

Yukon River Inseason Salmon Harvest Interviews, 2006

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Abstract

Subsistence salmon harvest information collected during the fishing season is an important management tool for Yukon River fishery managers. Information gauging the progress towards subsistence salmon harvest goals, fishing conditions, and quality of subsistence catch were collected in 2006. Local village interviewers contacted a subsample of fishermen each week to evaluate progress towards meeting subsistence harvest goals. Ninety-three households were interviewed weekly between May 31 and August 6, 2006 in the Alaska villages of Emmonak, Marshall, Holy Cross, Kaltag, Huslia, Galena, and Beaver. A combined total of 345 interviews was conducted during the Chinook salmon *Oncorhynchus tshawytscha* and summer chum salmon *O. keta* fishing season. Information was reported during 14 weekly public Yukon River Drainage Fisheries Association teleconferences, distributed in eight weekly written summaries, and used in six federal inseason memorandums of concurrence management reports. In general, inseason interview data indicated that the largest change in subsistence harvest goal progression for lower Yukon River communities, expressed as a harvest percentage increase, occurred around the first quarter point of the Chinook salmon run when the first pulse was present. Conversely, upper Yukon River communities reported the largest change occurred when the second pulse was present, near the midpoint of the Chinook salmon run. Summer chum salmon harvest progression was largest around the quarter-point of the run. Excluding the village of Huslia, subsistence harvest goals for Chinook and summer chum salmon were met or nearly met for the 2006 fishing season.

Introduction

Chinook *Oncorhynchus tshawytscha* and chum *O. keta* salmon spawn in rivers located in the Yukon Delta, Koyukuk, Nowitna, Innoko, Kanuti, Arctic, and Yukon Flats National Wildlife Refuges (Figure 1). The Yukon River is approximately 2,000 miles in length, of which 1,200 miles are located in Alaska and the remainder is in Canada (Kammerer 1990).

Adult Chinook and summer chum salmon are important species for subsistence, commercial, sport, and personal use fishermen on the Yukon River. Yukon River salmon return to their natal breeding grounds to spawn beginning in early summer and ending in late fall. Chinook salmon migrate in the Yukon River from the latter part of May or early in June through mid-July, although stragglers can appear as late as August (Gilbert 1921). Chinook salmon spawn throughout the Yukon River drainage with some spawning grounds located over 1,900 miles from the Bering Sea (Healey 1991). Summer chum salmon enter the Yukon River in early June and spawn primarily in tributaries in the lower and middle river reaches (the mouth of the Yukon River to the Tanana River drainage), (ADF&G 2002). Returning adult salmon are harvested in subsistence, personal use, commercial and sport fisheries in Alaska and in aboriginal and domestic fisheries in Canada (Dubois 2005).

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Postseason surveys have been conducted annually on the Yukon River by ADF&G Commercial Fish Division since 1961 in order to estimate subsistence salmon harvest levels, evaluate management actions postseason, and to detect and quantify shifts in harvest patterns and amounts (Borba and Hamner 2001). In 2006, an estimated 53,100 Chinook and, 82,500 summer chum salmon were harvested in the subsistence fishery (Bue and Hayes 2006). The ten-year (1996-2005) average subsistence harvest was estimated to be 50,000 Chinook and 77,000 summer chum salmon (JTC 2006). However this information is typically only available postseason and therefore not used for inseason management. The 2006 preseason management outlook predicted a below average Chinook salmon run and an average summer chum salmon run (JTC 2006). The State of Alaska Yukon River management determination lists Chinook salmon as a stock of yield concern (Hayes et al 2006) while summer chum salmon have no designation (Clark et al. 2006).

Managing mixed stocks and overlapping species with compressed or similar entry time into the Yukon River which are harvested using different gear types (set gill nets, drift gill nets, and fishwheels) with variable catch efficiencies is a complex task. Numerous projects located throughout the river are used to evaluate inseason salmon run-timing and run-strength. These projects include test-net and fishwheel index fisheries, sonar, genetics, aerial counts, weir and tower counts, salmon age assessment based on scales, and past projects that included radio-telemetry. All of these projects target quantitative data collection specific to escapement and run assessment and do not assess progress towards meeting subsistence harvest goals. Inseason interviews were implemented to meet the mandate set forth in the Alaska Native Interest Lands Conservation Act (ANILCA), which requires a priority for subsistence over other consumptive uses.

The goal of the inseason interview project is to collect and summarize inseason subsistence salmon harvest information for use in inseason management decisions. The information provides fisheries managers' comparative harvest indices, an additional salmon run evaluation tool, and promotes and diversifies feedback from subsistence fishermen throughout the river. The communities selected to participate in the study were chosen due to their proximity to federal conservation system units and the presence of a dedicated interviewer. Interview collection and summary techniques are based on a methodology developed in 2003 (Gerken and Holder 2005). The project was funded by the Office of Subsistence Management, Fisheries Resource Monitoring Program.

The 2006 project objectives included:

1. Facilitate inseason subsistence salmon interviews by local residents from early June to mid August in seven Yukon River communities (Emmonak, Marshall, Holy Cross, Kaltag, Galena, Huslia, and Beaver).
2. Document subsistence harvest information in a standardized format from at least five active fishing households per village. Provide a summary of subsistence fishing to fisheries managers by Monday noon of each week for inclusion in inseason fisheries management decision-making.
3. Promote/support local governments and or tribal organizations in developing their natural resource capabilities and programs.
4. Identify new local interviewers and encourage their participation in the preseason training program.

Methods

Data Collection

Local residents were chosen as interviewers based on their in-depth knowledge about their community and local fishing activities. Interviewers were employed either by the United States Fish and Wildlife Service (USFWS) National Wildlife Refuge system as a refuge information technician (RIT) or hired through contracts issued by the Yukon River Drainage Fisheries Association (YRDFA). Interviews with subsistence fishermen in Emmonak, Kaltag, Huslia, and Galena were conducted by YRDFA local hires. RITs performed interviews in Marshall, Holy Cross, and Beaver (Figure 1). USFWS personnel trained new interviewers in their village on an individual basis and consulted with experienced interviewers via telephone and during other Yukon River meetings. The villages mentioned above were chosen because they are located near federal conservation system units where federal management jurisdiction exists.

Before the fishing season, interviewers contacted households either in person or by telephone to explain the project, determine if members of the household were willing to participate in the project, and gain their consent to be interviewed. Household lists from the ADF&G postseason subsistence surveys were used to identify potential interview contacts. Information from the ADF&G postseason surveys categorized households into unique strata dependent upon their degree of harvest during the prior five fishing seasons. These harvest strata were: Unknown, Do Not Fish, Light (1-200 salmon), Medium (201-500 salmon), or Heavy (> 500 salmon) harvester (Brase and Hamner 2003). Households interviewed for this project were categorized in the heavy and medium harvest strata. The assumption guiding this selection was that households in the medium and heavy harvest strata fished longer and more frequently and would provide greater consistency in weekly subsistence fishing input.

Interviews¹ were conducted weekly from June through August with a minimum representative sample of five subsistence fishing households per village. Actual timing of interviews was dependent on when salmon were present. Interviews were conducted near the end of, or after, fishing period(s) as dictated by the regulatory subsistence fishing schedule. Interviewers collected information on: 1) fishing gear used; 2) relative comparison to the 2005 season catch rate (“better”, “same”, “poor”) and amount of time fished (“more”, “equal”, “less”); 3) the harvest goal progress (expressed as a percentage in 25% increments) that households were making toward completing their subsistence harvest; 4) and general comments from fishermen related to the salmon run.

Interviewers summarized the results and provided the information to the USFWS project leader. The project leader compiled the weekly subsistence information from all villages and distributed written weekly summaries to managers and the public. Verbal summaries for each village describing fishing conditions and subsistence harvest progress were presented by interviewers on weekly public YRDFA teleconferences. Household specific interview information is confidential and no information was released to the general public that could identify an individual household.

¹ For the purposes of this study, an interview was defined as “a meeting between an interviewer and a representative of a subsistence fishing household where information was obtained and documented by the interviewer.”

Data Analysis

In order to evaluate subsistence harvest progression during the fishing season, a weekly average percentage for a village was denoted in a weekly harvest summary (Appendix A). This percentage was calculated using all household responses to the question “where are you at in your harvest (%)?” during an interview week. As the fishing season progressed, household subsistence salmon harvest goals were completed. Once a household reported a 100% completion, it was considered to have met its harvest goal and was no longer interviewed. A household reporting 100% completion was included in following weekly averages as 100%. The weekly average percentage tracks harvest progression by village during the fishing season, therefore all households interviewed or reporting 100% completion are included in the weekly average. In some instances, the weekly average percentage decreased between interview weeks because the number of households interviewed changes. The primary reason for this decrease was that a household representative was unavailable when interviewers contacted the household. If the household representative was accessible for another interview in the same interview week then the household was contacted again, however, many of the interviewed households are located in fishcamps thus decreasing the likelihood for a second contact in one interview week.

Estimation of village harvest goal completion after the fishing season is reported as a final percentage in the village summaries below. The final percentage was the weighted average of all interviewed households during the 2006 fishing season occurring on the last interview week. This final percentage represents the level of success that a village achieved towards their subsistence salmon harvest goals. This percentage was weighted by the number of interviews per household. For example, a household interviewed twice has a lower weight in the final percentage than a household that had ten interviews. Maintaining a consistent weekly household interview list was not always possible and some households were interviewed at a higher frequency than others. When a household could not be contacted, its subsistence harvest progression could not be interpreted. As a result, this analysis assumes that a household which was consistently interviewed throughout the fishing season represents subsistence harvest progression more accurately than a household that was interviewed sporadically.

Salmon run-timing occurring for a village was estimated using the length of the run in relation to the ADF&G lower Yukon River set net project for Chinook salmon and the ADF&G Pilot Station sonar counts for summer chum salmon. Dates for each village were expanded using a daily swimming rate of 37 miles/day for Chinook salmon and 18 miles/day for summer chum salmon (T. Spencer, pers. comm.). Radio-telemetry used to identify Chinook salmon movement patterns on the Yukon River indicated that radio-tagged fish traveled an average of 31 miles/day in 2003 (Eiler et. al. 2006), while Chinook salmon captured in the Ramparts Rapids fishwheel project traveled at 41 miles/day in relation to the ADF&G lower Yukon test net project in 2005 (Zuray 2005). Inseason analysis indicated that Chinook salmon were traveling 37 miles/day in 2006. This information is used to estimate the migration run-timing and pulse-timing dates for villages in participating in this project.

Results

A combined total of 345 interviews was conducted in the villages of Emmonak, Marshall, Holy Cross, Kaltag, Huslia, Galena, and Beaver during the 2006 Chinook and summer chum salmon fishing season. Subsistence harvest information for summer chum salmon was collected in Emmonak, Marshall, and Huslia, but this information was limited due to a low number of

interviews. Interviews for both species were conducted between June 4 and August 6, 2006. The number of weeks that interviews were conducted ranged from 3 to 10. The number of households interviewed weekly ranged from 4 to 18 (Table 1). Nearly all fishing households categorized in medium or heavy harvest strata were interviewed. The lowest percentage interviewed as compared to the total fishing population in a village was 14% while the highest was 50% (Table 2). Data were summarized and presented in both written and verbal formats. The subsistence interview information was distributed in eight written weekly updates provided to fishery managers and interviewers, USFWS (Emmonak/Fairbanks), Emmonak Tribal Council, ADF&G Commercial and Subsistence Divisions, YR DFA, Louden Tribal Council; Ohogamiut Tribal Council, Yukon Flats, Innoko, Yukon Delta, Koyukuk/Nowitna NWR's, local RAC and CFC members, and USFWS/Office of Subsistence Management (Anchorage). Weekly information was presented verbally on all 14 YR DFA teleconferences occurring in 2006 (Table 3).

2006 Catch Rates and Fishing Time

Information regarding catch rates and fishing time was used to evaluate if subsistence fishermen were changing their fishing practices as compared to 2005. Information was collected between June 11 and July 23, 2006. A total of 181 responses detailing catch rates and 191 responses comparing the amount of time fished in 2006 to 2005 during the Chinook salmon fishing season was provided by households. Differences in the total number of responses were a result of fishermen declining to comment or an incomplete interview. The majority of households indicated that they spent less time fishing than in 2005, but there was no dominant category regarding catch rates (Table 4).

Interviews pertaining to summer chum were provided by households in Emmonak, Marshall, and Huslia between June 11 and July 30, 2006. A total of 73 responses regarding catch rates was collected from households during the summer chum salmon fishing season and 70 responses referred to the amount of time fished. In general, households indicated that catch rates for summer chum salmon were better in Emmonak as compared to the 2005 fishing season and poor in Marshall and Huslia as compared to 2005. All villages spent less time fishing compared to the 2005 fishing season (Table 5).

Village Harvest Progression

Inseason subsistence salmon harvest information is a valuable inseason evaluation tool. However, in order to estimate salmon harvest goal completion, managers need to compare the information with salmon run-timing. The timing of the quarter-point, midpoint, or three-quarter point of a particular salmon run is generally unknown until the run is completed, so comparisons of run-timing inseason typically involve historical averages. The historical run-timing (1989-2005) of these quartile points in the lower river for Chinook salmon, indicated by the ADF&G lower Yukon River test fishery are June 15, June 20, and June 26. Historical summer chum salmon quartile points (1986-1991, 1993-1995, and 1997-2005) in the lower river are based on the ADF&G Pilot Station sonar project and occur on June 22, June 28, and July 4. If subsistence harvest progression tracked exactly with historical run-timing, then managers would expect a village to have harvested 25% on the quarter point, 50% on the midpoint, and 75% on three-quarter point. In the following discussions of individual villages, the historical run-timing points, marked with (-) have been noted and are indicative of the information managers used inseason. Additionally, the actual 2006 run-timing points have been marked to recapture the

timing of subsistence harvest progression throughout the salmon run. Depicting subsistence salmon harvest progression in each village using a weekly increase provides insight on which salmon pulses are contributing to subsistence salmon harvest goals in a village. Specific to Chinook salmon, pulses were observed in the ADF&G lower Yukon River test fishery on June 15, June 23, and June 28, 2006. The run-timing and pulse-timing dates for other villages participating in this project were estimated using the migration timing noted in the methods section.

Emmonak

Harvests occurred between June 4 and July 16, 2006. Seven to 18 households were interviewed weekly. Emmonak area fishermen reported completing over half (56%) of their Chinook salmon subsistence harvest goals prior to the quarter point of the run occurring on June 20, 2006. These harvests consisted of Chinook salmon traveling in the first pulse. The next largest increase in subsistence harvest progression (28%) occurred between June 18 and June 23, 2006 when the second pulse passed through the Emmonak area. This harvest occurred before the midpoint of the Chinook salmon run in Emmonak. A comparison of subsistence harvest progression to historical run-timing indicated that Chinook salmon harvest goals were completed ahead of quartile points (Figure 2). The final percentage for Chinook salmon harvest from all interviewed households was 92% occurring on July 16, 2006.

A comparison of harvest progression for summer chum salmon to the 2006 run-timing was 58% around the quarter point, 81% around the midpoint, and 97% after the three-quarter point of the run. Comparing subsistence harvest progression to historical run-timing indicated that summer chum salmon harvests were being completed ahead of quartile points (Figure 3). The final percentage for summer chum salmon from all interviewed households was 91% occurring on July 16, 2006.

Marshall

Interviews were conducted during the weeks of June 11, June 18, and July 16, 2006. During the first two interview weeks, the reported harvest percentage for Chinook salmon was 0% and 5%. Approximately one month later the harvest percentage was 75%. For summer chum salmon the harvest percentage was 0%, 15%, and 50%, for the above dates, respectively. Due to the absence of interviews between June 18 and July 16, 2006, the period incorporating the quarter point, midpoint, and three-quarter point of the Chinook and summer chum salmon runs, no harvest progression could be interpreted.

Holy Cross

Harvests occurred between June 11 and July 9, 2006. Ten to 15 households were interviewed weekly. Fishermen in Holy Cross completed almost half (47%) of their Chinook salmon subsistence harvest goals prior to the run quarter-point in their village on June 28, 2006. This increase in harvest progression occurred when the first pulse of the Chinook salmon run passed through their area on June 26, 2006. Prior to the midpoint of the run on July 4, 2006, there was a 46% increase in harvest. This increase occurred when the second pulse of the Chinook salmon run passed their area beginning on June 28, 2006. A comparison of harvest progression to historical run-timing indicated that Holy Cross fishermen completed their harvest goals ahead of quartile points (Figure 4). The final percentage for Chinook salmon harvest from all interviewed households was 94% occurring on July 9, 2006.

Kaltag

Harvests occurred between June 25 and July 30, 2006. Six to seven households were interviewed weekly. The first pulse of the Chinook salmon run passed Kaltag on June 26, 2006 with a small increase in harvest progression. The quarter-point of the run was on July 2, 2006. The largest weekly increase (34%) in harvest progression for Chinook salmon occurred July 2 - 9, 2006 when the second pulse was present on July 4, 2006. Two similar weekly increases in harvest progression, 26% and 21%, occurred on July 9 - 16, 2006 and July 23 - 30, 2006, respectively. The first increase occurred around the entry of the third pulse into the Kaltag area on July 9, 2006. The second increase occurred on the tail of the Chinook salmon run. A comparison of harvest progression to historical run-timing quartile points indicated that Kaltag fishermen harvests were minimal around the quarter point, but comparable around the midpoint and three-quarter point (Figure 5). Fishermen commented that high water forced them to fish further out from the beach where Chinook salmon were swimming. The final percentage for Chinook salmon harvest from all interviewed households was 92% occurring on July 30, 2006.

Huslia

Harvests occurred between June 18 and July 23, 2006. Four to six households were interviewed weekly. Harvest progression increases were similar throughout the Chinook salmon run. Huslia area fishermen reported 19% completion with harvest goals from July 2 - 9, 2006, when the first pulse was present on July 3, 2006. They reported a harvest increase of 18% between July 9 and July 16 when the second pulse was present on July 11, 2006 and a harvest increase of 16% from July 16 - 23, 2006 when the third pulse was present on July 16, 2006. These increases tracked with the Chinook salmon run-timing in the Huslia area, at the quarter-point of the run on July 9, 2006 the reported harvest progression was 37% and near the midpoint of the run the reported harvest progression was 53%. Huslia area fishermen reported poor fishing conditions due to high water and large amounts of debris between July 9 and July 23, 2006. No increases in harvest progression occurred after July 23, 2006 because fishermen primarily targeted summer chum salmon until August 6, 2006. A comparison of harvest progression to historical run-timing indicated that harvests were comparable near the quarter-point and midpoint, but minimal around the three-quarter point (Figure 6). The final percentage for Chinook salmon harvest from all interviewed households was 48% occurring on July 23, 2006.

Summer chum salmon subsistence harvests occurred between July 2 and August 6, 2006. Comparing harvest progression retrospectively to the 2006 run-timing indicated the average harvest percentage was 50% before the quarter point of the run, 52% between the quarter-point and the three-quarter point, and 62 % after the midpoint of the run. A comparison of harvest progression to historical run-timing indicated a strong initial harvest, well above expectation for the historical quarter-point, followed by slower increases and an eventual leveling off around the 60 percentile (Figure 7). The final percentage for summer chum salmon from all interviewed households was 57% occurring on August 6, 2006.

Galena

Harvests occurred between June 18 and July 30, 2006. Eight to 18 households were interviewed weekly. A minimal harvest increase was reported from June 25 to July 2, 2006 when the first pulse of the Chinook salmon run passed on June 28, 2006. The largest weekly increase in harvest progression for Chinook salmon was 47% from July 2 - 9, 2006 when the second pulse was present on July 6, 2006. During this week the quarter-point and midpoint of the Chinook

salmon run occurred in Galena. The third pulse passed the Galena area on July 11, 2006 when fishermen reported an increase of 8%. The remaining harvest progression occurred after the three-quarter point on July 12, 2006. A comparison of harvest progression to historical run-timing indicated that harvests near the quarter point were minimal, but comparable harvests occurred around the midpoint and three-quarter point (Figure 8). Between June 19 and July 4, 2006, many fishermen commented that fishing conditions were poor due to high water, wind, and large amounts of debris and also indicated that gas prices were prohibitive. The final percentage for Chinook salmon harvest from all interviewed households was 72% occurring on July 30, 2006.

Beaver

Harvests occurred between June 25 and July 30, 2006. Six households were interviewed weekly. The first pulse of Chinook salmon passed through Beaver on July 9, 2006 when fishermen reported a harvest increase of 45% during the week of July 9 – 16, 2006. The quarter-point of the Chinook salmon run occurred on July 15, 2006, the midpoint occurred on July 19, 2006, and the three-quarter-point occurred on July 23, 2006. An additional 12% increase occurred between July 16 – 23, 2006, and a 17% increase occurred July 23 – 30, 2006 when the second pulses were present on July 17, 2006 and July 22, 2006, respectively. A comparison of harvest progression to historical run-timing indicated fishermen in Beaver completed their harvest goals ahead of quartile points (Figure 9). The final percentage for Chinook salmon harvest from all interviewed households was 100%.

Gear Type

Fishery managers have the ability to regulate fishing gear if there is a concern for species conservation. Regulations regarding the allowable fishing gear differ between lower river and upper river fishing districts. The primary difference is the use of drift gillnets in the lower river. Subdistrict 4A has a limited drift gillnet fishery availability regulated by date, see 5AAC 01.220(e) (2) (ADF&G 2004). Sixty fishermen were interviewed for gear type in lower river Districts 1, 2, and 3 and the middle river Subdistrict 4A. In these areas the use of a drift gillnet was predominant ($n = 46$). In the middle river Subdistricts 4B and 4C and in the upper river Subdistrict 5D, 27 fishermen were interviewed for gear type. The majority ($n = 19$) reported fishing with set gillnets.

Discussion

The objectives of this project were to collect, document, and provide fisheries managers information on subsistence salmon harvests inseason, enabling more informed management decisions. As a result, the utility of the inseason salmon harvest interview project was multifunctional. First, the information had to evaluate inseason subsistence salmon harvest progression during the fishing season; second, the project had to provide comparisons to other inseason management information; and third, the project had to provide an evaluation of village subsistence harvest goal success. Additionally, the project provided a value added component to the YRDFFA teleconferences by increasing Yukon River community representation and assuring consistent information reporting and attendance.

Yukon River subsistence fishermen are a diverse group utilizing a variety of different gear types, fishing locations, and techniques to harvest salmon. The active nature of these fishermen is one

reason that inseason subsistence information is difficult to collect. Many households relocate to fish camps during summer months and as a result have limited access to teleconferences and management information; therefore interviews are conducted using different methods. As a result, weekly interviews are conducted face to face in local villages at fishermen houses or fish camps, village boat launches, and, to a lesser extent, over the telephone. This dynamic interview process is important for managers because the information includes input from a variety of subsistence fishermen on a range of topics, but the interviews are also valuable for fishermen because they often receive updated management information, i.e., News Release or Fishery Updates, and river-wide fishing news from interviewers.

Managers receive subsistence fishing reports on YRDFA teleconferences and in ad hoc phone calls, but this information does not provide a comparative function useful for predicting subsistence harvest progression and ultimately harvest goal completion. To achieve a comparison, weekly harvest progression was compared to historical run-timing quartiles. The subsistence salmon harvest goal progression in the villages of Emmonak, Holy Cross, and Beaver indicated inseason that harvest progression was greater than historical run-timing quartiles. Specifically, the 2006 reported harvest percentages were comparable to the historical quarter-point, midpoint, and three-quarter point implying that these villages were likely to complete their subsistence salmon harvest goals. Subsistence salmon harvest progression reported inseason by households in the villages of Kaltag, Galena, and Huslia differed as compared to historical quartiles. The villages of Kaltag and Galena indicated a harvest progression smaller than 25% at the quarter-point, but comparable harvest progression at the midpoint and three-quarter point, whereas, harvest progression in the village of Huslia was larger at the quarter-point and smaller at the midpoint and three-quarter point. The divergence in the latter villages between harvest progression and historical quartiles was likely due to poor fishing conditions in those villages at those times.

A secondary utility of this project is to provide comparative information to other inseason information. Comparing harvest progression to pulse-timing was an effective tool for identifying which pulse of Chinook salmon contributed the largest subsistence harvest. The first pulse of the run triggers subsistence salmon fishing in most communities and entered the lower river on June 15. In the villages of Emmonak and Beaver, this pulse contributed the largest increase in harvest progression for Chinook salmon. As this pulse traveled upstream, increases in harvest progression were evident in other villages. However, the second pulse of Chinook salmon, which entered the lower river on June 23, contributed a larger increase in harvest progression in Kaltag and Galena. Harvest progression in Holy Cross and Huslia was approximately the same for the first and second pulses. In general, the first pulse provides a larger portion of subsistence harvest in lower river communities than in upper river communities, whereas, the second pulse is more important for subsistence harvests in upper river communities.

The historical (1989 - 2005) start date for Chinook salmon commercial fishing in the lower river in District 1 is June 16. During this time, the amount of information available for fishery managers, particularly subsistence fishing information is minimal. A reasonable management expectation prior to implementing commercial fishing is to compare the 2006 harvest percentages with historical indices. During the 2006 fishing season, the first commercial fishing period took place in District 1 on June 19, when the reported harvest progression in Emmonak was 84% and in Holy Cross was 47%. As compared to the (2003 – 2005) average harvest

percentage in the villages of Emmonak and Holy Cross near June 16, the harvest progression was approximately 50% and 20% respectively, indicating an above average harvest progression.

The last function of this project was to evaluate if fishermen met their subsistence harvest goals inseason. Based on the information collected during the 2006 Chinook and summer chum salmon fishing season, it appeared that most interviewed households met their subsistence harvest goals for Chinook salmon and summer chum salmon. Information collected during interviews indicated that most households fished less time than in the 2005 fishing season. Excluding the villages of Huslia and Galena, all villages had a season ending harvest percentage in the 90 percentile and Beaver reported a 100% completion. Galena reported finishing in the 70 percentile for Chinook salmon and Huslia ended near the 50 percentile for Chinook salmon and 60 percentile for summer chum salmon likely due to poor fishing conditions during the middle part of the Chinook and summer chum salmon runs.

Yukon River management decisions are usually made at the beginning of the week and shared on YRDFFA river-wide teleconferences. This project plays an important role in the YRDFFA inseason teleconferences because interviewers attend and participate more regularly and therefore increase teleconference attendance. The YRDFFA teleconference has had varied participation from Yukon River communities because the majority of subsistence fishermen do not or are unable to participate. In most cases, an interviewer was the only member of a village participating in the teleconference. Fourteen teleconferences occurred in 2006 with the participation of 26 Alaskan communities. Of these, 11 communities participated in approximately half of the teleconferences and four of these were involved in this project. The average number of teleconferences attended by an Alaskan village was six; the average number of teleconferences attended by villages participating in this project was eight. The use of teleconferences to promote information sharing is an important tool for managers and fishermen if communities participate, but without attendance, the utility is gone.

Recommendations

This project demonstrates how subsistence harvest information can be collected inseason, utilized by managers as a comparative and evaluative tool, and provides value added information to the YRDFFA teleconference project. A long-term objective of this project is to employ non-federal local hires in all participating villages. The use of RITs on this project has been decreasing since 2002 while the number of YRDFFA local hires has been increasing. Development of partnerships should continue and new villages should be included in this project.

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Table 1. Number of weekly interviews by interview week conducted by local hire and Refuge Information Technicians in the villages of Emmonak, Marshall, Holy Cross, Kaltag, Galena, Huslia, and Beaver during the 2006 salmon fishing season.

Week Ending	Emmonak	Marshall	Holy Cross	Kaltag	Galena	Huslia	Beaver
4-Jun			10				
11-Jun	7	10	11				
18-Jun	15	9	11		18		
25-Jun	13		15		12	4	
2-Jul	18		15	7	13		6
9-Jul	10		11	7	9	5	7
16-Jul	9	8		6	8	6	7
23-Jul				7	8	4	7
30-Jul				7	8	6	7
6-Aug						4	
Total # of interviews	72	27	73	34	76	29	34
Total interview weeks	6	3	6	5	7	6	5

Table 2. Number of households (hh) interviewed in the 2006 YR DFA/USFWS inseason salmon interview project villages as compared to the number of heavy/medium harvest strata and the total number of fishing households reported in Buser and Hamazaki 2005.

Village	Total no. of fishing hh	No. of hh in Heavy/Medium harvest strata	No. of hh Interviewed	% of hh interviewed
Emmonak	81	22	18	22%
Marshall	57	12	8	14%
Holy Cross	38	6	15	39%
Kaltag	43	2	7	16%
Galena	59	6	18	31%
Huslia	29	4	6	21%
Beaver	14	2	7	50%

Table 3. Total number of YR DFA teleconferences attended by local hire and Refuge Information Technicians in the villages of Emmonak, Marshall, Holy Cross, Kaltag, Galena, Huslia, and Beaver during the 2006 salmon fishing season.

Week Ending	Emmonak	Marshall	Holy Cross	Kaltag	Galena	Huslia	Beaver
30-May	X	X					
6-Jun			X	X	X		X
13-Jun	X				X		X
20-Jun	X	X	X	X	X	X	X
27-Jun	X			X	X	X	
4-Jul	X			X			
11-Jul	X			X	X	X	
18-Jul	X			X	X	X	X
25-Jul	X			X	X	X	X
1-Aug	X			X	X		X
8-Aug	X			X	X	X	
15-Aug	X				X	X	X
22-Aug	X			X		X	
29-Aug	X				X	X	
Total	13	2	2	10	11	9	7

Table 4. Total number of household responses to the 2006 inseason subsistence interview questions for Chinook salmon in the villages of Emmonak, Marshall, Holy Cross, Kaltag, Galena, Huslia, and Beaver.

Interview date	Compared with this time "LAST" year, how were your catch rates for salmon this week?			Compared with this time "LAST" year, is the amount of time you have fished?		
	Poor	Same	Better	Less	Equal	More
Emmonak						
11-Jun	1			2		
18-Jun	1	4	6	8	4	
25-Jun	2	1	7	7	1	2
2-Jul		2	6	7	1	1
Marshall						
11-Jun	7			8		
18-Jun	8			9		
16-Jul	3	4	1	5	2	1
Holy Cross						
18-Jun	4			1	1	2
25-Jun		3	11		1	13
2-Jul		4	10		1	14
9-Jul		2	1		1	2
Kaltag						
2-Jul	2	2	3	3	2	2
9-Jul		4	3	2	4	1
16-Jul	1		4	1	3	1
23-Jul	1	1		1	1	
30-Jul	1			1	1	
Galena						
18-Jun	1	2	2	1	2	2
25-Jun	6			5		1
2-Jul	4	3		2	5	
9-Jul	1	4	1		5	1
16-Jul	1	2	2	2	2	1
23-Jul	1	2		3		
30-Jul		1	1		2	
Huslia						
2-Jul	4			3		1
9-Jul	2	1	1	1	2	1
16-Jul	2	3	1	3	1	2
23-Jul	4			4	1	
Beaver						
2-Jul		5		5		
9-Jul	3	3	1	3	4	
16-Jul	2	2		1	4	1
23-Jul	2	1		1	2	
Total	64	56	61	89	53	49

Table 5. Total number of household responses to the 2006 inseason subsistence interview questions for summer chum salmon in the villages of Emmonak, Marshall, and Huslia.

Interview date	Compared with this time "LAST" year, how were your catch rates for salmon this week?			Compared with this time "LAST" year, is the amount of time you have fished?		
	Poor	Same	Better	Less	Equal	More
Emmonak						
18-Jun		1	11	11	1	
25-Jun			9	9		
2-Jul		1	7	7	1	
Marshall						
11-Jun	4			2		
18-Jun	6	1	1	8		
16-Jul	2	3	3	6		1
Huslia						
2-Jul	4			3		1
9-Jul			4	1	1	2
16-Jul	1		5	3		3
23-Jul	4			4		
30-Jul	6			6		
Total	27	6	40	60	3	7

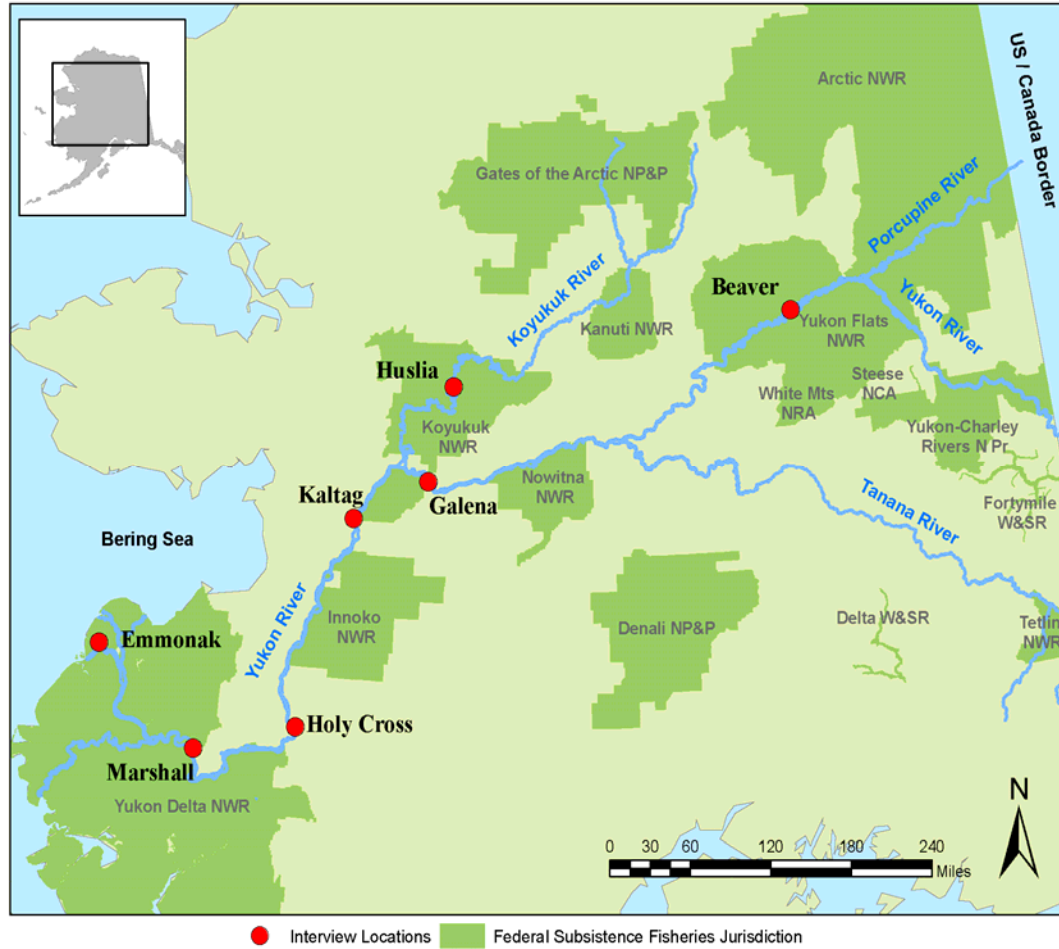


Figure 1. Map of the Yukon River drainage highlighting the 2006 YRDEFA/USFWS inseason salmon interview project villages of Emmonak, Marshall, Holy Cross, Kaltag, Huslia, Galena, and Beaver.

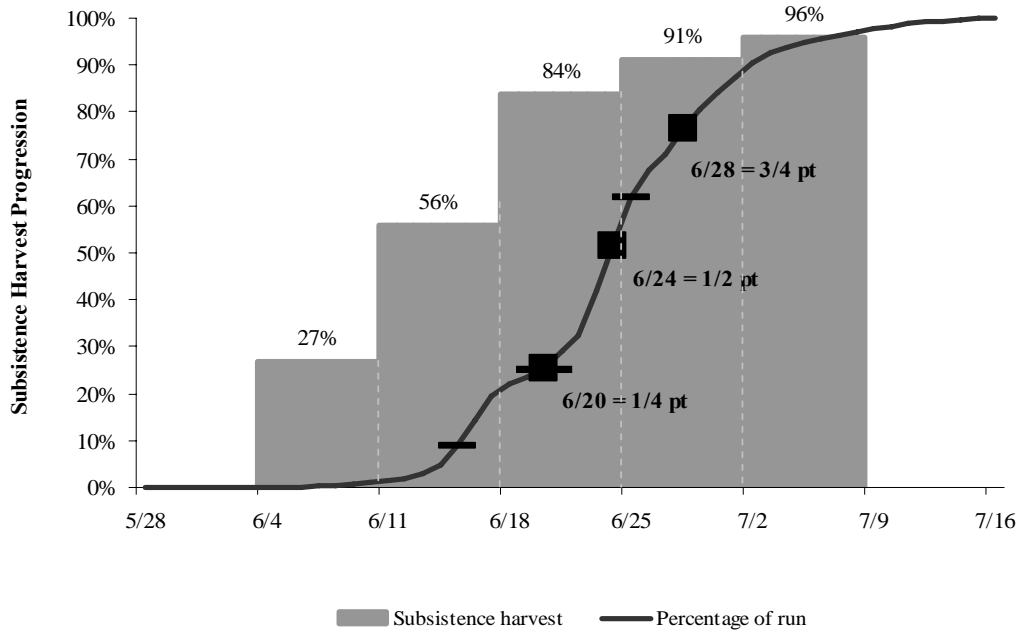


Figure 2. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Emmonak. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

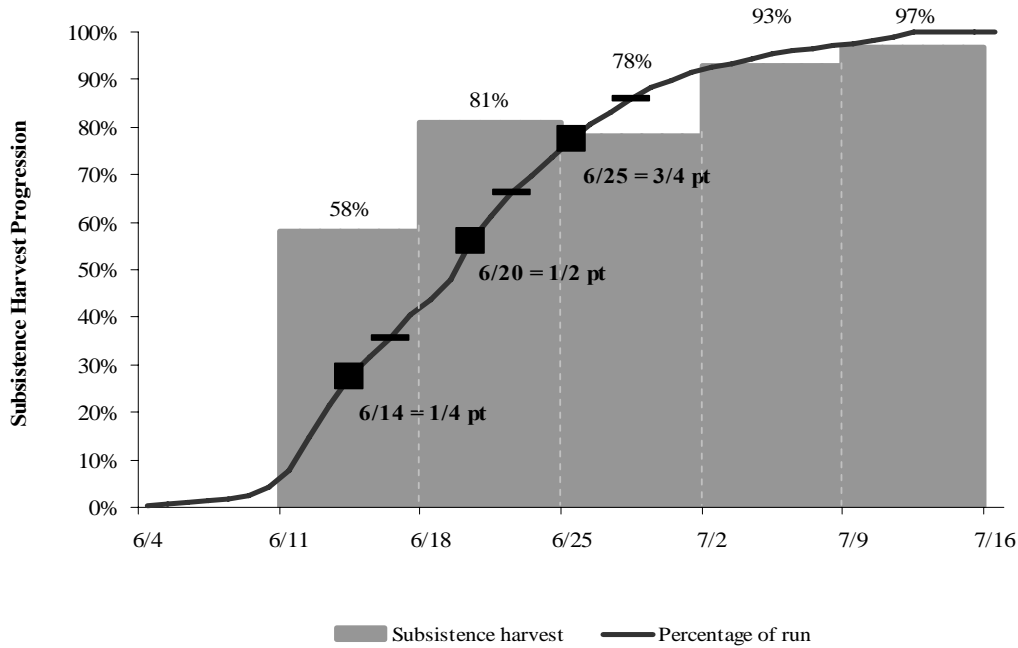


Figure 3. The 2006 reported weekly average summer chum salmon subsistence harvest from interviewed households compared to the percentage of the run in Emmonak. Historical (1986-1991, 1993-1995, and 1997-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

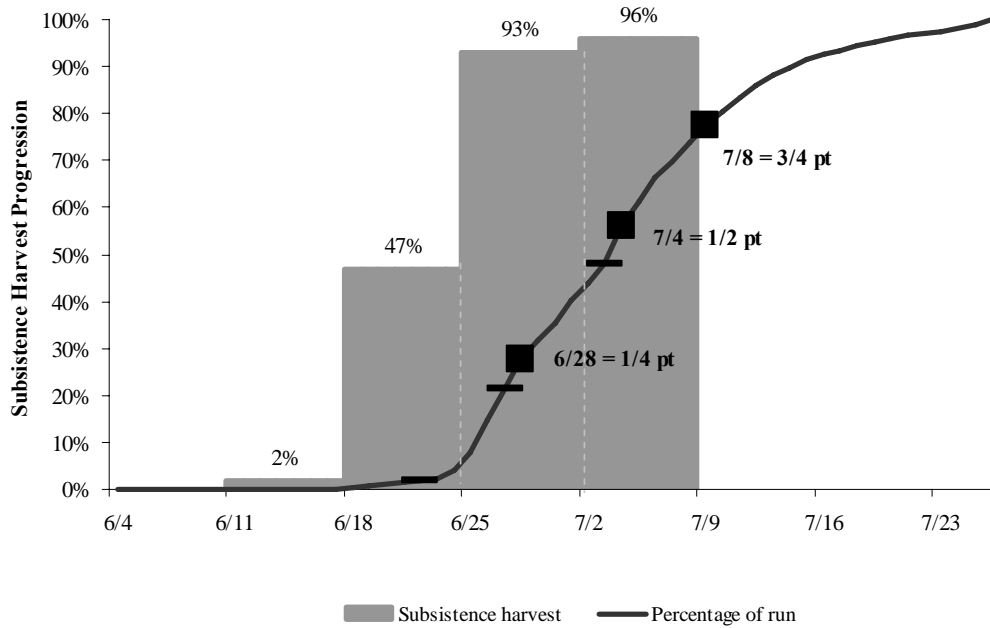


Figure 4. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Holy Cross. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

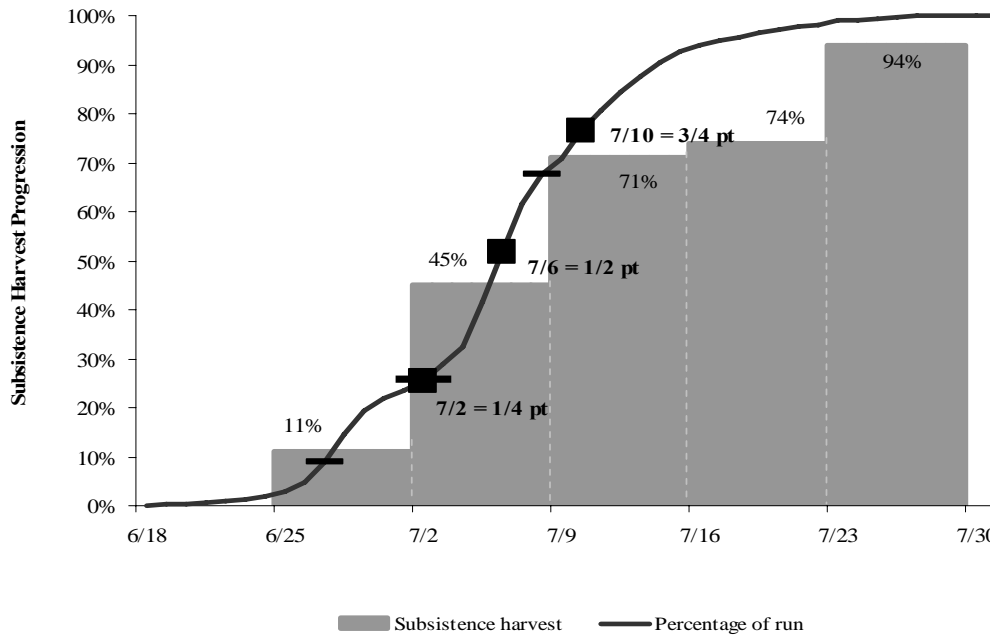


Figure 5. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Kaltag. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

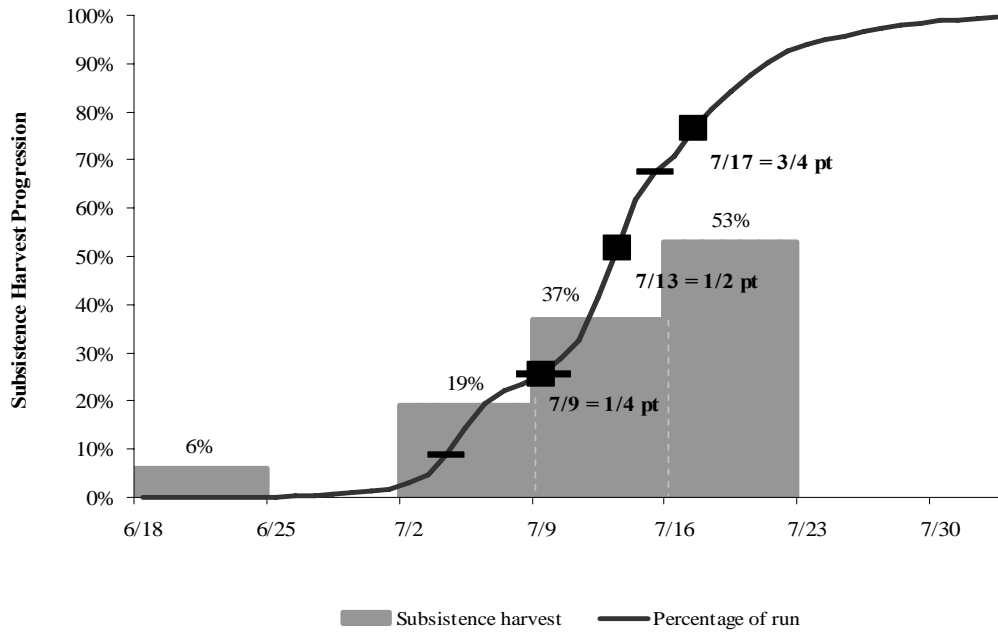


Figure 6. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Huslia. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

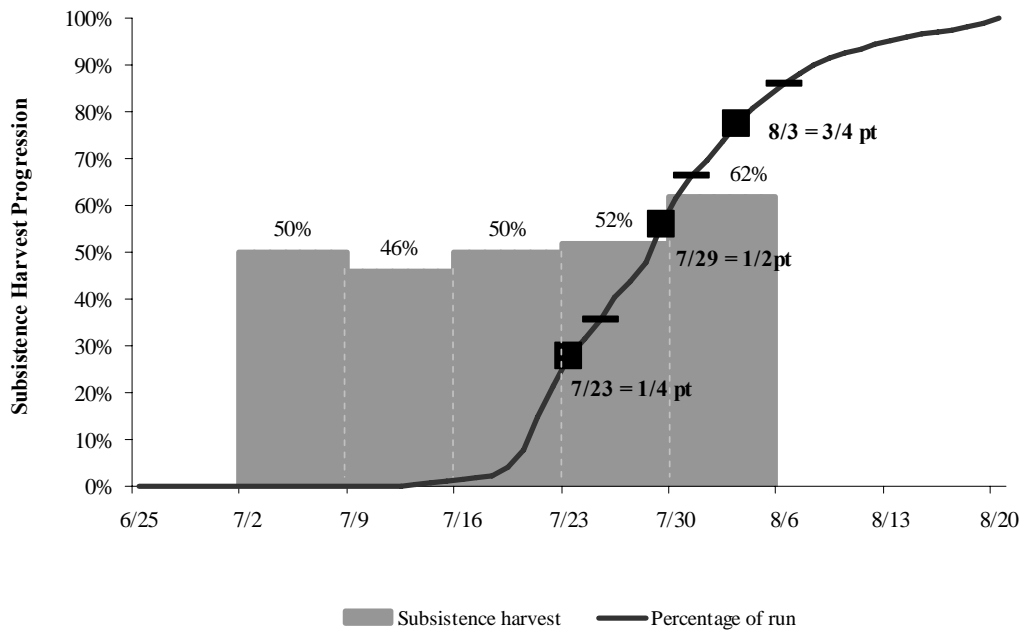


Figure 7. The 2006 reported weekly average summer chum salmon subsistence harvest from interviewed households compared to the percentage of the run in Huslia. Historical (1986-1991, 1993-1995, and 1997-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

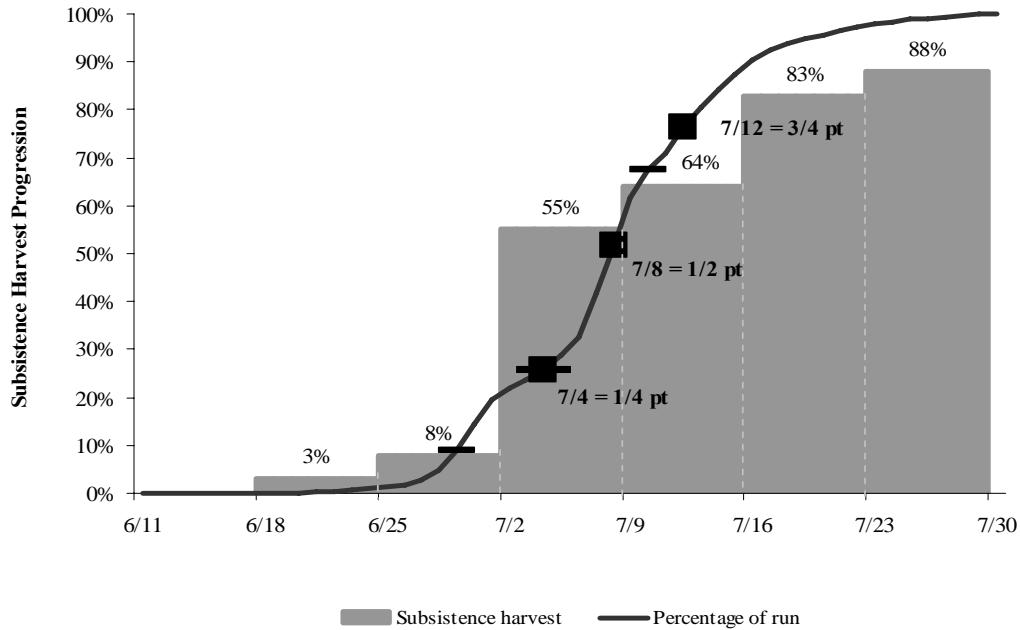


Figure 8. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Galena. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

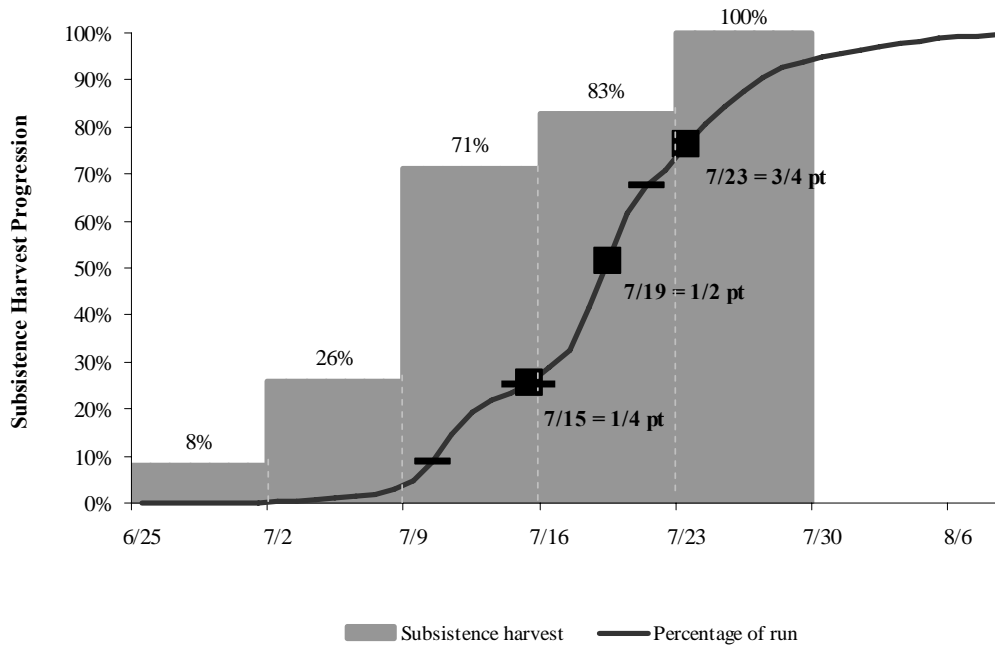


Figure 9. The 2006 reported weekly average Chinook salmon subsistence harvest from interviewed households compared to the percentage of the run in Beaver. Historical (1989-2005) run-timing indicated by (-) and (■) indicates 2006 run-timing as denoted by text.

Appendix A. The 2006 YR DFA/USFWS inseason salmon interview project Chinook salmon weekly harvest summary sheet.

Preliminary Data

Chinook Salmon Harvest Interview Summary

Interview/Week		Weekly Date:		2006			
Village	Interview Date(s)	# of Interviews	Gear Type	Harvest % ^a	Catch Rate ^b	Time Fished ^c	Fishing Days ^d
Emmonak			Drift gillnet	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			
Marshall			Drift gillnet	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			
Holy Cross			Drift gillnet	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			
Kaitag			Drift gillnet	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			
Galena			Fishwheel	0 - 25	BETTER	MORE	
			Drift gillnet	26 - 75	SAME	EQUAL	
			Set gillnet	76 - 100	POOR	LESS	
			Combination	weekly avg. % =			
Beaver			Fishwheel	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			
Eagle			Fishwheel	0 - 25	BETTER	MORE	
			Set gillnet	26 - 75	SAME	EQUAL	
			Combination	76 - 100	POOR	LESS	
			Other	weekly avg. % =			

^a Where are you at in your harvest?

^b Compared to "LAST" year how were you catch rates?

^c Compared to "LAST" year is the amount of time fished?

^d Average number of fishing days of all interview participants?

DNF = Did not fish