Institute of Ocean Sciences. Before we headed for the Schwartz Bay ferry to go home, we got a quick, but impressive tour of the JOHN P. TULLY research vessel which happened to be tied up beside us.

The trip left Donna and I with a better understanding of the important responsibilities and activities of DFO's Marine Division staff. We were very well cared for and educated by the delightful captain and crew of the TANU, and would like to thank everyone involved for making our "DFO Experience" so enjoyable and memorable. A special thanks also to Captain Gord Nelson, who made it all possible.

*– Anna Benke, Data Processor, Treaty Negotiations Unit, Aboriginal Fisheries Sector*

# T'SOUKE NATION, DFO DELVE HARVESTING



*A Sooke trap being lifted by means of brailing the catch into the trap skiff while observers look on. This picture was probably taken in 1905.*

Years ago a fisher's life was simple, and salmon could be caught with few worries. The level of gear efficiency, the relative abundance of most stocks and locally based fishing and management ensured most fisheries were sustainable. Now, 4,200 commercial salmon vessels and 400,000 sport fishers have a greater capacity to catch the stocks than the stocks have the resilience to withstand.

The need to be more selective in harvesting salmon has been abundantly clear for many years. Many large fisheries target on plentiful pinks, sockeye or chums while also over-harvesting chinook, coho and steelhead. New ways of cropping the surplus and allowing safe passage of weak stocks is required for a healthy resource.

In order to develop a suitable trap net for the Sooke area a partnership with DFO began February 10, 1995, with the signing of a multi-year Fisheries Agreement. This agreement sets up a working relationship between DFO and the T'Sou-ke Nation regarding various fisheries management issues. The major project focus of this agreement is the development of the trap net proposal.

Like other stakeholders, the T'Sou-ke Nation are concerned about the current low stock levels in local rivers. Two major impacts on local stocks over the years have been the Juan de Fuca net fishery and habitat degradation. The salmon habitat of the Sooke River is stabilizing and there are enhancement proposals for this system. This is encouraging but the mixed stock fishery at the mouth of the Juan de Fuca Strait continues to intercept the weaker non-target species.

The T'Sou-ke Nation's objective is to showcase the trap net as a selective harvest gear with the potential to be used as a stock assessment tool. When a trap has been operating in the same location at regular times it could be used to assess the relative strength of passing

*continued on page 10*

# NTO THE PAST FOR SELECTIVE TECHNIQUES

*Left to right: Jack Planes, Fred George, Gord Curry (DFO), Beverly Planes, Rob Brouwer (DFO), Frank Planes, Sandy Sprinkling, Jim Cooper, Dave Lightly, and Roy McGechaen (DFO), with the new Sooke trap net in the flume tank.*

In June a delegation from the T'Sou-ke Nation on Vancouver Island and DFO set off for St. John's, Newfoundland to test some fishing gear. It may seem a long way to go, but the lure was the province's Marine Institute at Memorial University, home to the largest flume tank in the world for testing fishing gear. This impressive institute was the site of a workshop facilitated by its knowledgeable and skilled staff to develop a new Sooke trap net.

The T'Sou-ke First Nation, in cooperation with DFO, is developing a tidal water trap net to help achieve selective fisheries. This trap net will be used to harvest salmon at a traditional site near Sooke by a modern evolution of an ancestral method. If successful, this new gear will harvest locally the salmon required by T'Sou-ke and other First Nations.

A scale model of a trap net was built based on the design of the old Sooke traps and European trap net designs to meet the conditions expected in Juan de Fuca Strait. The model was tested in ebb and flood current in the flume tank and modified by the T'Sou-ke fishers (with seine, gillnet and trap net experience), their biologist, DFO and Marine Institute staff.

The workshop also included lectures and discussions on trap nets used worldwide, designs, plans, trap-mammal interactions, fish behaviour near traps and a field trip to discuss this topic with the cod trap fishers of Newfoundland's Petty Harbour. Further on-site work at Sooke will be required to improve on the impressive model at the Marine Institute.

The next step is to bring two trap net fishers from Petty Harbour to Sooke with one of their traps. This trap would be modified through a training session for T'Sou-ke members followed by setting this gear in August at the site where their grandfathers once fished with a reef net.

The experience gained from the operation of a modified Petty Harbour trap net will assist in the further development of the new Sooke trap net. Through the winter, modifications will be made to the model for further testing in the flume tank. Detailed plans will be produced for the T'Sou-ke Nation providing for construction of the new Sooke trap net in time for the 1996 salmon season. ■

# CHARTING A NEW COURSE FOR CANADA'S OCEANS

A Canada Oceans Act will signal a renewal of Canada's leadership in oceans and marine resource management.

Introduced into the House of Commons June 14, the Act will reaffirm Canadian rights and responsibilities to ocean areas of our coasts and conserve and protect the oceans environment. The Act consists of three parts: a 200-mile Exclusive Economic Zone; an Oceans Management Strategy; and consolidation of oceans responsibilities.

### RECOGNIZING CANADA'S OCEANS JURISDICTIONS

Canada's jurisdiction over its ocean areas will be recognized through the declaration of an Exclusive Economic Zone and a Contiguous Zone. This is consistent with international law and practice.

The declaration of the EEZ, adjacent to Canada and extending out 200 nautical miles, will provide Canada with sovereign rights in this zone for the exploration and exploitation, conservation and management of living and non-living natural resources. The EEZ also provides Canada with the responsibility and jurisdiction to protect marine environment, regulate scientific research and control offshore installations and structures.

The establishment of a Contiguous Zone, which extends an additional 12 miles out from the outer edge of the 12-mile territorial sea, will permit Canada to take measures to prevent and punish the infringement within Canada of its customs, fiscal, immigration or sanitary laws or regulations.

### OCEANS MANAGEMENT STRATEGY

The implementation of the Oceans Management Strategy will provide the Minister of Fisheries and Oceans with the opportunity to develop, with stakeholders, a national strategy for Canada's Oceans. The strategy will give the Minister of Fisheries and Oceans the authority to enter into collaborative agreements and partnerships with interested persons and groups, other ministers, boards and agencies of the Government of Canada, provinces, environmentalists, universities, private industry and stakeholders. The strategy will ensure the conservation and protection of the ocean ecosystem and ensure it's resources are managed on an economically viable and ecologically sustainable basis.

The integrated management approach for the oceans means we will implement plans which will take into account conflicting interests of all users and regional disparity while ensuring the management of oceans activities in a more orderly fashion.

As an example, in the many users of the coastal area—aquaculturists, fishing industries, tourists, shipping—the integrated approach will ensure that the concerns and interests of all user groups are taken into account and ensure that one user is not jeopardizing the next.

### CONSOLIDATION OF FEDERAL RESPONSIBILITIES

The consolidation of most federal oceans responsibilities under one organization will establish an identifiable lead federal agency accountable for oceans management. This began with the recent merger of the Department of Fisheries and Oceans and the Canada Coast Guard.

It spells out the responsibilities endorsed by the CCG which include Search and Rescue, Marine Services and Environmental Management (pollution prevention). It also provides the authority to conduct marine science research such as fishery science, oceanography and hydrography. ■

# A Tribute to Arlene Biggs

*By Sandy Johnston and Gord Zealand*

On June 18, 1995, Arlene Biggs was tragically killed in a car accident on the Alaska Highway in Whitehorse as she was returning home from a day of golf, one of her favourite past times. Arlene, 43, leaves behind two children: Shannon, 18, and Shane, 16, and former husband Ray. For the past seven years, Arlene worked as served as the Budget and Administration Officer for the Yukon and Northern B.C. Division office.

Work-wise, you couldn't find a more organized person. Her office was always immaculate and it was a wonder how she could come into some of our offices without complaining or making some comment about the boxes, the piles of paper, the chest waders on the coat racks, the fish samples on the shelf—but she never did. She was too focused on getting whatever little bit of information she came in for.

Her work had to be done just right, and most of the time it was as close to perfection as it could be. This often meant finding her at the computer late at night, or on a sunny Sunday afternoon even though the beckoning of the golf course must have been overwhelming. Frequently, when she caught other employees working odd hours, she would comment "you've got to look after your kids and you can't do it here, so get out of here!"

Her high standards and goal of excellence resulted in an enormous output at work, including the provision of administrative assistance for all sectors in Whitehorse—the area manager, Conservation and Protection, Fisheries Management, Stock Assessment, Habitat, AFS and Aboriginal Claims. She was highly respected by co-workers and superiors alike. Testimony to this was a Deputy Ministers Commendation Award she received in 1993 in recognition of her outstanding initiative, dedication and quality of work. But no one had a higher respect and gratitude for her efforts than those who worked closest with her; we knew about all the extras. Other colleagues who knew about the extras must have lived in fear of Arlene's standard becoming theirs.

Arlene was a professional; everything was done to perfection and then some. She was always trying to improve whether it was at work, home or play. Her biggest strengths were in her compassion and love for people, with her children and family in the forefront. She constantly talked about her family and her concerns, hopes and love for them and preached "take time for your kids, they are the most important."

Arlene had a special relationship with each DFO employee in the Whitehorse office; many found her to be a person you could trust, confide in, depend on, joke with (as long as bugs weren't involved), go for a coffee and have her buy. Arlene helped many of us through times of personal crisis; knew when to listen and when to question. She was the person you broke the news to, both the good and the bad, and was a perpetual and comforting buffer between concerned spouses/friends and employees often having to give positive answers for many questions that had none or were unknown—"why hadn't someone phoned home... why was so-and-so late... where's my cheque?!"

Arlene shared and participated in many milestones of our lives; both the triumphs and the tragedies—the births of our children and the deaths and illnesses of family members or close friends. She especially liked the babies and would sit them by her desk and sparkle at them for a minute or an hour while the mom/dad ran an errand. She was one of the best customers in town for kid-size, oak rocking chairs and other presents for new-borns. For the toddlers, there was always a trip to the back for a special treat—a cookie, a chocolate bar—a particularly messy one that she knew would have a slight, but noticeable impact on the car seat upholstery! She was always encouraging people to go golfing, try karate, biking, or go for a walk. She praised the feeblest of efforts and usually topped them off by saying "you were really good, I wish I was that good."

Arlene will be remembered, and sincerely missed as a colleague and friend who was full of compassion, caring, and love and had a zest for life, and at the same time, was fully dedicated to her work. She was gentle and soft, but hard when there was a need to be; there was no pretentiousness about her and she relished the small things in life that came from the heart—a card, a thankyou, a look of appreciation.

For those who are interested, the Arlene Biggs Memorial Golf Fund was established in her memory to support youths by way of a golf scholarship. Donations can be made in the name of the fund and sent: c/o Gord Zealand, DFO, 200 Range Road, Whitehorse, Yukon, Y1A 3V1. ■

*continued from page 6*

salmon. The trap net could also be used for sampling and tagging programs.

The fundamental importance of the trap net developed by the T'Sou-ke Nation is its ability to catch and hold salmon alive. Target species can be harvested as required in peak condition while other species are enumerated and released. There is also great potential for stock assessment and tagging studies.

Various forms of this gear type were used for many years on the West Coast. The T'Sou-ke Nation and other southern Vancouver Island Aboriginal people traditionally used a "SX̱OLE" (reef net) to harvest salmon passing through their area. These Coast Salish peoples used the reef net to access the abundant Fraser River salmon which swam right past their villages.

These reef nets could be set in deep or shallow waters. The salmon were guided by a funnel shaped "lead" which piloted them into an awaiting net suspended between two canoes. The school was observed entering the net by an observer perched on a tower mounted on one of the canoes. On the word from the observer the net was closed, hauled up and the fish dumped into the canoes.

The lead was made of cedar bark rope with dune grass placed in the twinning to imitate the ocean bottom. The net was made from willow bark or nettles, the floats from cedar logs and the whole apparatus was held in place by rock anchors. An innovative variation for shallow waters was the manicuring of bull kelp to form a natural lead. This gear was not permitted to be used after the early 1930s in Canadian waters but American Aboriginal people in Puget Sound and Juan de Fuca Strait are believed to be still using this gear type today.

Commercial trap nets were used near Sooke from 1904 until 1958 to harvest and tag migrating salmon. A trap net is a stationary structure which has netting extending from the water's surface to the ocean floor. The "lead" is a barrier to salmon migration which directs the salmon into the trap which then guides the salmon through successively smaller openings until they are confined live in the "spiller."

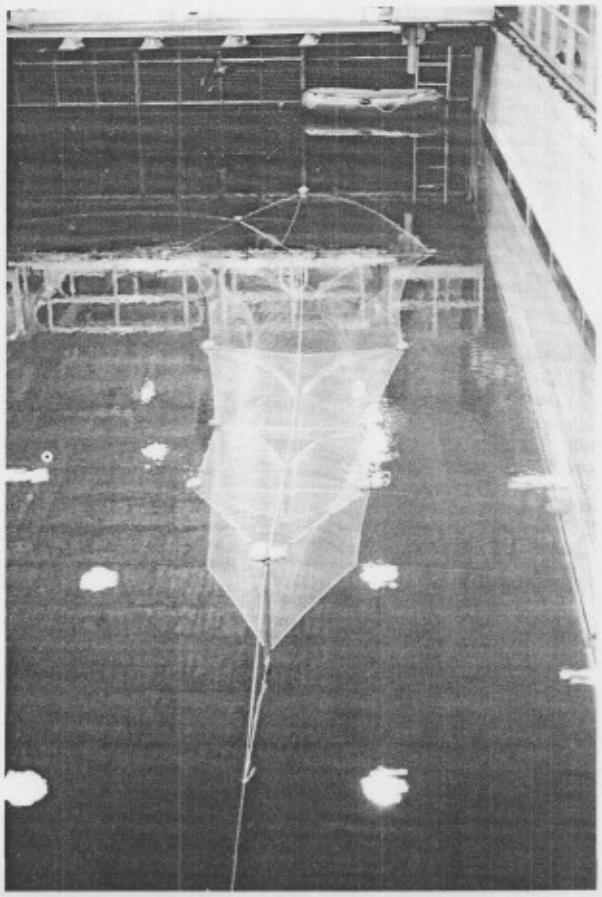
The Sooke traps were massive structures built from hundreds of log pilings up to 165 feet long. These piles were driven into the ocean bottom in the spring and removed every fall. Wire mesh attached to the pilings formed the lead, the longest being 2,400 feet from the shore to the trap.

The actual trap portion of the structure was made of tarred mesh suspended from the piles. When it was time to harvest the catch this flexible mesh of the spiller was pulled by hand into a trap skiff. The salmon would become crowded allowing the fishers to remove the catch with a large dipnet (brailer). A few times per week the salmon were brailed straight into a packing vessel's hold.

These traps (an average of five operating per year) were a constant source of controversy, with many other sectors of the fishing industry claiming they were responsible for the decimation of salmon stocks.

This question was examined on numerous occasions, the most recent during the Sloan Commission of 1940. Judge Sloan concluded that the Sooke traps had consistently taken less than six per cent of the total catch of Fraser sockeye. He also stated that these traps were no more responsible for the salmon decline than any other gear type. He ruled that the traps were an important base for the economy of Sooke and they should continue fishing. They did so until 1958, when restricted fishing times, increased competition from mobile gear and forecasts of poor future runs made it no longer economical to operate this gear.

The T'Sou-ke people's goal is to re-establish a trap fishery at their traditional site. They presently meet most of their salmon requirements by hiring a seine boat in combination with other bands. This is done away from the T'Sou-ke territory, does not involve band members and often produces a glut of fish difficult to process domestically. The trap would have the merit of being a modern development of a traditional method operated locally by band members and providing fish as they are needed. – *Gord Curry, AFS Program Officer, South Coast. Anyone who would like further information on the Sooke trap can call Gord at 756-7255.*



*Sooke trap net in the flume tank at a .5 knot current.*

# PBS SCIENTIST HONOURED

A long and notable career in fisheries science was recognized recently with the award of the Professional Institute of the Public Service of Canada Gold Medal and the American Society of Parasitologists' Distinguished Service Award to Dr. Leo Margolis. Dr. Margolis is a Senior Scientist at the Pacific Biological Station.


*Bert Crossman, left, President of the Professional Institute of the Public Service of Canada presents the 1995 Gold Medal Award to Dr. Leo Margolis for his outstanding contributions to Canadian science.*

Dr. Margolis' career at PBS has spanned a period of some 43 years. An outstanding, internationally acclaimed scientist, he is Canada's foremost fisheries parasitologist. The results of his research into parasites and diseases of cultured freshwater and marine fishes have been published in at least 128 primary scientific papers which have appeared in numerous journals and countries as well as a number of technical reports, book chapters and review articles.

He is perhaps best known for his research into the use of parasites as biological tags. Early in his career, he developed a method of distinguishing between North American and Asian sockeye salmon stocks using parasites. This research led to the development of international agreements regulating the fishing of these stocks in the North Pacific. The use of parasite assemblages to determine the rivers of origin of migrating sockeye smolts contributed to current knowledge of sockeye migration.

Some of Dr. Margolis' most important contributions to Canada come from his work in international fisheries and trade negotiations. He worked closely with the International North Pacific Fisheries Commission for more than 30 years, first as a scientific advisor and laterally as the senior scientist in the Canadian delegation. He is currently the senior Canadian advisor to INPFC's replacement, the North Pacific Anadromous Fisheries Commission.

He played a key role in the development and implementation of United Nation resolutions that eventually led to the moratorium on high seas driftnet fishing. His involvement in lengthy negotiations to open up non-tariff barriers on the import of Canadian salmon to Australia and New Zealand led, in part, to a recent decision on the part of those countries to relax these import restrictions. This will result in the creation of an export market worth several million dollars a year to Canadian salmon processors.

Dr. Margolis has received many awards and accolades throughout his career. He is a Fellow of the Royal Society of Canada and an Officer of the Order of Canada, to name a few of the honors bestowed upon him during his career.

He is highly respected and admired by his peers, and a valuable mentor to the many graduate students and budding scientists he has guided and influenced in his capacity as Adjunct Professor at Simon Fraser University.

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*Pacific Roundtable: continued from page 2*

to the minister.

It was agreed that fleet management reforms would not be designed for the 1996 salmon season only but will be based on a 10-year management planning horizon, encompassing more than two cycles.

Other issues that are being developed over the summer for consideration at the fall roundtable meetings include:

- increases in commercial salmon licence fees that will be implemented in 1996
- corporate concentration in licence holdings
- possible institutional changes such as a Licensing, Allocation and Sanctions Board and a Resource Conservation Council

For licence fee increases in 1996, plans will be developed with other user groups such as recreational and groundfish for implementation in 1996. Workshop participants have agreed that for commercial salmon licences, the increases that will come into effect in 1996 must take into account the reforms that will be recommended through the Pacific Policy Roundtable process. ■

# TIDINGS

### LEFT THE DEPARTMENT

**FINNIGAN,** Rheal (Ray) – Ray retired from SEP after 26 years' service.

**MOORE,** J. Al. – Retired from SEP after 27 years' service.

**NEWTON,** Robert – Retired from Operations Branch, Nanaimo, after 19 years' service.

**PITRE,** Ken R. – Ken retired from SEP after 29 years' service.

**SCHUTZ,** Dave – Dave retired from Operations Branch after 26 years' service. See Dave "thanks."

**TAYLOR,** Nick – Nick retired from Management Service Branch after 27 years' service with the government.

**ZYBLUT,** Ed – Ed retired from Operations Branch after 25 years' service

*Staff at RHQ turned out en masse to wish Pam McNally, everyone's favorite executive assistant, a happy 50th birthday July 18. The birthday extravaganza—spearheaded by Kathleen Vincent from the RDG's office—included an office renovation (balloons and flowers galore) capped off by a cake cutting ceremony in the big boardroom. In Pam's words, the day was a memorable one. Here she is, flanked by husband John McNally.*

*The following have retired from the Pacific Biological Station and West Vancouver Lab:*

**FALKNER,** Ward; **SMITH,** Tom; **AUBRY,** Patrice; **ROSS,** William (25 years' service).

*From IOS:*

**DEMERIEZ,** Shirley (Hydrography) and **HOLMAN,** Ken (Hydrography) after 33 years' service.

### BIRTHS

To Lydia (Management Services) and Bill (Communications) Morrell, a daughter, Rachel, June 20 at 1:20 p.m. weighing 1 lb. 10 oz. Bill and Lydia would like to thank everyone in DFO for their support and interest, and staff at B.C. Women's Hospital and Children's Hospital for the excellent care they are providing to Rachel. The latest addition to the Morrell family continues to thrive and with continued good fortune should be home from hospital mid-August.

## *DAVE'S FAREWELL*

*Good-bye my friends:*

After working 26 years to the day for DFO, and on June 27, Ed Zyblut and I were given a fabulous farewell with about a hundred of you attending. Many others contributed to the cards and gifts, and I am taking this opportunity to thank you all.

One of the best things about working for DFO is the people. The department seems to attract a special breed of employees, and I will miss you dearly. However, you have given me wonderful memories that I will never forget. I wish you well.

*Sincerely, Dave Schutz.*

# THE SOUNDER

VOLUME XL • NUMBER TWO • OCTOBER 1995




***In March 1995 DFO announced a five-point plan in response to recommendations by the Fraser River Sockeye Public Review Board. The following four stories profile some of the departmental activities that took place over the 1995 season.***

# CREEL SURVEY CAPTURES VITAL DATA

Fresh water salmon anglers are doing better than ever on the Fraser River. That's the word from the Department of Fisheries and Oceans early season creel survey.

During June and July, more than 5,500 chinook were caught by anglers fishing the Fraser River downstream from Hope.

While August showed a downturn in the number of anglers on the river each day—an average of 141 compared to a daily average of 277 during July—there were a number of reasons for this. June and July saw the dedicated chinook fishers on the river, not always the same people who are out in August and September after sockeye and chum salmon.

When John Fraser completed his investigation of the salmon decline last year he made a number of remedial recommendations. One of those recommendations was that DFO should maintain accurate statistics on all fisheries catching Fraser River salmon runs.

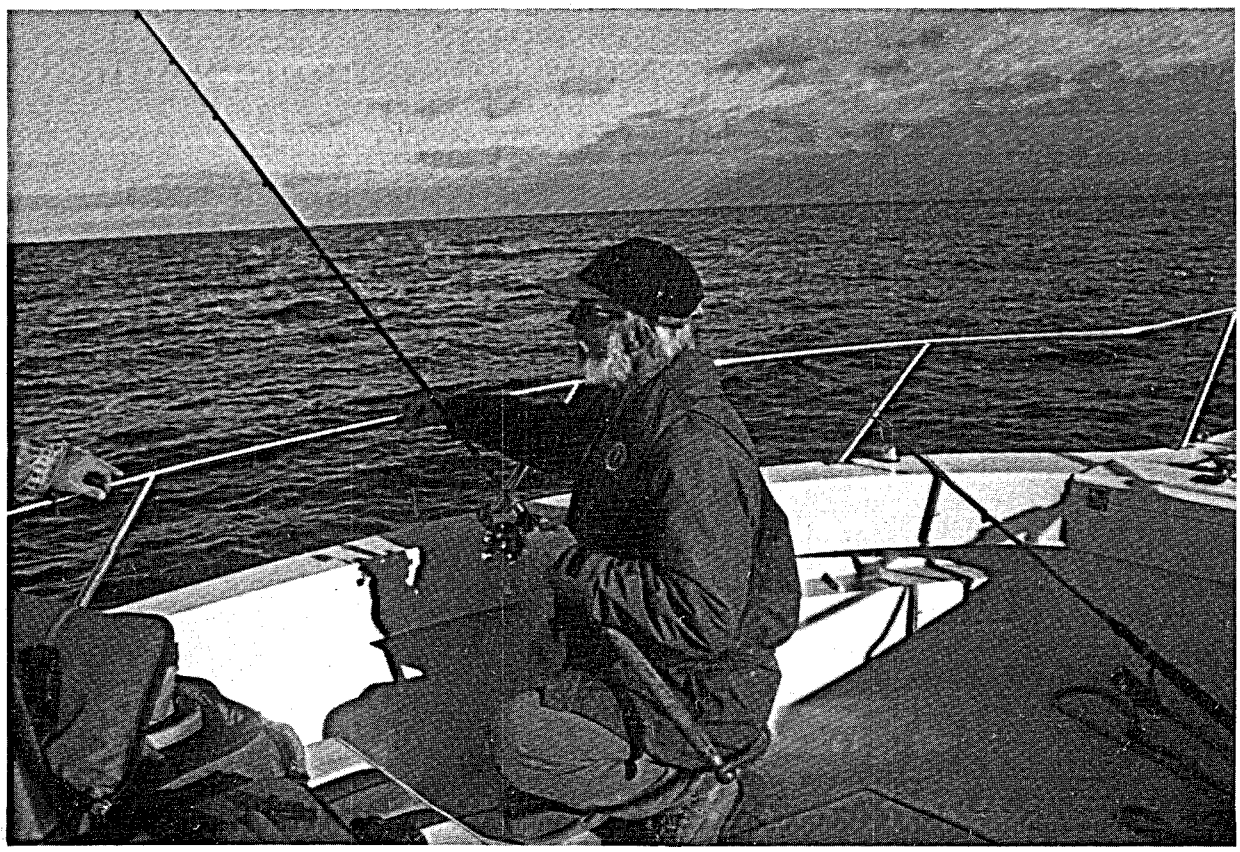
One benefit of the Fraser recommendation was DFO returned to the creel survey they abandoned in 1990. With a gap of some five years much crucial information is missing.

While DFO has no figures on how anglers did in their first year fishing sockeye they will have hard data this fall. What is apparent from the preliminary figures for this year is the dramatic increase in anglers on the river in June and July 1995 compared with 1989 and 1990, the last years that figures are available for part of the river. A shift is also noticeable in where the people are fishing.

"There appears to have been a significant increase in effort in the area from the Sumas River to the Harrison River, both on weekends and Mondays," says Jim Irvine, the research scientist at the Pacific Biological Station responsible for the creel survey.

June saw the fishery start slowly with an average of some 140 anglers per day on the river, up some 26 per cent from 1989. But in July the numbers fishing between the Sumas and Harrison jumped 100 per cent between 1990 and 1995 with an average of 103 rods per day going to 206 on weekends and 50 to

## IN THIS ISSUE



146 on weekdays.

On the section of the Fraser between Harrison River and the Agassiz Bridge the increase in effort was even more dramatic with 1990 averaging only nine anglers on weekends. This went to 77 per day this year, with seven on weekdays going to 43 this July.

Jessica Bratty, a DFO biologist working on the river, says the fishers have learned quickly which gravel bars and stretches of the river are most productive. Her overflight survey partner Lanny Kalnin says the move of anglers up-river is directly related to their success and is an indicator of things to come.

DFO had three people on temporary contract for the summer doing the survey. The river was flown in a charter aircraft on one weekday and one weekend day each week when a total rod count was done. The rest of the survey was done at access points and on the gravel bars where tackle in the water was counted every hour and individual interviews were carried out with anglers.

From all of the data gathered it is possible to produce accurate catch and effort statistics which will assist DFO in the management of the overall salmon fisheries. In addition to helping DFO with stack management the creel survey is a major indicator in the value of the fisheries to Fraser Valley communities and recreational groups.

"These recreational fisheries on the Fraser River are very important to local economies," says Irvine.

"The Fraser River may well be the most important single salmon resource area in the whole of North America. It is a significant resource in a global sense, a major resource on the provincial level, and a leading contributor to the recreation and economy of the Lower Mainland and many communities in the Interior," Irvine said. "I think it is kind of neat that our recreational angling community is growing at this rate and that this year they caught almost 7,000 chinook in the Fraser River."

Indicators are that the sockeye and chum fishery will be just as successful and that this growing recreational fishery will become a major contributor to local economies. ■

# A SOUND WAY TO COUNT SALMON

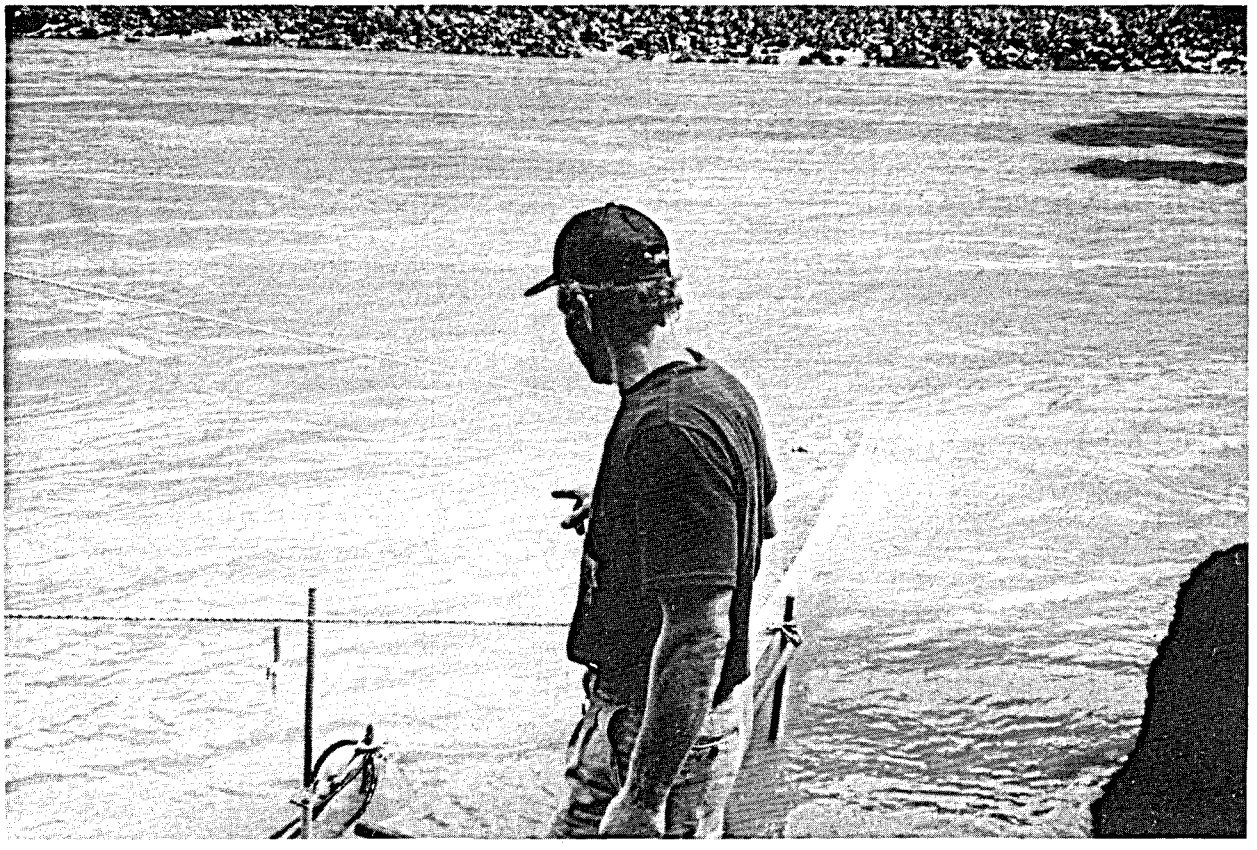
A new state-of-the art fully automated facility sits beside the Fraser River north of Hope, beaming sound out into the river to count and track fish. The experimental hydroacoustic station set up by the Department and Fisheries and Oceans at Qualark Creek is testing a new technique, which if it proves out, promises to give fisheries managers — and the public — greater confidence in the estimates of salmon numbers passing up the Fraser.

Hydroacoustic fish estimating techniques on the river are not exactly new. The Pacific Salmon Commission has had a facility at Mission since 1977, which provides daily estimates of salmon passing up the river toward their spawning grounds. These numbers provide a check on how many fish can be caught in the river while still permitting sufficient salmon through to spawn. They also give feedback on how close earlier run size estimates are — estimates that are used to set allowable catch limits for the various fisheries.

Problems in recent years with the West Coast salmon fishery highlight the importance of accurate estimates of fish numbers. The 1994 shortfall in the number of Fraser sockeye expected to return to the spawning beds prompted the federal government to set up the Fraser River Sockeye Public Review Board to investigate what went wrong. Questions about the accuracy of present estimation procedures formed part of their work.

Tim Mulligan, a DFO research scientist based at the Pacific Biological Station, heads up the combined DFO/Pacific Salmon Commission team conducting experimental hydroacoustic studies on the Fraser. The work addresses some of the concerns raised by the Review Board. "We have two main objectives," Mulligan states. "First, to test assumptions that underlie the current methods the Pacific Salmon Commission is using to estimate salmon numbers arriving at Mission. And second, to look at other more modern techniques to see if they are beneficial as potential replacements or augmentations to the systems the Salmon Commission is currently using."

One of these new techniques is undergoing testing at Qualark Creek. The system uses a split-beam acoustic signal that tracks fish as they move through the beam, much like a traffic-control radar system tracks planes. "We can track fish simultaneously, measure



*DFO's Herman Enzenhoffer monitoring the Qualark Creek facility on the Fraser River.*

how fast they're going and which direction they're moving," explains Mulligan. "With more modern instruments like the ones at Qualark you can get a lot more information from the echo than with the instruments used at Mission." Now in its third year of operation, the system is going through rigorous testing including a careful calibration with a test fishery.

The Pacific Salmon Commission, in cooperation with DFO, set up a second experimental station using similar split-beam technology at Mission this year. As Ian Todd of the Pacific Salmon Commission, says "the experimental work at Mission is an attempt to quantify some of the potential biases inherent in our original method."

Some of these factors include an inability to tell if fish are swimming up or downstream, whether fish are avoiding the boat and thus not being counted (the Mission hydroacoustic instruments are boat mounted), and whether fish are too close to the bottom of the river to be detected by the mobile equipment. The new technology is supposed to quantify these factors, thereby providing a check on the accuracy of the all-important daily salmon estimates.

But these are early days yet, and Todd cautions that the new technique is unproven, and in his opinion has yet to demonstrate it can improve on the present technology for supplying daily salmon abundance estimates.

"At this stage we don't have any evidence to suggest our estimates are anything but good," Todd says.

Over the next year, four other types of acoustic systems will be tested at Mission, as the scientists work to ensure that the salmon estimates are indeed accurate. For, as Mulligan points out, conservation of B.C.'s precious salmon stocks is DFO's prime directive: "The biggest risk we are trying to minimize is that insufficient numbers of fish will arrive at the spawning ground."

If the new hydroacoustic techniques live up to their promise, he argues, they will relieve the uncertainty surrounding the salmon estimates and help ensure enough fish make it back to spawn. ■

# ENVIRONMENTAL WATCH HELPS SALMON SURVIVAL

DFO scientists have been keeping an eye these days on water temperatures in the Fraser River system. Called *Environmental Watch*, the program monitors water temperatures and discharge levels to predict when conditions may take a turn for the worse for salmon migrating to the spawning grounds. The reason is: stress.

"High river temperatures and high discharge can seriously stress salmon," says DFO biologist Ian Williams, the head of Environmental Watch. "You want to know that these conditions are likely so you can modify fishing patterns to compensate for higher fish mortality during salmon migrations."

Such was the case in 1994, when high water temperatures in parts of the Fraser may well have killed many sockeye—a reason, recognized by the Fraser River Sockeye Public Review Board, for some of that year's shortfall in spawning returns. The board recommended that DFO set up a predictive water temperature model to give decision-makers early warning of stressful conditions for salmon. That way, fisheries managers can make adjustments to make sure enough fish return to spawn.

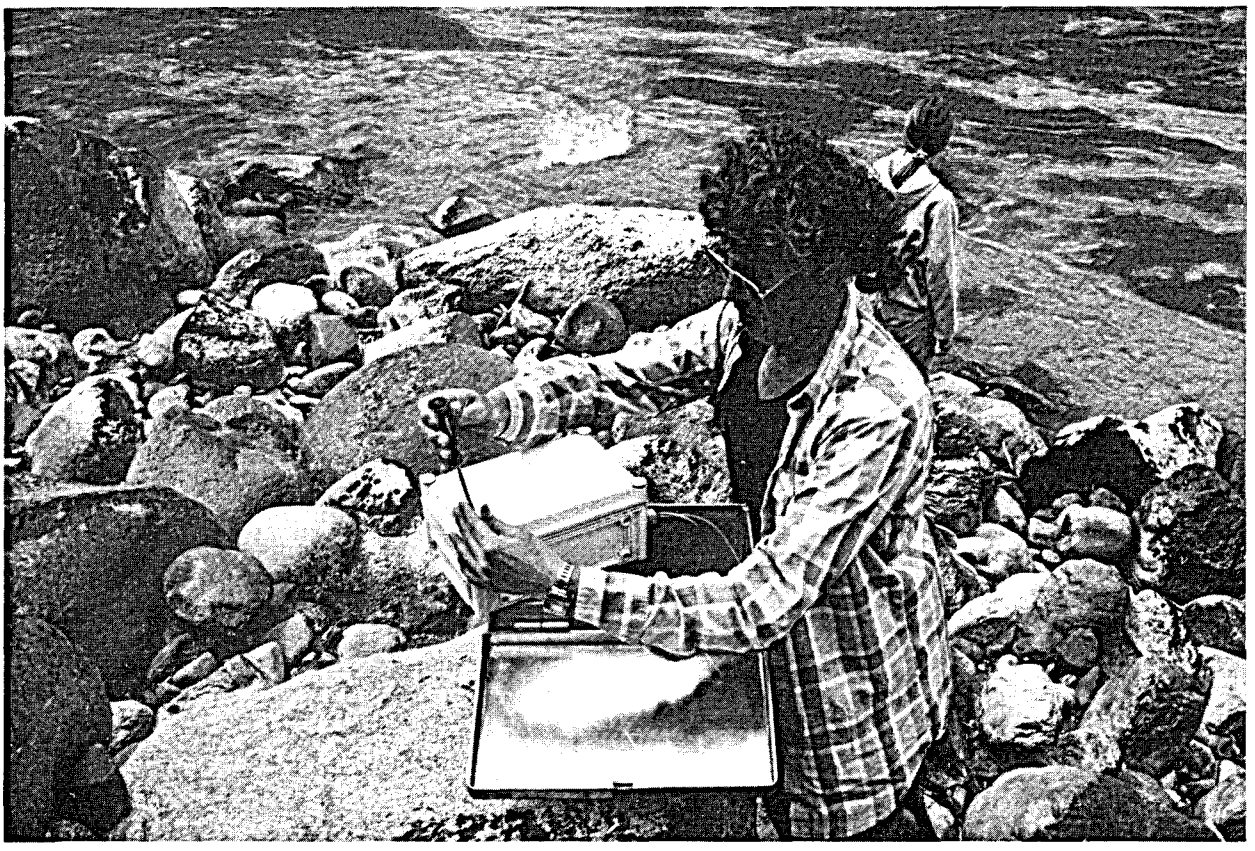
Environmental Watch is the department's answer. It includes the development of just such a temperature model and additions to DFO's extensive temperature monitoring program to make it more responsive.

DFO have been monitoring river temperatures and other environmental conditions for years. Williams points out that the department currently has temperature recorders at more than 30 sites on the Fraser from Hope up to the Stuart-Takla system in the northern reaches of the Fraser Basin, up the Thompson and the Nicola Valley, and on all major tributaries. Additional probes monitor conditions right on the spawning grounds. While the collected temperature information has helped lay the groundwork for the predictive model, and supply valuable insights on the effects of river conditions on the viability of salmon runs, it has not been available to fisheries managers in time to modify fishing plans for the salmon runs actually in the river—until this year.

"With Environmental Watch," Williams states, "we're getting environmental data in real time. Managers can actually use it when it counts."

To achieve this, the department installed new temperature monitoring stations, which, as Fisheries biologist Tom Brown points out, are accessible over phone lines: "We have four phone-up (temperature recorders) that I dial up on my computer and download the stored data directly."

The numbers are fed into a computer model of the Fraser River, which generates temperature predictions. "What the model does is predict temperatures in the river every 10 km for 10 days into the future," explains Mike Foreman, a research scientist at the Institute of Ocean Sciences who is in charge of the predictive temperature model. To do this the model incorporates many other pieces of information from weather forecasts, to historical data on past temperatures to real-



*Biologist Tom Brown monitoring environmental data, which includes river temperatures and discharge levels on the Fraser.*

time and projected flow data. It also uses data from another simulation model set up by Professor Michael Quick at UBC.

Funded in part by the Fraser River Action Plan, the model has just finished its first year of full predictive operation. Foreman feels the model is working well, considering it relies in part on weather forecasts, which are not always too accurate. "Over the last year we were less than a degree out," he says. Ray Lauzier, a DFO biologist, agrees: "We didn't have the model up and running in a predictive mode last year. This year (the model) was pretty much bang on, telling us what was going to happen a week or so ahead of time."

Armed with temperature predictions for the next 10 days, Environmental Watch biologists overlay the progress of salmon runs onto a temperature map of the river to assess whether river conditions will stress the migrating salmon, and if so, how many fish may die as a result. If the news is bad, and conditions in the river are predicted to take a high toll of returning salmon, then regional fisheries managers will reduce catch quotas or even close fisheries. "What we are trying to do is to compensate by allowing more salmon to escape the fisheries," Williams explains. "The key issue is to ensure we conserve fish populations."

As luck would have it, the 1995 season proved to be one of moderate river temperatures and good conditions for migrating salmon—unlike the previous year. With the threat of global warming, it is likely that the predictive capabilities of Environmental Watch will become increasingly important in the years to come. ■

**Stories of the Fraser continue on page 9**

THE SOUNDER

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# RESCUE MISSION O

A rock slide blocking the passage of adult sockeye and pink salmon up the Nahatlatch River this summer provided the catalyst to a joint effort by DFO staff and members of Aboriginal bands to save thousands of struggling salmon.

DFO habitat biologist Mike Crowe, who drove to the site near Boston Bar from Kamloops two or three times a week for six weeks, deemed the venture a success.

"It was impressive how everyone volunteered their services to achieve a mutually beneficial end," Crowe said.

The story of how a little human ingenuity and cooperation helped avert a local salmon setback had its genesis in a rock slide last spring. In the aftermath of the slide the site—a very confined canyon with high walls—was strewn with boulders and debris. A much narrowed canyon combined with increased velocity made the river impassable to salmon attempting to return to their spawning grounds.

Members of the Boothroyd and Boston Bar bands first became concerned in August after getting reports from Rio Rafting, a local rafting company just upstream, that there were no salmon spawning in the upper reaches of the river. After checking out the scene, band members quickly determined that the fish would have to be moved by hand upstream in order to protect the genetic mix of salmon in the Fraser River system.

Using dip nets and beach seines, band members began the laborious task of moving adult sockeye, whose energy reserves were being fast depleted by battling the series of high waves. The fish were netted out one at a time and then passed to runners who carried them for release upstream.

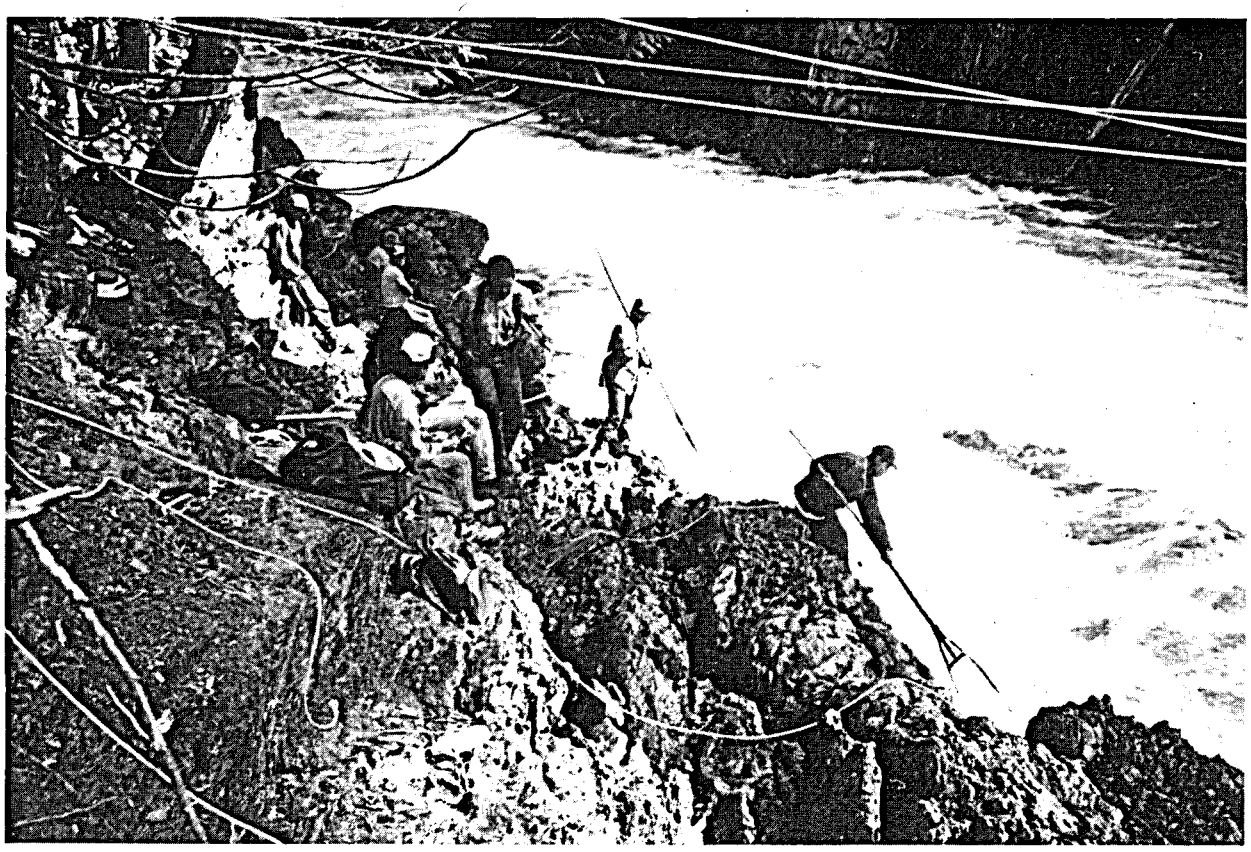
Phillip Campbell, a councillor with the Boothroyd Band, said the work was slow and tiring. But he noted that the assistance of DFO staff and other volunteers helped speed up the process.

"It was a pretty cooperative venture all around," Campbell said.

The word cooperative was key to the whole venture. Rio Rafting allowed volunteers access through their property, and also provided a safety net by having kayakers on hand just downstream from where the dippers were working to retrieve anyone who might slip into the river from their rocky perches.

Blake Covernton, an ex-commercial fisherman from North Vancouver, heard about the rescue mission and decided to drive up and volunteer his services. He ended up spending the better part of five weeks on site, and came away with 40 hours of film footage which he plans on making into a half-hour documentary. Covernton also managed to get four fishing suppliers—Ocean Fisheries, Canadian Fishing, Queensboro Marine Equipment and Redden Net—to donate netting gear supplies.

# N THE NAHATLATCH



"I have to say it was one of the most enjoyable five weeks of my life," Covernton said. "Given all the controversies surrounding the fisheries resource, it was a breath of fresh air to see how well everyone worked together."

Meanwhile, DFO hired a geo-technical team to assess whether remedial blasting to remove the larger chunks of rock blocking the river and/or create a chute through the left bank would bring more rock down the slide location.

Crowe noted that the provincial Ministry of Forests pitched in at very short notice to determine whether there was any danger of trees falling on the nets. Once the coast was clear, the blasting took place Sept. 19, with the work donated by G.S. Jones Timber Ltd., a local logging company.

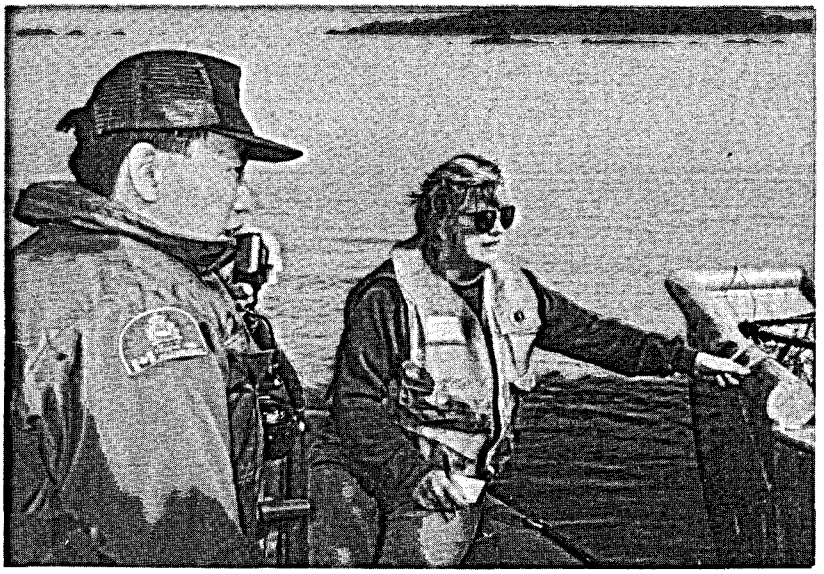
The blasting helped, more so than DFO staff initially estimated. Crowe noted that a helicopter overflight revealed that far more fish made it to the spawning grounds on their own than previously thought. Human hands moved about 1,900 sockeye and 4,000 pinks. However, Crowe estimated that about 7,000 pinks made it through on their own.

DFO engineer Ed Woo, acting head of new projects in the Habitat Enhancement Branch, says the next step is to go in this winter when the water level is lower to do some more blasting. The debris will then be carried away in the spring freshet. ■

Stories of the Fraser continued from page 5

# ENHANCING COOPERATION IN THE ABORIGINAL FISHERY

As dawn breaks over the Fraser River, shadowy forms haul in a gill net laden with illicit salmon. It's July 1995, and poachers beneath the Alexandra Bridge, near Spuzzum, are in for a surprise. Two Sto:lo Nation Aboriginal fishery officers, who have had them under surveillance, move in and seize their net and fish. They are soon joined by DFO fishery officers, responding to a back-up call from their colleagues. The joint bust results in charges of illegal fishing against three individuals, one of whom has his Aboriginal fishing card suspended. Welcome to the new get-tough enforcement policy in the Aboriginal fishery.



*Patrolling the Fraser River: Steveston fishery officer Brian Atagi, and Frances Dickson, chief of fisheries management for the Fraser River Division.*

DFO's agreements with various First Nations groups on the Fraser came under scrutiny in 1994, as the Fraser Review Board strove to uncover the reasons for a dramatic drop in sockeye returns that year. Among the board's recommendations were calls for DFO to improve the training programs in fisheries management and enforcement in the Aboriginal fishery, and to tighten up the procedures for landing and counting fish in the pilot sales program, where some First Nations groups are permitted to sell food salmon.

The enhanced level of cooperation in enforcement was one of several approaches taken by DFO to respond to the board's concerns about the Aboriginal fishery.

"Our response was to look at the recommendations and go out and consult with the two major aboriginal groups that have pilot sales agreements and negotiate more cooperative fisheries agreements," says Don Aurel, area chief of Conservation and Protection for the Fraser River Division. "The agreements in the past basically just created Aboriginal Guardians that were employed and supervised by the bands. They said very little about the working relationship between Native groups and DFO," Aurel explains.

This year's agreements contain a more formally structured framework that requires DFO and Aboriginal fishery officers to work more closely together: "We carry out regular meetings and cooperate in exchanging enforcement and patrol information. There is a clear operational understanding that works more effectively."

Ed Kelly, director of enforcement for the Sto:lo Nation Fisheries Program, whose officers were involved in the Alexandra Bridge poaching bust, sees the effects of the closer cooperative climate all the way down the line: "We've established what I feel is an excellent working relationship between the DFO field supervisors and myself, and that relationship is spreading, not only amongst ourselves but down to the regular DFO officers and my officers."

Kelly points to improved communications, frequent joint operations and lots of information-sharing as critical factors in the better relationship. The resulting heightened level of enforcement activity—Sto:lo fishery officers laid 12 charges this year—sent a clear message that illegal activities would not be tolerated. "As soon as we laid the first charge," Kelly remembers, "the word spread along the river pretty fast."

DFO has gone even further in some areas toward integrating its own enforcement activities with those of Aboriginal fishery officers. "In two situations we have hired staff from First Nations that have the higher levels of training and they are now DFO fishery officers," explains Bert Ionsen, the Fraser River coordinator for DFO's Aboriginal Fishery Branch. Fully trained and supervised by the DFO, they help coordinate the efforts of the Aboriginal fishery officers in the Native fishery.

Also new this year, DFO tightened up pilot sales agreements with First Nations groups. Fishers are now required to take their catches within a set time to specific designated landing sites where monitors iden-

tify and count the fish by species. The whole process is watched over by independent auditors who make spot checks on the accuracy of the aboriginal monitors.

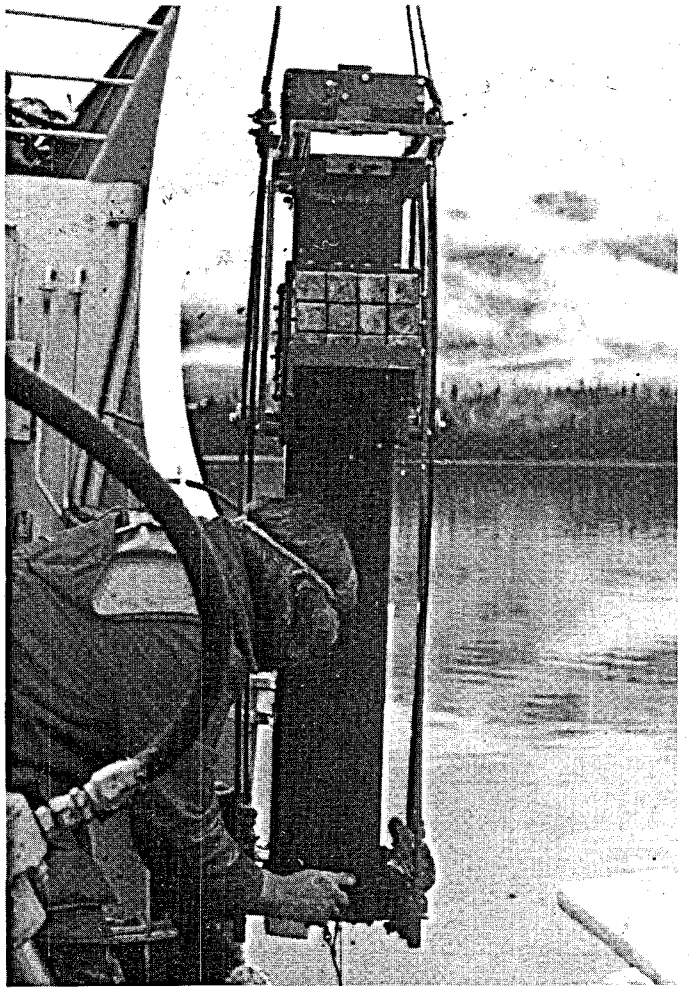
In the past, the Aboriginal catch was estimated by sampling a given number of nets and extrapolating to the total number of nets in the fishery. "There was the perception that DFO didn't have a reasonably reliable estimate of the Aboriginal catch," says Ernie Crey, spokesman for the Sto:lo Fisheries Authority. "So DFO's response was to encourage us in the agreement to adopt the mandatory landing program. This is thought to reduce the uncertainty as to our catch to around zero."

In general, the changes DFO has made in the Aboriginal fishery seem to be working. "Taking everything together, things went really well this year," says Crey. "I feel a lot better about the working relationship between our officers and DFO, and I'm satisfied that the skill and expertise of the monitors in the mandatory landing program have improved—the program has a really good handle on what the catch in fact was." ■

# EXAMINING THE SEA FLOOR IN KITIMAT ARM

Visitors to Eurocan's recent 25th anniversary celebrations in Kitimat had an opportunity to "climb aboard" CSS VECTOR, one of DFO's coastal research ships.

The VECTOR is the platform for a research project aimed at piecing together the history of toxic chemicals in Kitimat Arm. The project is being led by Dr. Walt Cretney, a research scientist at the Institute of Ocean Sciences. Alcan Smelters and Chemicals Inc. also contributed to the project.

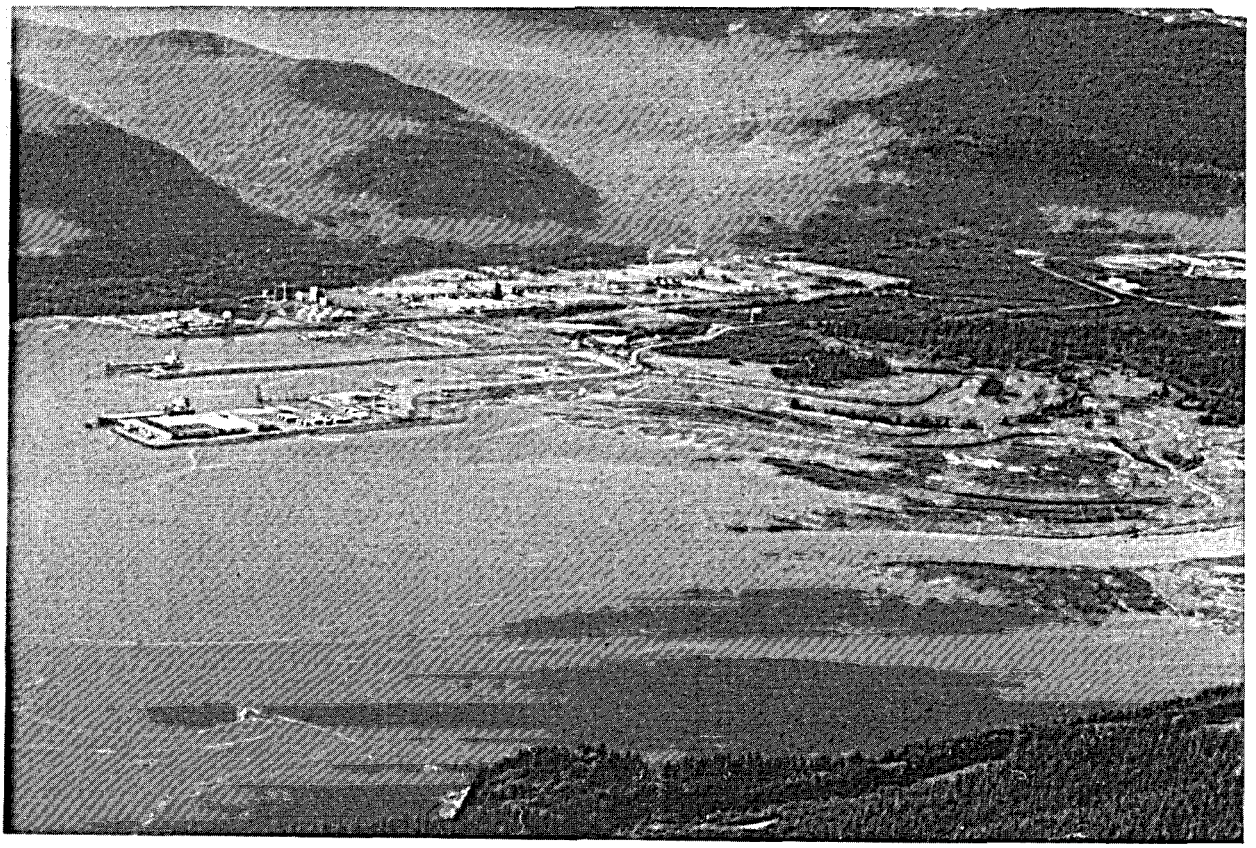


Cretney and his team are following up on an earlier assessment of Kitimat Arm completed in 1978/79. That survey showed that the concentration of polycyclic aromatic hydrocarbons (PAH's) in surface sediments throughout Kitimat Arm was highest near Alcan's aluminum smelter, the principal source of this particular contaminant.

However, while surface sediment samples provide information about the current concentration of chemicals, scientists also want to find out how present day contaminant levels compare to those which existed before a particular industrial or municipal development occurred. They can do this by analyzing sediment cores, plugs of sediment collected much like an apple corer takes the core out of an apple.

A sediment core provides a window on past accumulation of both natural and human-made chemicals. The sediments in the location being sampled must have been built up, layer upon layer, with no more than one or two major disturbances, such as submarine slides. The sediment corer being used by Cretney is a device which is lowered, almost in freefall, through the water column and almost 50 cm into the sea bottom.

Once the core has been winched back up onto the deck of the VECTOR, the core is carefully sectioned and subjected to a battery of analyses to determine the age of the sediments and their contaminant burdens. Telling how "old" a sediment layer is requires finding out how fast the layers are being built up. The rate can vary from centimetres per thousand years in the ocean deeps to



*An aerial view of the Kitimat Arm where work is underway to piece together the history of toxic chemicals in the area.*

several centimetres per year in river estuaries.

The main method of determining the rate of build up involves cutting the core into sections, measuring radioactive isotopes of elements and doing some mathematics. Other ways to establish a chronology for sediments include counting the annually deposited layers or varves in cores, when they can be seen, or counting pollen grains which concentrate annually each hay-fever season.

Measuring pollutants in all sections of the sediment core enables scientists to determine the history of deposition. Cretney's project is focusing on PAHs, chlorinated dioxins and furans as well as other compounds generated by local industrial, municipal, or natural (such as forest fires) processes.

Sediment cores collected in 1978/79 indicated higher levels of PAHs in the marine environment than would occur naturally, following the beginning of aluminum production at Alcan's Kitimat smelter in 1954. PAH levels increased in concentration annually until the time of the 1975 submarine slide, which unfortunately spoiled the subsequent sediment record. Newly collected cores will show if sediment concentrations of PAHs and dioxins/furans have decreased in the last two decades. This will also demonstrate whether or not action taken to reduce or eliminate these contaminants has been effective.

In addition to collection and analysis of sediment cores, Cretney and two graduate students from the University of Victoria and Simon Fraser University are collecting samples of fish and shellfish for analysis. English sole have been the main target of trawling from the VECTOR, because they are a preferred "environmental sentinel organism" for pollutants on the west coast of North America,

Cretney is also studying hatchery raised juvenile chinook salmon captured before and after their release to Kitimat Arm looking for any evidence of uptake of PAHs. In collaboration with associates from DFO in Newfoundland and the University of Victoria, he is looking for any evidence of damage to juvenile chinook salmon DNA attributable to PAHs.

Although the results of his reassessment are still very preliminary, Dr. Cretney is confident that the results obtained thus far indicate a marked reduction in sedimentary levels of dioxins and furans in the area. He expects to have final results in 1996.

*– Kelly Francis*

# SOUNDER'S SWAN SONG

After 23 years, it's curtain time for The Sounder. But the staff newsletter will not bow out for long. In its place, a publication reflecting the new DFO will premiere next month.

The move is part of the merger with the Canadian Coast Guard which took place in April 1995, and the new newsletter will replace both organization's internal newsletters. And, in the grand old tradition of staff newsletters, we will be asking you to come up with a new name, along with soliciting your valuable suggestions on what kind of stories you want to see.

As editor for the past three-and-a-half years, I want to thank all of you who contributed the ideas, stories and photographs that went into each issue. I was always impressed with the dedication and enthusiasm shown by those of you who took time out from your busy schedules to share with your colleagues the diversity of activities and challenges encountered in the course of your work. Whether in the field of ground breaking DNA research or historic voyages to the Arctic Ocean, it was always exciting to hear first-hand your discoveries, challenges on the job and often humorous anecdotes. (Remember Joe Kambeitz's account of his stint as a fishing guide in Russia last year? Trust me, the unexpurgated version was much funnier).

In writing this piece, and digging through archives (actually Colin MacKinnon's bulging filing cabinets), I discovered some equally fascinating bits of historical trivia; namely, the humble beginnings of The Sounder and its ensuing checkered career.

In 1972, the department's first newsletter emerged on the scene: The Fishing Line. The Fishing Line, published by the long defunct Fisheries Staff Association and edited by Joe Arsenault, was a four-page, and, as it turned out, one-shot news sheet. Its inaugural issue presented a smorgasbord of subjects—an announcement of a department picnic, a recipe for crab meat salad cups and a story on the protection of spawning beds from pollution in the Tsolum River.

Following on its heels was The Sounder's forerunner: NOB News, (short for North Operations Branch), which made its debut in March 1972. The brainchild of Al Wood, director of Program Planning and Economics, the newsletter carried news stories from local dailies and community newspapers as well as articles written by departmental staff. In addition to circulation at the old regional headquarters building at 1090 West Pender, NOB News was sent to field services staff, who were divided into a Northern Operations Branch and SOB (South Operations Branch, that is).

After five months, NOB News underwent a change in name and format. A "name the newsletter" contest encouraged scores of entries. Some of the more memorable monikers included Murky Monthly, Cry of the Wild Sockeye, Son of Nob News and Filet of Fish Tales. The name chosen was Sounder, submitted by Alice Sunderland. The new name was emblazoned across the September 1972 issue, with staff contributions its central focus.

Over the years the physical appearance of The Sounder has changed considerably. The masthead initially incorporated a whimsical sketch by the aforementioned SEP Community Advisor Joe Kambeitz of a gape-mouthed fish (and what looked like an octopus with shades). In 1980, it was replaced by a five-centimetre high illustration of Pacific Region that bore a striking resemblance to a boot. Later masthead facelifts included the "squiggle," DFO's official logo for several years, and the one you see now, designed two years ago.

As for content, there have been a variety of columns over the years, policy and fishery reports and popular staff notices such as Spurious Emissions (now Tidings). There were lots of letters to the editors, with a multitude of staff expressing their ideas, opinions as well as venting their frustration.

As the department changes in the months and years to come, we hope you will continue to stay in touch and send us your thoughts on making your newsletter a timely and relevant communications aid.