

YUKON RIVER JOINT TECHNICAL COMMITTEE REPORT

prepared by:

**The Joint Canada/ United States
Yukon River Technical Committee**

February 24-26, 1997

Anchorage, Alaska.

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 1997 YUKON RIVER SALMON RUN OUTLOOKS.....	2
2.1 ALASKA.....	2
2.1.1 Chinook Salmon	2
2.1.2 Summer Chum Salmon	2
2.1.3 Fall Chum Salmon.....	2
2.1.4 Coho Salmon	3
2.2 CANADA.....	4
2.2.1 Chinook Salmon	4
2.2.2 Fall Chum Salmon.....	5
3.0 INFORMATION EXCHANGE ON PRELIMINARY MANAGEMENT PLANS FOR 1997	6
3.1 1997 UNITED STATES MANAGEMENT PLAN.....	6
3.2 1997 CANADIAN MANAGEMENT PLAN.....	7
3.3 JTC DISCUSSION ON PRELIMINARY MANAGEMENT PLANS.....	8
4.0 CO-ORDINATED PROJECT PLANNING FOR 1997	10
4.1 UPPER YUKON RIVER FALL CHUM SALMON TAGGING PROJECT	10
4.2 STOCK IDENTIFICATION RESEARCH STUDIES	11
5.0 STATUS OF PILOT STATION SONAR ON THE YUKON RIVER IN 1997	12
6.0 STATUS OF THE JTC TECHNICAL REVIEW OF RESTORATION AND ENHANCEMENT FUND PROPOSALS	12
6.1 BACKGROUND	12
6.2 SUMMARY OF JTC TECHNICAL REVIEW ACTIVITIES	13
6.3 RESULTS AND DISCUSSION	14
7.0 STATUS OF THE STOCK IDENTIFICATION DISCUSSION PAPER.....	16
APPENDIX I.....	17
ATTACHMENT I	18

1.0 INTRODUCTION

The Yukon River Joint Technical Committee (JTC) met at the Alaska Department of Fish and Game (ADF&G) office in Anchorage on 24-26 February, 1997. The purpose of the meeting was to address the following agenda items tasked to the JTC by the Yukon River Panel in November 1996 for the next Yukon River Panel meeting scheduled 17-21 March 1997 in Whitehorse:

1. Salmon run outlooks for 1997.
2. Exchange information on fishery management plans for 1997, to the extent available.
3. Co-ordinate project planning for 1997.
4. Inform the Panel on plans for the Lower Yukon River sonar project at Pilot Station for 1997.
5. Report on the status of the R&E Fund proposal technical review process by the JTC for the 1996/97 review cycle.
6. Report on the status of a stock identification discussion paper in preparation by the JTC.
7. Other business?

This report is organised into six subsequent sections which correspond with the above-noted agenda topics. No "other business" items were identified for the agenda.

The meeting was attended in part, or in entirety, by the following persons:

Alaska Department of Fish and Game

Larry Buklis (co-chair)
Elizabeth Andrews
Louis Barton
Dan Bergstrom
Dana Bruden
Jeff Bromaghin
Rich Cannon
Russ Holder
Dan Huttenen
Bob Paulus
Dan Schneiderhan
Keith Schultz
Lisa Seeb

Canadian Department of Fisheries and Oceans (DFO)

Sandy Johnston (co-chair)
Ian Boyce

U.S. Fish and Wildlife Service (USFWS)

Steve Klein

National Marine Fisheries Service (NMFS)

Richard Wilmot

Tanana Chiefs Conference (TCC)

Paul Headlee

Bering Sea Fishermen's Association (BSFA)

Jude Hensler

2.0 1997 YUKON RIVER SALMON RUN OUTLOOKS

2.1 ALASKA

2.1.1 Chinook Salmon

The majority of chinook salmon returning to the Yukon River are 6-year-old fish; however, 5- and 7-year old fish make a significant contribution to the run. Spawning ground escapements in 1991, the brood year producing 6-year-old fish returning in 1997, were judged to be average to above average in magnitude. Additionally, the return from this brood year as 5-year-old fish in 1996 appeared to be above average. The 7-year-old return is expected to be weak based upon the low contribution of age-6 fish in the 1996 run. The return of 5-year-old fish in 1997 is expected to be below average to average in abundance based on the spawning escapements observed in 1992. Overall, the strength of the 1997 chinook salmon run is anticipated to be near average. The commercial harvest in Alaska is expected to total 88,000-108,000 chinook salmon (82,000-100,000 fish in the Lower Yukon Area and 6,000-8,000 fish in the Upper Yukon Area). The chinook salmon commercial guideline harvest range for the Alaskan portion of the Yukon River drainage is 67,350 to 129,150 fish.

2.1.2 Summer Chum Salmon

The return of 5-year-old fish in 1997 is expected to be average based on spawning escapements observed in 1992 and the contribution of 4-year-old fish in the 1996 run. A below average to average return of age-4 summer chums is expected. Summer chum salmon spawning escapement to the Anvik River in 1993 was 517,000, slightly above the escapement goal of 500,000. However, escapements to other spawning areas in 1993 appeared to be below average based upon aerial surveys. Overall, the 1997 outlook is for a below average to average summer chum salmon run. The commercial harvest is expected to range from 200,000 to 600,000 fish. The summer chum salmon commercial guideline harvest range for the Alaskan portion of the Yukon River drainage is 400,000 to 1,200,000 fish.

2.1.3 Fall Chum Salmon

Drainage-wide fall chum salmon escapements for the period 1974 through 1990 have been estimated by ADF&G to have ranged from approximately 110,000 (1982) to 1,200,000 (1975) based upon expansion of escapement assessments for selected stocks to approximate overall escapement abundance. Escapements in these years resulted in subsequent returns which ranged in size from approximately 301,000 (1988 production) to 1,400,000 (1975 production) fish, using the same approach to approximating overall escapement. Corresponding return per spawner rates (R/P) ranged from 1.1 to 4.5. The average return per spawner for all years combined was 2.4.

A Ricker spawner-recruit model was used by ADF&G to predict the returns of fall chum salmon from the 1991 to 1994 parent years which will contribute to the 1997 run. This process resulted in a projection of approximately 750,000 fish with the following approximate age composition:

Age-3 fish	56,000 (1994 Brood Year)
Age-4 fish	423,500 (1993 Brood Year)
Age-5 fish	262,000 (1992 Brood Year)
Age-6 fish	8,500 (1991 Brood Year)

A run of 750,000 fall chum salmon is below average by more than 40,000 fish for all years combined and more than 200,000 fish for odd-numbered year returns. The expected major contributor to the 1997 run will be from the brood year 1993. In that year a state-wide chum salmon failure occurred, with the lowest fall chum salmon run on record reported for the Yukon River of approximately 330,000 fish. Although no fall season commercial fishing was permitted in the Alaskan portion of the drainage in 1993, and severe restrictions (including partial closures) were imposed on the subsistence salmon fishery, resulting escapements were poor to most areas throughout the drainage.¹

The strongest escapements relative to goals were observed in the Tanana River with Delta River escapement being 81% above its minimum goal of 11,000 chum salmon (the only escapement goal achieved in 1993). Escapement to the Toklat River was 27,800, falling approximately 16% below the minimum goal of 33,000 chum salmon. Escapements were comparatively weaker in 1993 relative to goals for non-Tanana River stocks. Escapement to the Sheenjek River (43,000) was 33% below the minimum goal of 64,000 chum salmon. The weakness anticipated in the 1997 fall chum salmon run will probably be among the returning age-4 non-Tanana River stocks.

The management plan adopted by the Alaska Board of Fisheries directs that only when the fall chum salmon run is estimated to be more than 600,000 fish can the department consider a directed Yukon River fall chum salmon commercial fishery. Should the 1997 fall chum salmon run materialise as projected, the run size would be sufficient to not only meet escapement, subsistence, and border passage objectives, but also provide for Alaskan commercial opportunity.

2.1.4 Coho Salmon

Although comprehensive escapement information on Yukon River coho salmon is lacking, it is known that coho salmon primarily return at age-4. Assuming average survival, results from limited escapement surveys in 1993 suggest no better than an average return of coho salmon in 1997. There is no guideline harvest range for Yukon River coho salmon. Coho salmon exhibit later but overlapping run timing with that of fall chum salmon. Any commercial harvest of coho

¹The U.S./Canada Yukon River Panel modified the Canadian mainstem fall chum salmon rebuilding plan in November 1996, due to the very poor escapements realised in 1993. The spawning escapement goal for 1997 was lowered from 66,000 to 49,000 chum salmon, although the objective of rebuilding the 1993 brood year to the desired level (>80,000) by the year 2001 was retained.

salmon in 1997 will be largely dependent upon the abundance of fall chum salmon and accompanying management strategies to harvest that species.

2.2 CANADA

2.2.1 Chinook Salmon

The expected total run size of Canadian origin, upper Yukon chinook salmon for 1997 is approximately 134,000 fish. In comparison, the upper Yukon chinook run size averaged approximately 140,000 fish during the six year cycle from 1990 to 1995². Qualitatively, the 1997 run is therefore expected to be about **average** in magnitude. The 1997 run outlook is based on escapement data for 1990 through 1992, calculated returns per spawner for the individual brood year escapements based on the spawner-recruitment relationship for the 1980 to 1989 brood years, and the average age composition. The interim escapement goal range for rebuilt upper Yukon chinook (excluding the Porcupine) is 33,000 to 43,000 chinook. The Panel has agreed that, as part of a chinook salmon rebuilding plan, the escapement goal for the period 1996 through 2001 is 28,000 chinook salmon. With the exception of 1990, spawning escapements in the principal brood years of the 1997 run were below both of these targets.

In order to examine the relationship between escapement and production, returns were reconstructed for the 1980 to 1989 brood years. This incorporated age compositions of spawning escapements and harvests of Canadian origin chinook in the U.S. and Canada. In years when spawning escapement data were not available, adjusted age compositions from the DFO fishwheels upstream of the Canada/U.S border were used. Escapements for 1980-81 and 1984 were estimated by expanding a cumulative five-area escapement index (Tatchun Creek, Big Salmon R., Nisutlin R., Wolf R., and the non-hatchery returns to the Whitehorse Fishway) by the average proportion the index represented of the total escapement estimates derived from DFO mark-recapture studies in 1982-83, and 1985-89. Mark-recapture results were used to estimate the escapement in 1982, 1983 and 1985 through 1996.

The total return from each brood year escapement was estimated by apportioning the total annual run sizes in the principal return years by the average age composition. On average, the majority of adult chinook return at six years of age (56%) with significant numbers returning at age seven (16%) and age five (22%). Annual run sizes were reconstructed from ADF&G scale pattern data and DFO tagging results.

The relationship between the natural logarithm of the return per spawner (R/S) and number of spawners (S) for the 1980 to 1989 brood years is described as follows:

$$\ln(R/S)=2.411-0.0282(S); \quad [1]$$

where: S = # spawners (in thousands),
R = returns.

² The total run size in 1996 has not been estimated for chinook or fall chum salmon since total harvest for that year is not available at the time of printing. Therefore, the run size cycle averages ending in 1995 are used for comparison purposes.

The correlation coefficient (r^2) of this regression is 0.57 and the relationship is significant ($p < 0.05$).

Based on equation [1] and the average age composition, the estimated returns from the principal brood years in 1997 are as follows:

Brood Year	Esc.	Calc'd Ln(R/S)	Calc'd R/S	Est'd prod'n	1997 Return
1990	37,699	1.348	3.850	145,133	23,676
1991	20,743	1.826	6.209	128,799	72,006
1992	25,497	1.692	5.430	138,460	30,461
sub-total (accounts for 94% of the return)					126,142
Total Expected Run Size in 1997 (rounded)					134,000

2.2.2 Fall Chum Salmon

On average, 71% percent of upper Yukon adult chum salmon are four years old and 27% are five years old. This suggests that the major portion of the 1997 fall chum run should originate from the record low escapement of 29,743 chum salmon in 1993, which was well below the recent cycle average of 102,220 fish (1993-1996). Additional returns can be expected from the 1992 escapement of 49,082 chum, which was also below average. The escapement goal for rebuilt upper Yukon chum salmon is >80,000 fish; a rebuilding program for upper Yukon chum is currently scheduled to be completed by 2001.

Assuming an average productivity of 2.5 returns per spawner (R/S), and using the brood year escapements and the average age composition, a total run of approximately 88,000 upper Yukon chum salmon was initially projected for 1997. The productivity rate of 2.5 R/S is used in the joint Canada/U.S. upper Yukon chum salmon rebuilding model and has been used in recent years by DFO for developing run expectations. However, apparent productivity rates of Yukon fall chum index stocks for the 1991 and 1992 brood years exceeded 2.5 R/S. Given this fact, plus the fact that a record low escapement was observed in 1993, selected productivity rates of 3.5 R/S for 1993 and 3.0 R/S for 1992 are considered reasonable and more appropriate than 2.5 R/S. The expectation using these revised productivity rates indicates a run size of 116,000 chum salmon for 1997.

It should be noted that this expectation is significantly greater (55% higher) than that which was developed using the upper Yukon chum rebuilding model, with its assumed productivity of 2.5 R/S and age composition of age-four fish only. For the purpose of that model, a projected run size of only 75,000 was calculated and presented to the Yukon River Panel in November 1996, although the limitations of the simplified approach were pointed out to the Panel by the JTC, at that time. The model, which was used some years ago to establish the original rebuilding plan,

was carried forward to assist in the formulation of a new rebuilding plan for the 1993 brood year to achieve an escapement of >80,000 upper Yukon chum salmon by the year 2001.

Although there are insufficient stock identification data for Yukon chum salmon from which to accurately estimate annual run sizes, assumptions have been made to allow the 1997 outlook to be expressed in terms of the average estimated run size. Run size estimates for previous years were developed, by DFO, based on the following assumptions:

- a) 30% to 50% of the U.S. catch of fall chum is composed of Canadian origin fish;
- b) the U.S. harvests Canadian stocks in the same ratio as: upper Yukon border escapement-to-Porcupine border escapement; and,
- c) the Porcupine border escapement consists of the Old Crow catch plus the Fishing Branch escapement.

Using these assumptions, the 1992-1995 four-year cycle average total run size of upper Yukon Canadian-origin chum salmon is estimated to have been in the range of 151,000 to 179,000 fish. The forecast of 116,000 upper Yukon chum salmon for 1997 is therefore **well below average**.

The chum salmon run to the Canadian portions of the Porcupine drainage in 1997 should originate primarily from the 1993 escapement. The escapement to the Fishing Branch in 1993 was 28,707 chum salmon (weir count). This is below the 1993-1996 cycle average of about 55,800 fish and the lower end of the interim escapement goal range of 50,000 to 120,000 chum for the Fishing Branch River. The total run size in 1997 is expected, by DFO, to be approximately 91,000 chum. This expectation is based on the same productivity rates as assumed for upper Yukon chum salmon (3.5 R/S for the 1993 brood year and 3.0 R/S for the 1992 brood year), and an average age composition of 71% age four and 27% age five. The Canadian-origin Porcupine chum stock size is estimated to have averaged 60,000 to 70,000 fish over the 1992-1995 four-year cycle (based on the assumptions previously described). The 1997 expectation by DFO is therefore for an **above average** run size.

3.0 INFORMATION EXCHANGE ON PRELIMINARY MANAGEMENT PLANS FOR 1997

Management plans for 1997 Yukon River fisheries are still in the developmental stage and as such, the following should be viewed as very preliminary information. Final plans will not be drafted until public review processes in each country have been completed, likely by May in Alaska, and by the end of May or early June in Canada.

3.1 1997 United States Management Plan

Throughout the Alaskan portion of the Yukon River drainage, commercial fisheries management will be focused on conservation and subsistence priorities. Management plans for the 1997 Yukon River salmon fisheries in Alaska are still being developed; it is anticipated that final plans

will be completed by May. The final plans will be forwarded to DFO in Whitehorse for distribution in Canada at that time.

It is anticipated that chinook salmon management will be targeting the midpoint of the chinook salmon guideline harvest range, with commercial fishing on the lower river beginning after a seven to ten day build-up in subsistence and/or test net catches. Based on the preseason outlook, summer chum salmon management will be targeting the lower end to midpoint of the summer chum salmon commercial guideline harvest range. Actual commercial harvest levels of chinook and summer chum salmon will depend on inseason run assessment.

It is anticipated that as a result of rebuilding efforts for both the Canadian and Toklat River fall chum salmon stocks, the Alaskan commercial fishery will be lower than the maximum harvest level that could be supported by the Yukon River fall chum salmon run. An Alaskan commercial harvest up to 135,000 fall chum salmon could be expected if the fall chum salmon return is as projected. This level of commercial harvest would provide for an Alaskan commercial harvest approaching the first quartile of each district's guideline harvest range. The combined guideline harvest range for all districts is 72,750 to 320,500 fall chum salmon. Additionally, based on available management tools, the department may adjust the fall chum salmon run size projection and corresponding commercial harvest upwards or downwards as the 1997 fall chum salmon run is assessed inseason.

Regulations affecting the Alaskan Yukon River salmon fisheries are scheduled to be reviewed by the Alaska Board of Fisheries in December 1997. The deadline for submission of possible regulatory changes is 10 April, 1997. Some of the regulations that the Board will be reviewing include *The Yukon River Drainage Fall Chum Salmon Management Plan* and *The Toklat River Fall Chum Salmon Rebuilding Plan*. Additionally, the Alaska Board of Fisheries will be considering the adoption of a possible *Yukon River Drainage Coho Salmon Management Plan* during the December 1997 meeting.

3.2 1997 Canadian Management Plan

The 1997 Canadian management plan for Yukon River fisheries is in the developmental stage and will be finalised following meetings with fishers and the Yukon Salmon Committee in May or June. For chinook salmon, the management plan is expected to be similar to that developed in recent years with primary consideration focused on the escapement objective of 28,000 chinook and the overall Canadian upper Yukon chinook guideline harvest range of 16,800 to 19,800 chinook salmon. Given the outlook for an average run, it is expected the total harvest will fall towards the midpoint of the range.

Serious conservation concerns exist for the fall chum season. Discussions about potential management actions have been initiated with the Yukon Salmon Committee in Canada. Consideration is being given to developing a two step decision point approach for the chum season. At the initial decision point, which will likely occur sometime in early August, it will be determined whether a commercial fishery for chum salmon will be permitted to occur during the mid-August to mid-September period. This normally constitutes the first half of the chum

season. The decision will be based on the accumulated fall chum salmon stock information compiled from all sources (ADF&G, USFWS, and preliminary run data collected by DFO) through weekly telephone conferences and/or data sharing.

The second decision point would occur around the second week of September at which time openings in the commercial fishery after that point would be decided. Decisions at this time will be based on the best available run assessment information for the upper Yukon stock, i.e. primarily the DFO mark-recapture program with additional information from upper river test fishery information in Alaska and preliminary escapement information from other up-river tributaries in Alaska.

Because the run is expected to be well below average, it would be optimistic to expect the total Canadian upper Yukon chum salmon harvest to reach the lower end of the guideline harvest range (23,600 to 32,600).

Run assessment capabilities in Canada during any closed periods are expected to be maintained through a co-operative effort with the Yukon River Commercial Fishers Association who, subject to R&E funding, have proposed to operate live-capture (i.e. non-consumptive) fishwheels during extended closed periods.

3.3 JTC Discussion on Preliminary Management Plans

A number of issues were raised during a lengthy discussion which focused primarily around points raised by the Canadian members of the JTC. A summary of the key points is described below:

1. the appropriateness of basing the 1997 upper Yukon chum salmon outlook on a fixed productivity of 2.5 returns/spawner. The overall productivity of Yukon River drainage fall chum salmon (stocks combined) has appeared to be well above 2.5 returns R/S since 1990 based on an analysis conducted by ADF&G. The analysis includes data since 1974 which attempts to reconstruct brood year (BY) returns based on catch, expanded escapement estimates and age composition data. During this time series, estimated returns/spawner have ranged from 1.1(1975 BY) to 4.5(1982 BY) and have averaged 2.4 R/S. Although it is acknowledged the analysis is general in nature and may not be directly applicable to upper Yukon stocks, the range of productivities resulting from the analysis appear reasonable and may be useful as a basin-wide index. It was noted in the meeting that the productivity of the 1991 BY already appears to be >3.40 R/S and the six-year-old component has yet to be accounted for. The 1992 productivity based only on the return of age-3 and age-4 fish already appears to be >2.53 R/S with age-5 and age-6 fish yet to be accounted for.

Based on this information, in combination with a consensus that it would be reasonable to expect the low escapement in 1993 to result in a higher rate of production, the JTC concluded that it would not be unreasonable to base the 1997 outlook on productivities greater than average. This conclusion was incorporated into the 1997 run outlooks produced by DFO for upper Yukon and Porcupine chum salmon as described in Section 2.2.2.

2. the appropriateness of an escapement goal of 49,000 upper Yukon chum salmon given the preseason outlook. No consensus was reached by the JTC on this point. U.S. members questioned whether this point was consistent with the agenda for this meeting. Canadian members noted that the rebuilding option chosen by the Yukon River Panel in November 1996 was entitled the “*fixed harvest rate target*”. In this option, the same percent of the rebuilding model production in 1997 and in 2001 would be allocated to harvest. The escapement goal of 49,000 that accompanied this option and was chosen by the Panel was based on the model output run size of 75,000 chum salmon. The model indicated that 26,000 chum salmon (35% of the run) could be harvested (Canada and U.S. combined). The JTC acknowledged at the November 1996 Panel meeting that the model did not take into account additional production that might occur from the 1992 brood year, nor did it take into account higher productivity that might be expected to occur given the low escapement in 1993. It was suggested to the Panel that this extra production, should it occur, should be viewed as a “bonus.”

At the February 1997 JTC meeting, it was not clear to Canadian JTC members whether the Panel would wish to revisit the 1997 upper Yukon chum salmon escapement goal of 49,000 fish given the preseason run outlook, which is 55% higher than the rebuilding model output provided in November 1996. Further, it was not clear whether Panel members would be more concerned about a fixed harvest rate applying in 1997 and 2001 or a fixed escapement goal applying for 1997.

The options identified by the Canadian members of the JTC for addressing these questions were:

- a) leaving the escapement goal fixed at 49,000 upper Yukon chum salmon in 1997, regardless of run size;
- b) leaving the harvest rate at 35% and revising the escapement goal and TAC according to the preseason run outlook rather than using the rebuilding model. A 35% harvest rate on a run size of 116,000 translates into an escapement goal of 75,400 and a TAC of 40,600 chum salmon;
- c) re-calculating the “fixed harvest rate” option using the preseason run outlook rather than using the rebuilding model, so that the same proportion of the runs in 1997 and 2001 are allocated to escapement. A preliminary estimate is that the recalculated escapement goal for 1997 would be 60,900 chum salmon for a run size of 116,000 fish.

3. should additional factors be considered in the development of final fishing plans? JTC comments about the proposed Canadian management plans for chinook and chum salmon were generally positive. It was questioned whether the idea of compensating Canadian fishers from the R&E Fund for not fishing chum had been considered. A proposal specific to this issue has not been submitted to, or reviewed by, the JTC R&E subcommittee. There is a R&E proposal that is being considered which includes a contingency plan for a limited number of Canadian fishers to be involved in stock assessment activities should the fishery be closed.

JTC comments about the preliminary management plan for chinook salmon in Alaska were likewise generally positive. However, there was concern expressed by Canadian members of the JTC about the preliminary U.S. fall chum management plan. Based on the total run outlook of approximately 750,000 fall chum (all stocks, drainage-wide) and the suggestion that the U.S. catch might total up to 304,000 fall chum (134,000 commercial and 170,000 subsistence), it was not clear to Canadian members of the JTC how the upper Yukon chum conservation concern would be/could be addressed adequately in 1997.

The preliminary U.S. harvest levels expected in 1997 imply that up to 41% of the overall run may be harvested by Alaskan fishers. Canadian members of the JTC felt that, given the mixed stock nature of the fall chum fishery, it is reasonable to expect the harvest will occur over an array of stocks, including upper Yukon chum, and to assume that the overall rate could be applied to that particular stock. U.S. members of the JTC noted delayed openings of the lower Yukon commercial fishery and subsistence fishing patterns which may invalidate such an assumption. Canadian members noted that delayed openings in the U.S. Yukon River fall chum fisheries have been in effect since 1982. Prior to 1994, the effectiveness of the delays in conserving upper Yukon River chum salmon stocks is questionable; the border escapement of chum salmon generally showed a declining trend during the 1983 to 1993 period. Since that time however, border escapements have increased markedly. Canadian members went on to note that if 41% of the upper Yukon run outlook of 116,000 chum is harvested in the U.S., the number of chum reaching the border (68,400 fish) would not be sufficient to fulfil the escapement (49,000 chum or updated as per point 2 above) and Canadian harvest (minimum of 23,600 chum) targets agreed to by the Panel. The U.S. section noted that the Alaska management plan is still in development and that Canadian comments will be taken into consideration. The Canadian section felt that further discussion by the Panel is needed to ensure the harvest and escapement objectives for the 1997 fall chum season are fully understood by the Parties.

4.0 CO-ORDINATED PROJECT PLANNING FOR 1997

The JTC discussed co-ordinated project planning, primarily in the areas of the upper Yukon River fall chum salmon tagging project and new stock identification research studies. A general description of what each of these projects will entail is given below.

4.1 Upper Yukon River Fall Chum Salmon Tagging Project

In April 1996, the Yukon River Panel endorsed plans for a mark-recapture and telemetry feasibility study for upper Yukon River fall chum salmon. The USFWS is the lead agency for the mark-recapture portion of the study, and the USFWS currently plans to conduct the mark-recapture study for the next three years. In 1996, 17,791 adult fall chum salmon were spaghetti-tagged at the Yukon River Rapids, 84 km upriver from the Yukon-Tanana River confluence. Recovery fish wheels operated 51 km upstream recaptured 44,999 chum salmon, of which 7.5%

were tagged. Data analysis is nearing completion for the mark-recapture study, and a project report should be available by May 1997. Based upon an interagency meeting on February 10-11, 1997, there was consensus among U.S. and Canadian management agencies that feasibility project objectives were accomplished and that the project should continue with minor refinements. No major revisions to the study plan were suggested by the team for 1997. The ADF&G has provided technical assistance to the project and may assist in mark-recapture operations in 1997 with BSFA as a co-operator, if funds are available.

The National Marine Fisheries Service is lead agency for the telemetry portion of the study. In 1996, two remote tracking stations were installed and tested; one station was located 11 km upriver from the tagging site in Alaska and the other was installed near the Fishing Branch River weir in the Yukon. Fifty fall chum salmon were tagged with radio transmitters equipped with motion sensors and activity monitors. Forty-eight radio tagged fish moved upriver after tagging, one was not located upriver after release, and one fish regurgitated its transmitter when recaptured at the tagging site. Results of the radio telemetry study are being summarised and will be available in a project report by June 1997. For 1997, installing additional tracking stations will be the major emphasis, with stations at the U.S./Canada border being the highest priority. Radio tagging of chum salmon is currently not planned for 1997 unless the U.S. Army can provide logistical support to install at least four tracking stations.

4.2 *Stock Identification Research Studies*

A three-year genetics study will be initiated by the USFWS in 1997 to complement the mark-recapture and telemetry study of upper Yukon River fall chum salmon. The genetics study will include genetic baseline improvement using DNA-based techniques and mixed stock analyses. Efforts for 1997 will focus entirely on baseline improvement. One of the major data gaps for managers has been the inability to identify fall chum salmon by country of origin. The genetics component will address this problem with tests of new genetic markers, expansion of the markers to more baseline stocks, and samples from additional stocks to improve the geographic coverage of the baseline. The work will be accomplished through collaborative efforts of USFWS, ADF&G, DFO, USGS-BRD, NMFS, and the private sector.

Development of a state-wide Alaska coho salmon genetic baseline will be initiated by the USFWS in 1997 and continue for at least three years. The goal of this project is to provide managers with a useful tool to address conservation, allocation, interception, and environmental issues by establishing a state-wide genetic baseline for coho salmon. The final product of this three-year effort is intended to permit an initial assessment of the extent and distribution of genetic variation for coho salmon in the state and provide a foundation from which to build the baseline in future years. The project comprises three primary components: 1) collections; 2) genetic marker testing; and 3) genetic marker application. Collections will be performed over the next two years, with replicate samples being taken from geographic regions throughout the state, including the Yukon River drainage. Sources of samples will include archival, opportunistic sampling, and targeted sampling. Non lethal sampling will be used to support the DNA-based methods that will be employed. Genetic marker testing will be performed on a subset of samples to identify markers that best characterise population substructuring within regions and between

regions. Once the useful markers are identified, they will be applied to the entire set of baseline samples. The work will be accomplished through collaborative efforts of USFWS, ADF&G, USGS-BRD, NMFS, universities, and the private sector.

5.0 STATUS OF PILOT STATION SONAR ON THE YUKON RIVER IN 1997

The draft plan (Attachment I) to rebuild the sonar program for salmon run assessment in the ADF&G Arctic-Yukon-Kuskokwim (AYK) region acknowledges the current status of that program and stipulates the minimum level of senior technical staffing required to maintain a functional, sustainable program. In 1996 and currently, the ADF&G AYK sonar program remains understaffed at senior levels. Attempts to rebuild the program will rely upon the ability to fill these positions in both the short term and long term. In the short term it means hiring one or both of the currently vacant regional sonar positions before the 1997 field season, and securing contract professional services from both the private and university sectors. In the long term it means developing a mechanism to create a continuing stream of trained professionals to fill vacancies. Toward that end, AYK region of ADF&G has become a proactive participant in the University of Alaska, Fairbanks attempt to establish a graduate curriculum in fisheries acoustics. It is expected the first graduate degrees will be conferred in two to three years.

At this point in time, ADF&G is pursuing all potential avenues to prepare for deployment and operation of the Yukon River sonar project at Pilot Station for management in the 1997 season. All planning and preseason logistic requirements are being fulfilled. However, the decision about operations has not yet been finalised, and no decision making deadline has been announced. If operations do occur, current planning calls for a normal schedule; mobilisation on about 25 May, first estimates from 3-5 June, and final estimates during the first week of September.

6.0 STATUS OF THE JTC TECHNICAL REVIEW OF RESTORATION AND ENHANCEMENT FUND PROPOSALS

6.1 Background

Paragraph 32(a) identifies the provision within the U.S./Canada *Interim Yukon River Salmon Agreement* (IYRSA) that a Restoration and Enhancement (R&E) Fund would be established and managed by the Yukon River Panel (Appendix I). Paragraph 32(c) identifies that the U.S. would provide an annual contribution to the R&E Fund beginning in 1995 (Appendix I). A “seed money” contribution of \$140K US was provided to the R&E Fund in 1995. The United States Legislation—*Title VII -- Yukon River Salmon Act*, provides for \$400K US to be deposited into

the R&E Fund for fiscal years 1996, 1997, 1998, and 1999 for use in restoring or enhancing Canadian chinook or fall chum salmon (Appendix I). Currently there is supposedly \$800K US in the Restoration and Enhancement Fund available to the Panel. These funds are the combined deposits from the U.S. Federal fiscal years FY96 and FY97.

Paragraph 38 of the IYRSA sets out the following priorities for use of the Fund: first, for restoring habitat and wild stocks; secondly, for enhancing habitat; and thirdly, for enhancing wild stocks. Additionally, the IYRSA, in paragraphs 33 and 39, also recognises and provides for planning to take place before restoration and enhancement projects are undertaken. Based on this provision, the JTC considers those proposals identified as being for planning and/or assessment to initially be the highest priority proposals.

Paragraphs 32 (b), 34, 41,42, and 43 of the IYRSA provided the primary references for the role of the JTC relative to the R&E Fund process (Appendix I).

The JTC R&E Subcommittee was created at the October 1996 JTC meeting in Whitehorse and the Panel was informed of this at the November 1996 meeting in Anchorage. The R&E Subcommittee consists of Russ Holder (U.S. co-Chair), Gail Faulkner (Canadian co-Chair), David Wiswar (U.S. representative), Sandy Johnston (Canadian representative), Paul Headlee (U.S. alternate), and Al von Finster (Canadian alternate).

A typical review schedule timeline was presented to, and approved by, the Panel at the meeting in November 1996. Also approved was a modified date timeline for the 1996/97 review schedule which deviated from the typical timeline in order to accommodate the compressed schedule this past year due to the delayed closing dates for the acceptance of proposals.

6.2 Summary of JTC Technical Review Activities

On 4 December 1996, the JTC R&E subcommittee met via teleconference the entire day to discuss and finalise the review process and timelines for proposals. It was agreed that individual proposals would be identified by either “CRE-*number-97*” or “URE-*number-97*” with the “C” representing Canadian-origin proposals and “U” for United States. The middle number typically corresponded to the order in which proposals were received by the Panel co-chairs, and “97” represented the year in which the proposal would be considered for funding. Lead subcommittee reviewers were identified for each proposal and additional independent reviewers were suggested.

Beginning 10 December 1996, independent reviewers were solicited and they were requested to complete their reviews and return them to the lead reviewer by 10 January 1997. On average, each proposal received three professional technical reviews by JTC members and/or other professionals.

From 10 January 1997 to 25 January 1997, the lead reviewers were responsible for compiling their own and the other technical reviews into a draft comprehensive technical review for consideration by the R&E Subcommittee. It typically took lead reviewers four hours to compile each draft review for the subcommittee group.

The R&E Subcommittee of the JTC met in Whitehorse from 27 through 31 January 1997 to finalise the technical reviews. Each proposal took the subcommittee an average one and a half hours to review and to finalise the review form and an additional hour per proposal to finalise and standardise the form format, spell check, add footnotes, and ensure page breaks occurred appropriately.

The JTC R&E subcommittee provided the finalised review comment sheets to the Panel co-Chairs on 31 January 1997.

6.3 Results and Discussion

Of the 33 proposals reviewed, the JTC R&E Subcommittee recommended 25 proposals for funding consideration. It recommended that 7 proposals not be funded, and deferred recommendation on one proposal pending resolution of negotiations between DFO Habitat and the City of Whitehorse. The total value of the projects recommended for funding is \$757,112US based on a conversion of Canadian project funds to U.S. funds at \$0.74. In addition, the value of the deferred project, CRE-23-97, that might be considered for funding is approximately \$19,580US and there was one project, CRE-22-97, that the sub-committee and technical reviewers felt was under-budgeted - an additional \$12,655US was recommended for consideration for this project. Accounting for these two additional projects brings the total to \$789,347US. Although there is supposedly \$800,000US available in the R&E Fund, the JTC would like to remind the Panel that should they obligate all \$800,000 dollars this season, there will only be \$400,000 dollars for next year to fund both new projects, and second year funding for multi-year projects approved this year.

Estimating the total time involved for each review step, professional agency staff put in at least 733 hours overall or approximately 22 hours per proposal in the various activities associated with reviewing these proposals.

Comments on the use of the review form: Items 1, 2, and 3 of Part 1 of the Proposal Review Form are criteria which are to be addressed in Comprehensive Salmon Planning as provided in the IYRSA, paragraphs 33 and 39. Neither the U.S. nor Canada has completed comprehensive salmon planning as provided for in the IYRSA, but each country is in the process of developing their own independent plans which are to include sub-basin priorities, may evaluate habitat capacities for salmon, and attempt to identify rebuilding or restoration potential. Although these criteria have been listed on the front page of the proposal review form, these items are answered as unknown or not applicable since the Comprehensive Salmon Planning documents have not yet been completed.

The JTC R&E Subcommittee realised that it might be difficult for the Panel to determine the recommendation of the JTC unless it was explicitly stated on the review form. Recognising this, a section at the beginning of the Proposal Review Form entitled the *JTC Recommendation* was added. Within this section, the proposal was either recommended for funding, or not recommended for funding. If it was recommended for funding, any major concerns were

identified and usually covered in a list of conditions attached to the recommendation for the applicant to address.

Comments on the quality of proposals: Nearly all the reviewers were disappointed in the quality of the submitted proposals. Even though the submission deadline resulted in hastily developed proposals, it was extremely difficult to evaluate the proposals on their technical merit without the technical components being better described. For example, a number of the proposals included water sampling: the purpose for collecting the water samples was not identified, the proposed sampling schedule was usually lacking, the specific water quality tests to be documented were usually not described, and the proposed number of sampling sites and their locations within the study area was missing. The reviewers tried to address proposal deficiencies by asking appropriate questions in the review sheets.

Most proposals were seriously lacking in supporting information or references which could have clarified many issues which the JTC tried to address in comments or conditions. Trying to technically review proposals submitted by consultants, groups, or individuals, with varying levels of experience in fisheries restoration and enhancement was very difficult.

Some of the proposals were so technically deficient that they should never have been accepted for technical review. They should have been returned to the applicant with a letter describing the deficient areas which needed to be improved prior to acceptance. Unfortunately, there was no one to fulfil that screening responsibility this year. It is hoped that the new Executive Secretary can facilitate future communication by initially reviewing submitted proposals and identifying any significant concerns which the applicant could address prior to the proposal acceptance deadline.

It is hoped that proposal applicants used the public comment period this year to address or clarify issues of concern in their proposals which the JTC raised in our technical reviews.

Items for Panel consideration: Items which should be considered and discussed by the Panel at their March meeting in Whitehorse include: U.S. versus Canadian dollars; monitoring and distribution of funds to successful proposers; reporting requirements and repository for reports; funding of programs versus projects; and the question of who should be submitting proposals.

The Panel will also need to develop the guidelines and criteria for distribution and monitoring of funds to be distributed to successful proposal applicants. Are successful applicants going to receive lump sum payments? Is there going to be a reimbursement system? Who is going to be responsible for dispersing these funds and auditing the projects?

Panel members will also need to develop project reporting requirements and determine who will receive them and where the reports will be archived. Are there going to be progress reporting requirements? Is an annual report required or a project completion report? Who is to receive the reports and determine their acceptability?

In all likelihood, the answers to these questions on funding and reporting requirements will be dependent on the individual projects—which means there will be a confusing amount of information to keep track of. Most, if not all of these items, should seriously be considered as job responsibilities of the Executive Secretary.

The question of funding programs versus projects has been raised. Some proposals were requesting funding to support, or supplement, existing programs. This is somewhat of a philosophical issue on what the R&E Fund should be paying for. Should the Fund be paying for all, or part of, a recurring activity of a significant scale whose usefulness may be only fully realised over a long period of time? Or should the Fund focus on projects which are of a much smaller scale and whose value can usually be evaluated much sooner? It can be argued that program activities should be borne by responsible management agencies or those who initiated the program in the first place, but it also could be argued that the most useful information and/or results would be from larger, longer term programs, whose current level of funding is inadequate.

Who should be submitting proposals? This year government agencies familiar with the Interim Agreement stayed out of the R&E proposal submission process. It was confusing to some as to who should or should not be submitting proposals. It had been hoped by some that R&E funds would allow the opportunity for significant research on topics which have been begging attention. Some types of work may be best suited for government agencies to perform. The JTC would recommend that it be explicitly defined who should or should not apply for using R&E Funds.

7.0 STATUS OF THE STOCK IDENTIFICATION DISCUSSION PAPER

Each method of stock identification that has been used on the Yukon River was assigned to an individual with expertise in that method to write a section for the paper. Their first draft was received and compiled in early February. This first draft was too long and had little consistency between sections in either format or degree of detail. It was decided that the report needed serious revision. A standard format and level of detail were agreed upon and new drafts are to be submitted in early May to the appointed editor for compilation. It is expected that a working draft will be ready for review by late May, and that the final report will be ready for the fall round of the JTC and Panel meetings.

APPENDIX I

The following are selected text citations from the Interim Yukon River Salmon Agreement and from U.S. implementing Legislation relevant to the discussion in Section 6 of this report regarding the Restoration and Enhancement Fund.

Interim Yukon River Salmon Agreement

Paragraph 32(a) - there shall be established a Yukon River Salmon Restoration and enhancement Fund, hereinafter referred to as “the Fund”, to be managed by the Yukon River Panel;

Paragraph 32(b) - the fund shall be used for programs and directly associated research and management activities on either side of the border which are based on recommendations by the JTC and are directed at the restoration and enhancement of Canadian origin salmon stocks;

Paragraph 32(c) - the United States shall provide annually to the Fund by December 31 of each year beginning in 1995 a financial contribution, subject to the availability of appropriated funds. In the event that the annual contribution is not made this agreement shall be suspended until the contribution for that year is made;

Paragraph 34 - The Parties understand that the financial contributions to the Fund shall be used for the programs described in Paragraph 32 (b) to provide benefits for U.S. and Canadian fishermen on the Yukon River.

Paragraph 41 - The JTC shall develop a standard proposal format and implement a procedure for reviewing project proposals for use of the Fund. The JTC shall also develop and implement standard procedures for evaluating proposals for use of the Fund. When appropriate, the JTC will provide an evaluation of the ecological and genetic risks, the socio-economic impacts, and will identify alternative actions including but not restricted to fishery management actions. The JTC shall establish levels for restored stocks consistent with natural habitat capacity.

Paragraph 42 - Following JTC evaluation of proposed projects, each Party shall provide an opportunity for public comment and review of the proposed projects, along with the JTC evaluation.

Paragraph 43 - The Yukon River Panel shall then decide which projects to fund, based on these guidelines, the JTC evaluation and any public comments received.

United States Legislation:

Title VII—Yukon River Salmon Act

Section 710, Paragraph (4) -- \$400,000 in each fiscal year 1996, 1997, 1998, and 1999 to be contributed to the Yukon River Restoration and Enhancement Fund and used in accordance with the Agreement.

ATTACHMENT I

A Rebuilding Plan for the Sonar Program for Salmon Run Abundance Assessment in the AYK Region. Alaska Department of Fish and Game Commercial Fisheries Management and Development. Draft dated 6 February, 1997.

DRAFT (2-6-97 tmk)

A REBUILDING PLAN FOR THE SONAR PROGRAM FOR SALMON RUN ABUNDANCE ASSESSMENT IN THE AYK REGION

ALASKA DEPARTMENT OF FISH AND GAME COMMERCIAL FISHERIES MANAGEMENT AND DEVELOPMENT

The sonar program for salmon run assessment in the Arctic-Yukon-Kuskokwim (AYK) Region is understaffed. We must rebuild technical expertise to help ensure successful operations and build in the appropriate level of depth to minimize the effect of staff turnover on the operation of important sonar assessment projects.

We have both user-configurable sonar projects and non-configurable (Bendix) sonar projects in the AYK Region. These sonar projects are important to salmon fishery management in the Region. User-configurable sonar is used predominately on larger rivers in the AYK Region and a team of sonar project staff operate these more complicated sonar applications. Specifically, this equipment is used at the Pilot Station, Kuskokwim, Noatak and Aniak project sites. The Yukon, Kuskokwim and Noatak Rivers are very large river systems; the Aniak River is a tributary and is smaller in size. On large rivers such as the Yukon, Kuskokwim and Noatak, there are no viable alternative methods for direct inseason assessment of the number of salmon moving upstream on a timely basis. We currently operate Bendix sonar projects on the Anvik, Sheenjek, and Toklat Rivers. Bendix sonar equipment is more simple to operate but has a limited range and is insufficient for large river systems. Bendix sonar projects have been the responsibility of area staff with some technical support from equipment designer and builder Al Menin and from sonar program staff.

Because of ever increasing demands for precision in the management of the salmon resources, we have made a commitment to rebuild the sonar program in the AYK Region as soon as possible. The ultimate goal is to simultaneously operate the Aniak, Pilot Station, Kuskokwim, Noatak, Anvik, Sheenjek and Toklat River projects at a level of technical reliability commensurate with the importance of these resources and the management decisions made based on the data these projects provide. Projects will be operated as well as possible with quality control checks in place to monitor for problems which surface.

This rebuilding effort will be a two phase process; the first achieved by reconstituting sonar technical staffing to appropriate levels, and the second by creating a pool of acoustically and electronically skilled persons from which to recruit for both technical/supervisory and project staffing. In order to operate all four user-configurable sonar assessment projects simultaneously three technical/supervisory positions are needed to oversee these projects. Currently, only one of these three staff positions is filled (see attached organizational chart). We are searching for a person to fill the AYK Regional Sonar Program Supervisor position at the present time and hope to restore the program to the full complement of 3 technical/supervisory positions as soon as possible. At this initial stage in the rebuilding process, it is necessary to fill staffing vacancies from the top down and continue to develop expertise within existing project staff for the future.

Access to a pool of skilled sonar staff is imperative. To date, much of the professional training for sonar program staff has been provided 'on the job'. As the second of two essential elements of this rebuilding process, we have become a proactive participant in the University of Alaska, Fairbanks (UAF) campus' efforts to establish a graduate curriculum in Fisheries Hydroacoustics. In cooperation with UAF and other institutions we hope to bring in broader technical resources with hydroacoustics expertise; we view that this will be necessary to address technical issues associated with the AYK sonar program. We hope the first UAF graduate degrees will be conferred in the next two to three years. AYK will continue to actively support the University's efforts to produce trained fisheries sonar specialists as part of the long-term sonar program rebuilding process and will seek to establish a fisheries hydroacoustics job class series as an avenue to more directly access personnel with needed electronic and fishery hydroacoustic experience.

To be effective, it will be necessary to implement this rebuilding process according to a measured time-line determined by demonstrated regional sonar program capability and fishery management data needs. The AYK sonar program will continue to employ the team approach to program and project operations, and it will require meeting both short term and long term objectives to be successful. The following time-line will necessarily be modified if we encounter difficulties in conducting project operations according to existing operational plans or in attaining target staffing levels. In addition, staff turnover during the rebuilding process may extend the time frame. The time-line will necessarily be updated annually.

Short Term Objectives required to achieve the first phase of the rebuilding program:

1) It is critical that two positions be filled as soon as possible to achieve the minimum requisite

depth of three technical/supervisory positions needed to sustain the program over the long term. The positions which need to be filled are the AYK Regional Salmon Sonar Program Supervisor position and an FB-III level sonar technical position.

- 2) Sonar staff are acquiring additional formal academic training to augment existing skills.
- 3) Sonar staff are working to acquire additional support from the University of Alaska, contractors and perhaps other resources.
- 4) We will keep department staff and the public informed on the status of efforts to rebuild the sonar program within the AYK Region.

Long Term Objectives required to achieve the second phase of the rebuilding program:

- 1) Sonar staff will continue to work with UAF to develop a graduate Fisheries Hydroacoustics curriculum to establish a pool of professionals skilled in sonar operations.
- 2) Sonar Staff will continue to acquire additional sonar training on new advancements and support from contractors.
- 3) We will continue to keep department staff and the public informed on the status of efforts to rebuild the sonar program within the AYK Region.

1996 Field Season Recap:

Staff:

- 1-Operations Sonar Biologist
- 3-Project Leaders (2 with no previous user-configurable sonar experience, 1 with one field season of experience).

Projects:

- Aniak: Operational for management using user configurable equipment
- Yukon: Operational for training purposes only
- Noatak: No Operations
- Kuskokwim: No Operation

1997 Field Season Plan:

Staff:

- 1-AYK Regional Sonar Program Supervisor
- 1-Operations Sonar Biologist
- 3-Project Leaders (2 with 1 season's experience and 1 with 2 season's experience)

Projects:

- Aniak: Operational for management
- Yukon: Operational for management
- Noatak: No Operations
- Kuskokwim: No Operations

Our three FB-II level Project leaders and their staff are being encouraged to obtain additional sonar related academic training as part of the regional sonar program rebuilding process. During the sonar program rebuilding phase, our Project Leaders will be cross-trained in a variety of tasks in support of the sonar program effort and area management and research programs. The intent is to enhance the capabilities of project staff in user-configurable sonar application and to support area management and research needs. For example, in 1997 when it will not be possible to operate the Noatak River sonar project, that project leader will assist with operations at the Pilot Station and Aniak sonar projects and in addition will assist at the Anvik River as well as with Norton Sound herring and king crab fishery management and research. Over the long term, it will also be important that technical/supervisory staff are cross-trained such that staff turn over or unexpected events affecting staff will not have a dramatic impact on important sonar assessment project operations.

For the 1998 field season and beyond, the plan is to continue to operate the Aniak and Pilot Station projects to provide management level data. Noatak and Kuskokwim projects will be brought back on line as soon as possible. The Noatak River sonar site is very stable and the sonar application there is comparatively simple; as such, it is likely that the redevelopment of this project can occur quickly. It is likely that the Noatak project can provide management level data the first season we

resume operations. By contrast, we know from our ongoing monitoring that the river bottom at the Kuskokwim River sonar site is shifting and that it may very well be necessary to relocate that project to a new site. In addition, the Kuskokwim River sonar project is technically more challenging. For these reasons we anticipate that it will take an additional one to two years of redevelopment/training before it will be possible to operate the Kuskokwim River sonar project for management. It would not be prudent to begin redevelopment/training for the Noatak and Kuskokwim projects in the same year. As such, we will need to make a decision in the winter of 1997-1998 concerning which of these two projects we will reinitiate during the 1998 field season. It is likely that it will not be possible to reestablish the full complement of user-configurable sonar projects (Aniak, Pilot Station, Kuskokwim, and Noatak) for management until the summer of 2000. To the extent that we encounter problems acquiring the needed technical expertise in a timely fashion, this time-line will be delayed.

We expect that beginning in 1999, graduates from the University of Alaska Fisheries Hydroacoustics program will be available for consideration as candidates for job openings within the AYK sonar program. It will be important to rebuild expertise within the AYK sonar program as soon as possible to reestablish depth within the ranks such that field programs can be maintained long term without interruption.

The division is currently looking at replacement options for the Bendix sonar equipment. While we do not know what the final outcome of this process will be, it is clear that regional sonar program staff will continue to be called upon to assist at these sites. On behalf of the AYK Region, sonar program staff will continue to be key in the decision process for Bendix sonar replacement and the transition to the next generation of salmon run assessment sonar equipment for small to medium sized river systems.

When the sonar projects have been reestablished at Pilot Station, Kuskokwim and Noatak we will have the opportunity to consider salmon run assessment challenges in other areas of the region as well e.g. Tanana, Koyukuk, Porcupine, Kobuk, Eagle.

AYK REGION SONAR PROGRAM

