RC6

COOPER LANDING FISH AND GAME ADVISORY COMMITTEE MINUTES

FILED 2-4-11

DATE OF MEETING: Friday, January 7, 2011
MEMBERS PRESENT: Karl Romig, Ed Holsten, John Pearson, Bob Overman, George Heim, Dr. James Givens, Robert Gibson, Mike Adams, Billy Coulliette,
MEMBERS ABSENT EXCUSED: Andy Szczesny, Kyle Kolodziejski, Gerald Neis, Colin Lowe
QUOROM PRESENT: Yes
AGENCY STAFF PRESENT: None
GENERAL PUBLIC PRESENT: Stacy Corbin, Carl Coulliette, Michael Wellemin
TIME MEETING CALLED TO ORDER: 6:02 PM

Attn: Shannon
RC Comments
UCI BOF

1. **ROLL CALL**
2. **APPROVAL OF AGENDA**
3. **APPROVAL OF MINUTES**
4. **REPORT FROM ADFG- NONE**
5. **OLD BUSINESS-** Upcoming elections next meeting January 21, 2011 3pm.
6. **NEW BUSINESS**

RECEIVED
FEB 04 2011
BOARDS
ANCHORAGE

A. Cook Inlet Area Finfish Proposals

105	All oppose: no need to make season longer
109	2 oppose: doesn't matter, 7 support. Think this would help the resource.
115	All oppose: doesn't matter
116	2 oppose: don't think it's significant; you will get kings no matter what, 7 support: a sallower mesh depth may help the kings.
117	All oppose: individual permit holders are better.
122	1 abstain, 8 support: think this is a good plan for the resource.
126	All abstain. We are in support of more fish in the Northern district. Not sure if this is the way about it.
128	All support as amended: erase the last sentence or make the OEG larger
129	All oppose: seems like an excuse to fish silvers
130	All oppose: seems like an excuse to fish silvers.
147	2 oppose: too much ink, no clarification; 8 support: Sounds like a good management plan.
152	All oppose: doesn't include all the other species to be managed as a sport fishery
156	All oppose: it is a small enough run the way it is, economic impact could be devastating for Cooper Landing.
159	1 oppose: 1 abstain; 8 support: it might help more the kings
163	1 oppose: doesn't think it is an issue, 8 support
168	1 oppose: like to see eliminate terminal fishery, 8 support
172	6 support:; 3 oppose: not necessary
174	All opose: non-residents don't have extra rights
186	2 oppose; 1 abstain; 6 support as amended - eliminate #1 eliminate escapement goal to be achieved
22	1 abstain; 8 oppose: 2 coho is plenty for a day
204	All oppose: it works well the way it is, no need to have a longer season.

RC6

COOPER LANDING FISH AND GAME ADVISORY COMMITTEE MINUTES

207	All oppose: it is a free day for Veterans, come on!
209	All oppose: isn't broken, no need
215	All support as amended: "barbless hooks when fishing for Rainbows and Dollys"
216	All opposed: doesn't need to happen
231	3 support:, 6 oppose: won't effect
235	1 abstain, 8 support: pulling the slot limit in July is just killing all the fish protected in May and June.
238	All oppose: not necessary, not a good idea from catch and release stand point.
243	All support: people should always be responsible for their catches.
246	All support: might not hurt, givin previus hydrocabon data studies.
248	1 support:, 8 oppose: a drift boats wake moves to slower than the current usually so its dissipated by the time it reaches shore.
251	All opposed: takes away too much opportunity
254	All opposed: not a big enough river
255	All opposed: people have boats can't already anchor in the People hole
256	All support: In order for some one to fully have control of their boat while it is beached you need to have your anchor set. As people get out and the boat gets lighter.
258	All support: A good idea to help clear conjestion of the river faster.
262	All oppose: too congested the way it is
260	All oppose: too many people already do it below the bridge
263	All oppose: river is too small, a tide fishery, already too congested

MEETING ADJOURNED 10:28PM, NEXT MEETING JANUARY 21, 3PM

RC7

Friday, February 04, 2011

Fax to: (907)465-6094

Attn: Board of Fisheries:

I absolutely oppose the following proposals !!!!!!!

174-Allow non residents to participate in dip-netting

175-A July 17th opener for dipping, rather than July10th

176-Open dip-netting only after escape goals are met, which is about halfway through the run

181-Establish a harvest cap of 150,000 for the Kenai River. (Last years take was almost 300,000)

183-Establish a guideline harvest of 10% for dip-netters and sport fishermen.(Commercial fishers would get the other 90% of all fish)

186-Reduce the bag limit to 15 fish per family

187-Reduce household limit to 10 fish.

189-Prohibit any retention of King Salmon during dip-netting

193 & 194-Prohibit dip-netting from a boat in the Kenai.

These fish do not belong to the commercial fisherman nor do they belong to any non-residents. This fishery is meant to be subsistence, for the people of Alaska ONLY. Leave the dip-netting as it is.

Sincerely,

Justin Gruenberg
PO Box 520673
Big Lake, AK
907-715-4195

Leave the dip-netting as it is. !!!!!!!

RC8

Friday, February 04, 2011

Fax to: (907)465-6094

Attn: Board of Fisheries:

I absolutely oppose the following proposals !!!!!!!

174-Allow non residents to participate in dip-netting

175-A July 17th opener for dipping, rather than July10th

176-Open dip-netting only after escape goals are met, which is about halfway through the run

181-Establish a harvest cap of 150,000 for the Kenai River. (Last years take was almost 300,000)

183-Establish a guideline harvest of 10% for dip-netters and sport fishermen.(Commercial fishers would get the other 90% of all fish)

186-Reduce the bag limit to 15 fish per family

187-Reduce household limit to 10 fish.

189-Prohibit any retention of King Salmon during dip-netting

193 & 194-Prohibit dip-netting from a boat in the Kenai.

These fish do not belong to the commercial fisherman nor do they belong to any non-residents. This fishery is meant to be subsistence, for the people of Alaska ONLY. Leave the dip-netting as it is.

Sincerely,

2/4/11

Jason Smith

Leave the dip-netting as it is. !!!!!!!

RC8

Friday, February 04, 2011

Fax to: (907)465-6094

Attn: Board of Fisheries:

I absolutely oppose the following proposals !!!!!!!

174-Allow non residents to participate in dip-netting

175-A July 17th opener for dipping, rather than July10th

176-Open dip-netting only after escape goals are met, which is about halfway through the run

181-Establish a harvest cap of 150,000 for the Kenai River. (Last years take was almost 300,000)

183-Establish a guideline harvest of 10% for dip-netters and sport fishermen.(Commercial fishers would get the other 90% of all fish)

186-Reduce the bag limit to 15 fish per family

187-Reduce household limit to 10 fish.

189-Prohibit any retention of King Salmon during dip-netting

193 & 194-Prohibit dip-netting from a boat in the Kenai.

These fish do not belong to the commercial fisherman nor do they belong to any non-residents. This fishery is meant to be subsistence, for the people of Alaska ONLY. Leave the dip-netting as it is.

Sincerely, Michael Savidge 2-4-11

Leave the dip-netting as it is. !!!!!!!

Kenai/Soldotna Fish & Game Advisory Committee

January 19, 2011 6:30PM

Roll call: Crawford, Shadura II, Brandt, Payne, Corr, Bucy, Maher, Carmichael, VanDevere, Bernecker, Joseph, Foust, Darby, Dykema, and Darch Excused: Tappan, Ermold and Eggemeyer.

Department: Robert Begich, Jason Pawluck

UCI Proposals: 235 - 244

Shadura II gave update on Kodiak trip.

Jim Butler gave public comment on proposal 116; shorter nets cause the nets to spin and reduces quality.

Dwight Kramer gave public comment on proposal 235; concern on decline of larger Chinook salmon in Kenai River.

Unanimous consent on approval of minutes for November 23 & 30, December 13 & 20, 2010, and January 05 & 12, 2011.

Next January 24, 2011, Board of Game proposals.

Kenai/Soldotna Fish & Game Advisory Committee

February 03, 2011 6:30PM

Roll call: Shadura II, Brandt, Payne,T Corr, Bucy, Maher, VanDevere, Bernecker, Joseph, Tappan, Ermold, Darby, and Darch Excused: Crawford, Carmichael, Andersen, Dykema, Meyer and N Corr.

Department: Jeff Fox

Brandt brought up that there was a discrepancy in Proposal numbers last night, Proposal 117 was documented and it was proposal 118 that was brought to the table. Chair Tappan discussed with Shadura II who brought the motion to the table and he acknowledged that yes it was 118 and not 117, seeing no objection from the committee the change was noted, that Proposal 118 passed 9/3/2 on February 2, 2011

Shadura II asked if he could use the AC as a reference for the Federal Subsistence Board. Chair Tappan asked if there was any objection, and there was none.

UCI Proposals: 117 – 324, 138, 139, 149, 161, 171, 325, 326, 327, 329, 330, and 331.

Next February 3, 2011, Board of Game proposals.

RC10

RECEIVED
FEB 0 [illegible] 2011
BOARDS

Dear Alaska Board of Fisheries:

(Paragraph describing the organization or business, who they represent, and their connection to the salmon fishery).

I would like to provide comment on the Early-run Kenai River King Salmon fishery. We used to have a thriving fishery surrounding the early kings on the Kenai in May and June. Now, it is a shell of its former self, which greatly impacts the recreational, social and economic values associated with it.

The current approach management for early-run Kenai kings has resulted in chronic confusion and management problems. These include:

- consistent inability to regulate escapements within the current goals,
- loss of future yield and opportunity due to escapements exceeding the goals,
- unnecessary loss of current fishery opportunities,
- purposefully-selective harvest by size and sex (slot limit),
- lack of consistency and predictability in in-season management, and
- unintended consequences of early-run management on crowding in the late-run fishery.

We fully support the proposal 230 submitted by Kenai River Sportfishing Association, which seeks a total review of all aspects the early-run management by the Board of Fisheries. KRSA proposes to open all aspects of early-run management for review by the BOF. KRSA is disappointed with many aspects of the early-run plan and the way the plan has been implemented by the Department. The sport fishery for early-run king salmon in the Kenai River has long been one of Alaska's premier recreational fisheries. Its popularity with both resident and non-resident anglers has contributed substantial recreational, social, and economic value to the local communities of the Kenai Peninsula and the State.

Sincerely,

Craig Chestler

Kenai River Sport fishing Guide

1308 Kiana Lane, Kenai Alaska 99611 (907)-398-3784

RC11

"Village with a Past, City with a Future"

210 Fidalgo Avenue, Kenai, Alaska 99611-7794
Telephone: (907) 283-7535 / FAX: (907) 283-3014
www.ci.kenai.ak.us

February 3, 2011

Governor Sean Parnell
State of Alaska
P.O. Box 110001
Juneau, AK 99811-0001

RE: ***CITY OF KENAI RESOLUTION NO. 2011-14 -- Supporting Sound Fisheries-Management Practices and Diversified Harvest Opportunities in the Cook Inlet***

At its February 2, 2011 meeting, the Kenai City Council unanimously passed its Resolution No. 2011-14.

Resolution No. 2011-14 expresses the City of Kenai's strong support of sound fisheries management practices in Cook Inlet, specifically with respect to the Kenai River salmon runs; requests the Board of Fisheries to recognize the historical and economic significance of the salmon runs that return to the Kenai River; and, requests the Board to avoid adoption of regulations that reduce opportunities for all Cook Inlet and Kenai Peninsula commercial harvesters and City of Kenai fish processors and other businesses without a sound biological reason for doing so.

CITY OF KENAI

Carol L. Freas
City Clerk

Cc: Commissioner Cora Campbell, Alaska Fish & Game
Alaska Board of Fisheries
Senator Tom Wagoner
Representative Mike Chenault
Representative Kurt Olson

Suggested by: Counselors Brian Gabriel and Joe Moore

CITY OF KENAI

RESOLUTION NO. 2011-14

A RESOLUTION OF THE COUNCIL OF THE CITY OF KENAI, ALASKA, SUPPORTING SOUND FISHERIES-MANAGEMENT PRACTICES AND DIVERSIFIED HARVEST OPPORTUNITIES IN THE COOK INLET.

WHEREAS, the City of Kenai has benefited from healthy well-managed salmon runs as a central part of its economy and quality of life for its citizens and visitors for over one hundred years; and,

WHEREAS, over the past several years, State of Alaska fishery policymakers have adopted regulations to increase opportunities for Alaska residents to harvest certain species of salmon, but have done so without regard to the impacts of those fisheries have on our community; and,

WHEREAS, over the past several years, Cook Inlet commercial fishers have experienced substantial reductions in fishing opportunities that adversely impacted their businesses and our local economy, while other users have not been burdened by the same conservation or harvest reallocation measures; and,

WHEREAS, the City has invested several hundred thousand dollars in an attempt to mitigate the impact of the resident-only fishery, by building infrastructure solely for the benefit of this fishery, often at the expense of spending capital on projects that would be otherwise utilized by citizens year around; and,

WHEREAS, in addition to business opportunities for many citizens of the Kenai Peninsula Borough and the State of Alaska, the Cook Inlet commercial salmon industry is a critical component of our local economy because it provides jobs and is a reliable tax base on both real and personal property; and,

WHEREAS, because it has been able to rely on a predictable stream of salmon harvested in Cook Inlet during summer months, the local seafood processing industry has been able to expand its season by months and now includes processing other species such as halibut and cod, as well as fish flown in from other regions of the State; and,

WHEREAS, the local commercial salmon industry is a vital part of our local economy because it is supported by local commercial fishers, processors and the many vendors that rely on its business year around; and,

WHEREAS, improvements in salmon handling and quality in both the commercial harvest and processing sector has resulted in salmon prices nearing 20-year highs -- substantially increasing fish taxes to the Borough and the City of Kenai; and,

WHEREAS, adoption of regulations that significantly reduce the opportunities for Cook Inlet commercial fishers to harvest and process salmon during its traditional summer season, without a sound biological reason for doing so, will result in long-term and perhaps irreversible damage to our local economy; and,

WHEREAS, the Alaska Department of Fish & Game, *2011 Upper Cook Inlet Sockeye Salmon Forecast* indicates a commercial, sport, and personal use salmon harvest of 4.4 to 4.8 million salmon in Cook Inlet, most of which will be processed within the City of Kenai, and suggests managers have reached an acceptable balance between the needs of competing salmon harvesters.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF KENAI, ALASKA, as follows:

Section 1: Supports sound fisheries management practices in Cook Inlet specifically with respect to the Kenai River salmon runs; and,

Section 2: Respectfully requests the State of Alaska Board of Fisheries to recognize the historical and economic significance of the salmon runs that return to the Kenai River by avoiding adoption of regulations that reduce opportunities for all Cook Inlet and Kenai Peninsula salmon harvesters and City of Kenai fish processors and other businesses without a sound biological reason for doing so.

Section 3: Upon passage, a copy of this resolution shall be forwarded to Governor Sean Parnell, Alaska Department of Fish & Game Commissioner Cora Campbell, Alaska Board of Fisheries members (individually), Senator Tom Wagoner, Speaker of the House Mike Chenault, and Representative Kurt Olson.

PASSED BY THE COUNCIL OF THE CITY OF KENAI, ALASKA, this second day of February, 2011.

Pat Porter

PAT PORTER, MAYOR

ATTEST:

Carol L. Freas

Carol L. Freas, City Clerk

RC12

Lee & Charlotte Allen
9101 E. Mile 6 Rd.
Palmer, AK 99645

Dear Board members,

We support proposals no. 126, 134, 135, 136, 137, 142, 143, 144, 159, 202, 203 and 204.

We Oppose proposals no. 108, 110 and 145.

Thank you

Lee D Allen
Charlotte Allen

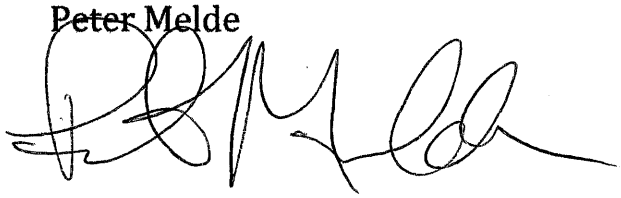
RC13

Board of Fisheries
Upper Cook Inlet Finfish Meeting
Anchorage Feb 20-March 5, 2011

To Whom It May Concern:

I am writing in response to the blatant attempt by commercial fisheries interests to gut the personal use dipnetting season that is so important to working Alaskan families. I feed my family on the salmon that return each year to the Kenai River. Those fish belong first and foremost to individual Alaskans and not to some business interest that seeks to steal those same fish and then force the people of this State to buy OUR fish from THEM! Leave our personal use dipnetting alone! I reject all proposals to limit the take by personal use fishers.

Peter Melde



RC14

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINING, LAND & WATER
SOUTHCENTRAL REGION LAND OFFICE

SEAN PARNELL, GOVERNOR

550 WEST 7TH AVENUE, SUITE 900C
ANCHORAGE, ALASKA 99501-3577
PHONE: (907) 269-8503
FAX: (907) 269-8913

RECEIVED
FEB 10 2011
BOARDS

MEMORANDUM

TO: Through the Chairman, to the Alaska Board of Fisheries, ADF&G,
Jim Marcotte, Director, Boards Support Section, ADF&G

FROM: Raymond Keough (Natural Resource Manager I) Shore Fishery Leasing Unit

THRU: Richard Thompson (Natural Resource Manager III) Southcentral Regional Manager
Adam Smith (Natural Resource Manager II) Southcentral Leasing Unit

DATE: February 4, 2011

SUBJECT: Upper Cook Inlet Finfish Proposals (Proposed changes in regulations)

This memo provides the Alaska Board of Fisheries (BOF) with agency comments for **Proposals 117, 118 and 324** regarding the proposed changes to the Upper Cook Inlet Finfish Regulations, (5 AAC 21.331.) gillnet specifications and operations. *These proposals seek to allow an individual who owns two setnet Limited Entry Permits (LEP) to operate two legal units of set gillnet gear simultaneously.*

Background: As manager of the state-owned tide and submerged lands, the Department of Natural Resources (DNR), issues Shore Fishery Leases for commercial setnet fishing development. Obtaining a Shore Fishery Lease from DNR is not required, although with a lease the leaseholder has "first priority right" to use the site, and may exclude others from fishing their leased site, when they are physically present and fishing. The establishment and present existence of DNR senet leases is an excellent land management tool that in large part creates a sense of order/management to the fishery, and significantly minimizes additional need for enforcement. Shore Fishery Leasing Regulations (11 AAC 64) direct the administration of the setnet leasing program, and to manage and our program using the distances, gear and open fishing areas as established for each Limited Entry Permit (LEP) holder, per the Commercial Finfish Regulations (5 AAC 03 – 5 AAC 39). Therefore proposals to the Board that result in changes to the Alaska Department of Fish and Game (ADF&G) Finfish Regulations do have pronounced affects on the administration of our DNR setnet leasing program.

Of the 2200 plus, commercial setnet fishing permits (Limited Entry) that have been issued statewide, there are around 1045 setnet leases authorized by DNR, and specifically administered by the Shore Fishery Leasing Unit. In Cook Inlet there are approximately 735 setnet LEP's, of that about 17 are latent. Of these 735 LEP's, DNR manages 233 setnet leases in the waters of Upper Cook Inlet.

Proposals 116, 117 and 324: These proposals seek to allow an individual who owns two setnet LEP's to operate two legal units of set gillnet gear simultaneously. Described below are the benefits and challenges of these proposals from a DNR land management perspective

As explained, many sections within Shore Fishery Leasing regulations (11 AAC 64) are directed by the requirements set forth in ADF&G regulations (5 AAC 03 – 5 AAC 39). This is a relationship that has worked reasonably well since the 1960's and creates consistency in both land and fisheries management, as long as "the left hand speaks to the right". By allowing the simultaneous use of dual LEP's by an individual within a fishery (as we have seen in Bristol Bay) has had many benefits to our program including increases in new applications, assignments and amendments. If a person meets the criteria, our Unit allows for an individual with dual LEP's to obtain additional DNR leases, as long as an ADF&G regulation is in place to allow for dual LEP usage. All DNR leases are issued consistent with ADF&G commercial fishing regulations, meaning no DNR lease exceeds the maximum amount of gear that is fishable per LEP. If any of these proposals are passed, then this practice would also work for us and our lessee's in the Upper Cook Inlet, and we could issue additional leases by request.

Along with the benefits, (as with most management decisions) there are also some challenges for us when administrating and granting these additional leases. The adoption of sunset clauses such as those used in Kodiak and Bristol Bay creates management problems for us and the fisherman. The recent decision by the Board in Kodiak, not continue the ability to fish both LEP's has now created a situation in which we now have to either close leases; have the fisherman assign their second lease or do an amendment. When granting these additional leases the fishermen are made aware that if a "sunset clause" is included, that the use of the second LEP and any additional leases may only be temporary in nature. With that said this temporary and revocable privilege does create a sense of entitlement for the fisherman, then, and when and it is taken away this creates potential conflicts between the fisherman and the state agencies. The decisions (based upon proposals) to create and then eliminate of the usage of dual LEP's related to "sunset clauses" is troublesome for many involved. It causes displacement in a somewhat organized setnet fishery and in-directly guides DNR to "bounce back and forth" when administrating our important setnet leases.

Summary: We support the concept of proposals 116, 117 and 324, and believe these proposals have many benefits to the fishery and our land management agency. We do however oppose the introduction of the "sunset clauses" that have been previously added by the Board in the past. We respectfully ask the Board to consider these issues and the above comments during the decision making process.

To the Board, thank you for the opportunity to comment on these proposals. Your important decisions not only impact the actual fisheries, but also the surrounding state land and waters that are managed by the DNR. For more information, please visit our website at: http://www.dnr.alaska.gov/mlw/shore/index.htm .

KRSA Proposal positions not included in the Index of Comments

Proposal #	KRSA position	KRSA Not listed
22	Favor	x
103	Oppose	x
119	Oppose	x
125	Oppose	x
127	Favor	x
135	Comment	x
166	Comment	x
167	Oppose	x
184	Oppose	x
185	Oppose	x
229	Oppose	x
238	Oppose	x
239	Oppose	x
240	Oppose	x
243	Favor	x
254	Oppose	x
255	Oppose	x
282	Favor	x
286	Comment	x
292	Favor	x
293	Comment	x
294	Favor	x
295	Favor	x
298	Oppose	x

RC16

Re: Alaska Board of Fisheries Testimony- Upper Cook Inlet Hearings

Dear Board of Fish members, February 15, 2011

After attending Cook Inlet Fish Board meetings for the past 30 years I feel it is important to comment on proposals and concerns that impact commercial fishing in the Northern District of Cook Inlet and on the resource itself. I am unable to attend this year and would appreciate a moment of your time. I fish Three Mile Beach, one mile from the Chuitna River and have participated in this commercial fishery from May to September since 1981. In recent years the ADF&G has allowed us to fish regular sockeye periods with fishing only 1/3 of our gear. This has aided the fishery because Copper River Seafoods can schedule tenders and rely on a schedule that helps everyone fishing the area. This is especially true in Tyonek where up to 25% of the entire village has helped the commercial catch in various ways. The people of Tyonek/Beluga face the unprecedented prospect of direct strip coal mining of 11 miles of the Chuitna River tributaries which directly threatens the subsistence, commercial and sport fishing. The mine is in the permitting process and I hope you can lead on maintaining the excellent statewide Policy for the Management of Sustainable Salmon Fisheries that protects habitat. Many may argue for more salmon at the hearings, but without maintaining our valuable aquatic habitats and principles the Board stands for, our common salmon resource on the West Side of Cook Inlet will be lost forever. You can go to our website to learn more at www.chuitna.org. I hope you can be a positive voice in protecting salmon faced with mega mining projects around Alaska to help define limits of what reasonable development is. With your expertise, you are one of the only groups that can explain the impact of dams and direct mining on salmon streams for other state leaders. We fishermen and ADF&G cannot do this alone.

Northern District King Salmon

Three years ago my proposal to fish for Kings on a fourth period passed when the Board felt we were not close to meeting our quota of 12,500 and the runs were sound. Due to poor returns and catches, our commercial and sport King salmon fishery was closed to protect these stocks. The present system is working and the Department is doing a good job protecting these resources. The Department has now suggested that the Chuitna, Theodore and Lewis Rivers be listed as Chinook "stocks of concern". We need to trust the professional judgments of biologists in ADF&G. They have secured funds for a weir on the Chuitna and other streams. I support both of these measures because of the lack of accurate information from a one-time flyover each summer counting fish. The results of this method, which has been shown to be inaccurate in fish counting studies by ADF&G, is a poor way to manage any resource and especially one so threatened by coal pollution. It is important for the Board of Fish and the Department to also factor in personal knowledge of these streams to provide a better understanding of a resource we have observed for years. That is why we write these letters.

Analyzing proposals for changes in the Northern District King Salmon Management Plan they are written by river commercial sports guides of the Mat/Su business community. Their goal is to re-allocate the resource by closing our area to foster better catches in

theirs. Our industry has limited entry but commercial sports guides continue to grow in number and guarantee limiting out in local newspaper ads. The impact on the resource is neither sustainable nor reasonable, especially in spawning holes in the upper reaches of the Susitna Valley. Please consider my position on the following:

Proposal 121: **Against.** The one mile closure law is over one hundred years old statewide and was one of the first conservation measures undertaken in Alaska. It works well. This proposal for an extreme five mile closure would eliminate all commercial fishing on Three Mile, Cottonwood, and many other beaches. We do not fish in a stream channel and the author has never visited our fishery or is misled. Even at a minus 5 tide we do not have one sandbar or channel on Three Mile or Cottonwood Beach. This is simply a 100% allocation to commercial sports guides over traditional commercial set netters.

Proposal 142: **Against.** These early openings are important to gain an assessment of run strength. ADF&G has already used its authority to close the commercial and sports catch. This is simply reallocation to commercial sport guides.

Proposal 143: **Against.** 6 hour openings are difficult to fish in the Northern District due to the most extreme tides fished in Alaska. This proposal disrupts present market for processors. Tenders would again be lost and flying fish to Anchorage is expensive for fishermen and consumers. This proposal attempts to manage the entire District based on Deshka River Sport Guide restrictions. Biologists need to have flexibility in managing the fishery.

Proposal 144: **Against.** Attempts to micromanage the multiple King salmon stocks. The Department of Fish and Game has been conservative in the present management during low returns. They do not need their hands tied as professional biologists.

Proposal 145: **Support.** I support this if money is available for staff to advance science on Northern District King salmon.

General Cook Inlet Proposals

Proposal 158: **Against**. This would eliminate all commercial fishing in the Northern District because by the time our fish are counted in Northern District lakes the run is over. Allow present scientific data and professionals continue to work on counting Northern District salmon.

Central District Proposals

Proposal 119: **Against.** Drift boats expanding gear with two permits may greatly waste resource if two nets are out during heavy fishing. Major reallocation required of Cook Inlet salmon that would be difficult for biologists to factor in during season.

Proposal 129: **Against.** Same reasoning as 119.

Board of Fish Proposal 122: **Support**. Excellent Department proposal to protect Northern District stocks in a mixed stock fishery.

Proposal 127: **Support.** This drift fishery has had a major impact on returns to the Chuitna, Theodore, and Lewis Rivers for the past three years.

Proposal 132 **Support** With a worldwide shortage of wild salmon pick salmon prices have rebounded to support targeted harvest. In the past low prices could not meet the cost for tendering or flying out pinks. With ice machines and bleeding smaller mesh sizes can be once again utilized to market this resource.

Proposal 133: **Against.** Because of extreme tides 6 hr openings are very difficult and present safety issues with August weather. Very few Northern District fishermen are involved in this fishery due to weather. The catch is important for Tyonek village residents who live in area year-round. Tenders would not be able to support a 6 hr fishery. Catch is insignificant as compared with drift catch of these same stocks in the Central District. There is no "double fishing time". These are "mom-and-pop" set net operations. The small amount of dollars in this fishery can be very meaningful to rural residents in Beluga/Tyonek.

Proposal 135 **Support** This would simply update the management plan to reflect the present escapement goals for Chelatna, Judd, and Larson lakes.

Proposal 136: **Against.** The Department of Fish and Game has spent time and money on the Susitna sockeye counting problem. Let biologists manage this fishery and the counting of salmon.

Proposal 138: **Support.** The conservation burden on the Northern District Set Netters has been extreme. The sockeye are in river by July 30th. Extreme weather from Turnagain Arm limits this fishery in August. Anchorage fresh markets supply many Alaskans with quality salmon from this limited fishery that is continually trying to survive.

Proposal 223 **Support** Pike in our area are a significant problem. Give ADF&G more tools.

Proposal 270 **Against** This proposal manages the entire Northern District for Alexander creek. Pike killed the Alexander not overfishing. Let ADF&G address the pike problem in a professional manner and pass proposals 284 and 285 which allow sportsman to harvest large pike in Alexander Creek

Proposal 271 **Support** Theodore River needs protection.

Proposals 286, 287, 288, 289 **Support**. All of these help eliminate pike as an invasive species.

RC16

Thanks for your time.

Terry Jorgensen,
Three Mile Beach Commercial Fisherman,
Member of Chuitna Citizens Coalition.

RC17

MAYOR'S BLUE RIBBON
SPORTSMEN'S COMMITTEE
Matanuska-Susitna Borough
350 East Dahlia Avenue • Palmer, AK 99645

RECEIVED
FEB 16 2011
BOARDS

February 14, 2011

Commissioner Cora Campbell
Alaska Department of Fish and Game
PO Box 115526
Juneau, Alaska 99811-5526

Mr. Vince Webster, Chairman
Alaska Board of Fisheries
PO Box 121
King Salmon, Alaska 99613

Dear Commissioner Campbell and Chairman Webster,

The Upper Cook Inlet Board of Fisheries meetings have a long history of dealing with contentious issues regarding the management of the Cook Inlet salmon stocks. The basis of most of this contention is how those fisheries resources are allocated between the diverse user groups involved in the fisheries and has always been a difficult and controversial issue for the Alaska Board of Fisheries (BOF) to undertake.

The Matanuska-Susitna Borough Mayor's Blue Ribbon Sportsmen's Committee (MBRSC) is well aware of this controversy. We acknowledge that the department's responsibility in these BOF meetings is to provide the best available biological and/or subsistence data to the BOF for their consideration in making allocation decisions. That is the purpose of all the written staff reports and oral presentations made to the BOF prior to and during the meetings.

However, the department has recently generated one significant report which steps outside the parameters of biology and steps into the world of social and economic effects of allocation of salmon stocks statewide with the report, ***Economic Impacts and Contributions of Sportfishing in Alaska, 2007 (Professional Publication No. 08-01, December, 2008.)*** This publication was in the process of being finalized during the last Upper Cook Inlet BOF meeting but the findings and conclusions were not available to board members at that time for their use and consideration in voting on proposals.

ADF&G's position on the overwhelming majority of proposals coming before the BOF for this upcoming UCI meeting is, quoting directly from staff comments, "The department is **NEUTRAL** on this allocative proposal." The BOF relies heavily on ADF&G recommended actions on proposals. However, to make the best possible decision on any proposal, the BOF needs access to all available information the department can provide for the board's consideration.

We do not know what department oral presentations are planned for the upcoming UCI meeting. However, we strongly urge the department to include a presentation of the findings of the economic report, PP No. 08-01, to the BOF for the following reasons. This is the first UCI meeting since this economic report has been available where a formal presentation of its findings can be made to the BOF and the attending public.

Also, four of the current members of the BOF were not members of the board during the last UCI meeting. These members may not be aware of the PP No. 08-01 report and its specific findings regarding the Southcentral Alaska recreational fisheries situation. Information on the impact of the commercial fisheries in Cook Inlet has been available for years and has been presented to the BOF to consider in their allocation deliberations. Solid economic and social information on the impacts of the sports fishery have been missing and what has been available has been largely speculative and allegorical in nature. This ADF&G report finally provides real data in this area.

Finally, Alaska Statutes 16.05.251. Regulations of the Board of Fisheries. (e), states, that the Board of Fisheries may allocate fisheries resources among personal use, sport, guided sport, and commercial fisheries. The board shall adopt criteria for the allocation of fisheries resources and shall use the criteria as appropriate to particular allocation decisions. The criteria may include factors such as (1) history of the fishery; (2) numbers of persons participating in the fishery; (3) fishery's importance in providing opportunity for residents to obtain fish for personal and family consumption; (4) availability of alternate fisheries resources; (5) economic importance to the state; (6) economic importance to the region and area; and (7) importance in providing recreational opportunity. These criteria are referenced in regulations 5 AAC 39.205 and 5 AAC 77.007.

Criteria 5 and 6 speak directly to the economic impact of a fishery. Criteria 3, 4, and 7 address both social and economic influences a fishery can have on a personal and family situation. Criteria 1 and 2 require a look at the history and participation within a fishery. Clearly, the PP No. 08-01 report speaks directly to at least five of the seven allocation criteria and indirectly to the other two criteria the BOF is required to consider.

For these reasons, the MBRSC strongly encourages you, Commissioner Campbell, to have ADF&G make a formal presentation of their economic report, PP No. 08-01, to the BOF during the UCI meeting. If this presentation is not currently scheduled, we respectfully ask Chairman Webster to work with the department to assure the report presentation is made available to the full board and the attending public prior to deliberations on the proposals under consideration.

Sincerely,

Bruce Knowles, Chairman
Matanuska-Susitna Borough Mayor's Blue Ribbon Sportsmen's Committee

cc: Jim Marcotte, Executive Director, Alaska Board of Fisheries
Larry DeVilbiss, Mayor, Matanuska-Susitna Borough

RC18

Review of

Kenai River Chinook: Acoustic Assessment

by

Dr. Tim Mulligan, PhD
Emeritus Research Scientist
3876 Yellow Point Road
Ladysmith, British Columbia, Canada V9C 1E9

14 February 2011

Contract IHP 11-059 with the Alaska Department of Fish and Game, Division of Sport Fish

Overview of the problem

Although many riverine acoustic monitoring sites are operating, both in Alaska and elsewhere, the vast majority of them produce estimates of the total number of migrating fish per time interval. They do not attempt to differentiate by species when there is a mixture of species present at the same time. The requirement to estimate the species composition greatly increases the complexity of the monitoring program. When this is combined with the fact that sockeye typically outnumber Chinook in the river by more than an order of magnitude, it makes the resulting task more difficult.

In order to identify the species composition in the Kenai, acoustic measurements have been used to estimate the size (specifically the length) of each fish. If there were no overlap in the length distribution between the two species and if acoustic data could determine length with high precision, this would be a straightforward task. Unfortunately that is not the case. There is overlap in the length distributions for the two species and the relationship between the acoustic data and fish length has substantial error. Thus, the problem is how to obtain accurate species composition estimates from the data that can be obtained.

Background

Acoustic techniques are non-invasive and therefore do not disturb the fish. Acoustic data acquisition can be automated and thus reduce manpower requirements. In addition, the ability to store data allows reanalysis, should that become necessary. Data analysis can be either manual or automated. Manual analysis is difficult to improve upon if the analyst is skilled. If more than one analyst is used, the potential for inconsistency may increase. Automated analysis is faster and more consistent.

Unfortunately there are disadvantages to acoustic measurements. 1) Acoustic measurements are highly dependent on the aspect angle, i.e. the angle between the fish and the acoustic beam. As fish swim upstream, this angle typically changes. The result is that side-looking acoustic data are much more variable than the more typical acoustic data which are down-looking. 2) The accuracy of acoustically estimated fish size in the Kenai River has relied on measurements from tethered fish. Because the tethered fish do not behave like free-swimming fish, these measurements may not be representative. 3) All acoustic measurements have an upper limit of fish density beyond which it is not possible to tell how many fish are in the beam.

Kenai River documents reviewed

The following documents were reviewed as background information during the preparation of this report:

Journal Publications:

Burwen, D. L., S. J. Fleischman, and J. D. Miller. 2010. Accuracy and precision of manual fish length measurements from DIDSON sonar images. Transactions of the American Fisheries Society, 139:1306-1314.

Burwen, Debby L. P. A. Nealson; S. J. Fleischman; T. J. Mulligan; J. K. Horne. 2007. The complexity of narrowband echo envelopes as a function of fish side-aspect angle. ICES Journal of Marine Science, 64: 1066-1074.

Burwen, D. L., S. J. Fleischman, J. D. Miller, M. E. Jensen. 2003. Time-based signal characteristics as predictors of fish size and species for a side-looking hydroacoustic application in a river. ICES Journal of Marine Science. Volume 60, Issue 3, Pages: 662-668

Burwen, D. L. and S. J. Fleischman. 1998. Evaluation of side-aspect target strength and pulse width as hydroacoustic discriminators of fish species in rivers. Canadian Journal of Fisheries and Aquatic Sciences. Volume 55, Number 11, Pages: 2492-2502.

Fleischman, S. J. and D. L. Burwen. 2003. Mixture models for the species apportionment of hydroacoustic data, with echo-envelope length as the discriminatory variable, ICES Journal of Marine Science. Volume 60, Issue 3, Pages: 592-598.

Mueller, A. M., D. L. Burwen, K. Boswell, and T. K. Mulligan. 2010. Tail Beat Patterns in DIDSON Echograms and their Potential Use for Species Identification and Bioenergetics Studies. Transactions of the American Fisheries Society, 139:900-910.

Eggers, D. M., P. A. Skvorc II, and D. L. Burwen. 1995. Abundance estimates of chinook salmon in the Kenai River using dual-beam sonar. Alaska Fishery Research Bulletin 2(1): 1-22. Alaska Department of Fish and Game, Juneau.

Eggers, D. M. 1994. On the discrimination of sockeye and chinook salmon in the Kenai River based on target strength determined with 420 kHz dual-beam sonar. Alaska Fishery Research Bulletin 1(2): 125-139. Alaska Department of Fish and Game, Juneau.

Presentations:

Burwen, D. L., R. Begich. 2011. Kenai River King Salmon: Sonar and Management. Presentation to the Alaska Board of Fisheries (RC#4, Tab5).

Miller, J. D. 2011. Sonar 101 – A presentation to the Alaska Board of Fisheries Working Group. A basic introduction to riverine sonar in Alaska. October 2010.

Strengths of current acoustic methods

Historic progress

Chinook salmon have been observed at the acoustic site over a 30-year period. During this time the acoustic hardware has changed from dual-beam to split-beam as advances in instrumentation were developed. In addition, the analysis of the data began by using the target strength as a surrogate for fish length and progressed to demonstrating that the variation in the echo signal width (ELSD) was an improved estimator of fish length. The current status of the program involves yet another proposed change in both hardware

and analytic method. The new hardware (DIDSON) has been tested in the Kenai River since 2002. During the time since 2002, there have been advances in both the hardware and analytic software available from the manufacturer. Many of these changes were the result of experience gained by tests on the Kenai River and represent significant improvements to both the quality of the data and the ease of analysis.

Analysis using statistical modeling

I applaud the use of a statistical model that combines the acoustic estimates with other data, such as the test fishing data. I believe that it is important not just to compare estimates from different sources, but also to combine them in order to achieve more accuracy than can be achieved by any single data set.

Publication of results

The program has a very good publication record. The publications include both internal ADF&G reports and articles in peer reviewed scientific journals. The latter can only attest to the validity of the methods used and the results obtained.

DIDSON

The program is currently evaluating the switch from a split-beam system to the DIDSON sonar. The ease with which anyone can relate to the DIDSON video should increase public acceptance of the data. My experience with both of these instruments leads me to believe that such a change will make a *significant improvement* in the Chinook estimates. Because the DIDSON is an imaging sonar, it produces an image of the fish for each frame of data. These images lead to a direct measurement of fish length, in contrast to the indirect methods required for split-beam data. The ability to remove the background from the DIDSON image and leave only the moving targets enables downstream moving targets to be identified as either debris or fish. This is not possible with split-beam data. Since the DIDSON beam is wider than the split-beam that has been used, its horizontal and vertical coverage is greater, which results in better length estimates for fish at close range. In addition, it becomes considerably easier to distinguish multiple targets from single targets (see appendix) so that higher fish density can be resolved than is possible with split-beam. Furthermore, complex fish behavior, e.g., the DIDSON example of two Chinook pinwheeling, becomes easily identified rather than being hopelessly confusing. It must still be recognized that these images are range dependent, since the beam width, and thus the image pixel width, increases linearly with range. Irrespective of this effect, the DIDSON should make the job much easier. Finally, DIDSON data, unlike those from the HTI split-beam system formerly used, can be stored in unprocessed form. This allows comparison of the effect of different processing procedures. It also allows data from previous years to be re-examined if new analytic procedures are developed.

In addition to the advantages mentioned above, there are other potential species related estimates that may be possible to get from DIDSON data. These estimates are not possible without an imaging sonar. There is a suggestion that Chinook and sockeye in the Kenai River may have different tailbeat frequencies (Mueller et al., 2010). It is also possible that the swimming motion differs between these two species, with Chinook using more of the body, while sockeye use primarily the tail. Both of these techniques are based on the image of the fish and how it changes from frame to frame as the fish swims.

Weaknesses of current methods

Spatial distribution of migrating salmon

The assumption that the vast majority of salmon migrate very close to the river bottom may not always hold. For example, in 2010 fish were detected migrating above the bottom-oriented aim and behind the offshore transducer. By rotating the DIDSON around the roll axis by 90°, it is easy to produce data that show the river bottom and the vertical position of the migrating fish. This would demonstrate whether or not a significant portion of fish migrated above the current aim. A similar procedure could be adopted to check for migrating fish behind the offshore transducer. In this case, rotating the transducer around the yaw axis by 180° will allow sampling from the transducer back to the river bank. Alternatively, additional DIDSON systems may be used to cover these areas and avoid the need to rotate a single sonar. An advantage of using an additional DIDSON looking at the water between the river bank and the offshore transducer is that the images (especially for fish quite close to the river bank) would have better resolution and would be free of multi-path interference anomalies.

Censoring of schooling fish

Censoring has been used in the past to ignore data that are dominated by fish migrating in schools. DIDSON data should allow the examination of these censored data for the presence of large Chinook. (Any small Chinook will be indistinguishable from the schooling sockeye.) Thus, at least for large Chinook, it would be possible to test the hypothesis that the same migration rate was occurring for both censored and non-censored data. If the migration rate is significantly different, censoring should be eliminated.

Tidal variation at acoustic site

The large tidal variation at the site exacerbates the problem of the vertical fish distribution. When the tide is high, the data come from only a small fraction of the water column. In addition, the test fishing at the site always takes place at the same tidal stage, which may not be representative of the stages not sampled. Thus both the acoustic and catch data are affected. If an alternative site could be found above tidal influence (or with greatly reduced tidal influence) the Chinook estimates might improve and would surely be more defendable.

Recommendations

1) Stop using split-beat target strength. This includes both its use for management of the fisheries and also its distribution to the public. Target strength from split-beam measurements has the poorest relationship to fish length of the three length estimators examined. The work at the Kenai River site has already adequately demonstrated the weaknesses of using target strength to estimate fish length and the superiority of using length measurements from DIDSON fish images.

2) Replace the split-beam with DIDSON (or its successor) as soon as possible. The DIDSON imaging sonar gives the ability to measure fish length directly. In addition, its superior spatial resolution allows an understanding of complex fish behavior and the ability to resolve closely spaced fish.

3) Move the acoustic monitoring site to a location above tidal influence. The large variation in water depth and current velocity at the present site increases the possibility that fish may change their distribution in the water column as these variables change.

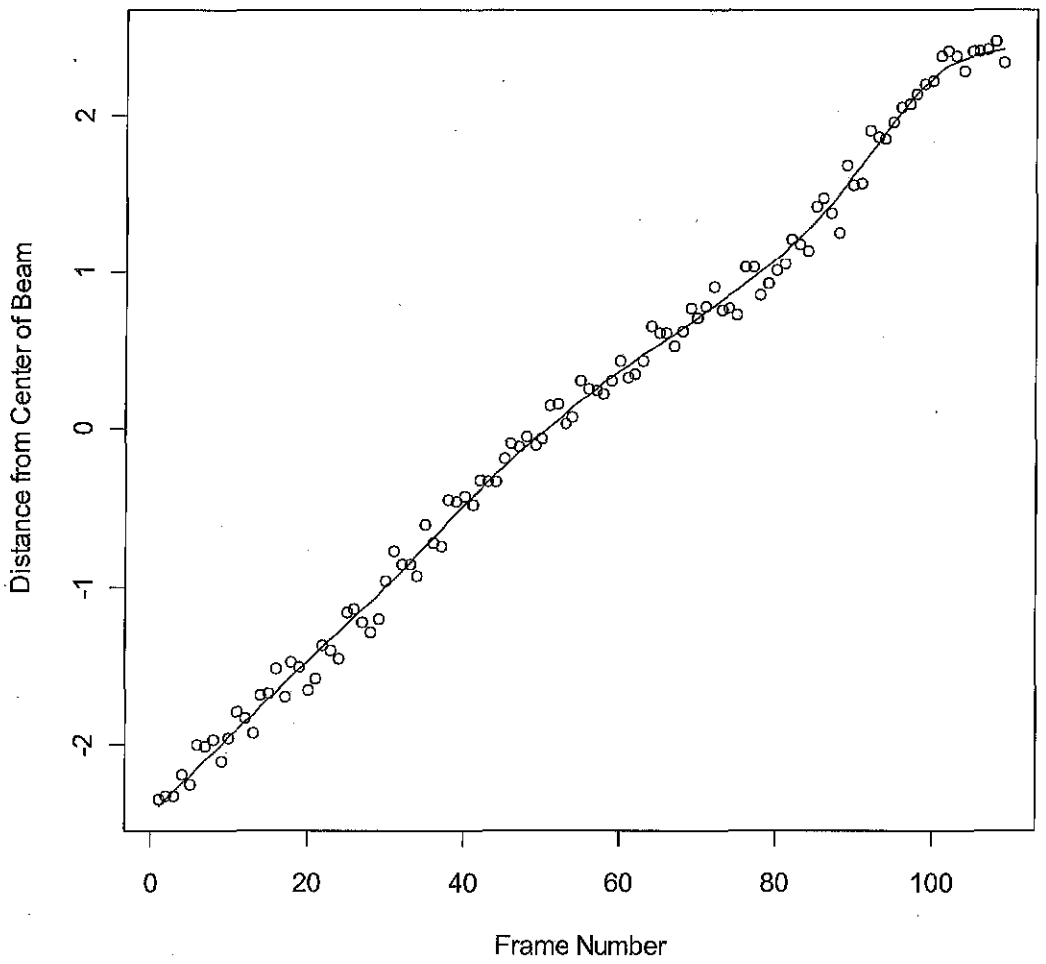
4) Use a programmable three-axis rotator to look periodically at the whole water column. (This could also be accomplished by use of additional DIDSON systems. For example, one could place a DIDSON close to the river bank that looked at the water column behind the offshore transducer.) These periodic measurements should be done several times per day so that, if the fish distribution has changed, the data acquisition can change to accommodate it.

5) Look for the presence of large Chinook in the data that are presently censored. The present assumption is that Chinook migrate at the same rate for both censored and uncensored data. If the number of large Chinook is significantly different between these two types of data, then censoring should be eliminated.

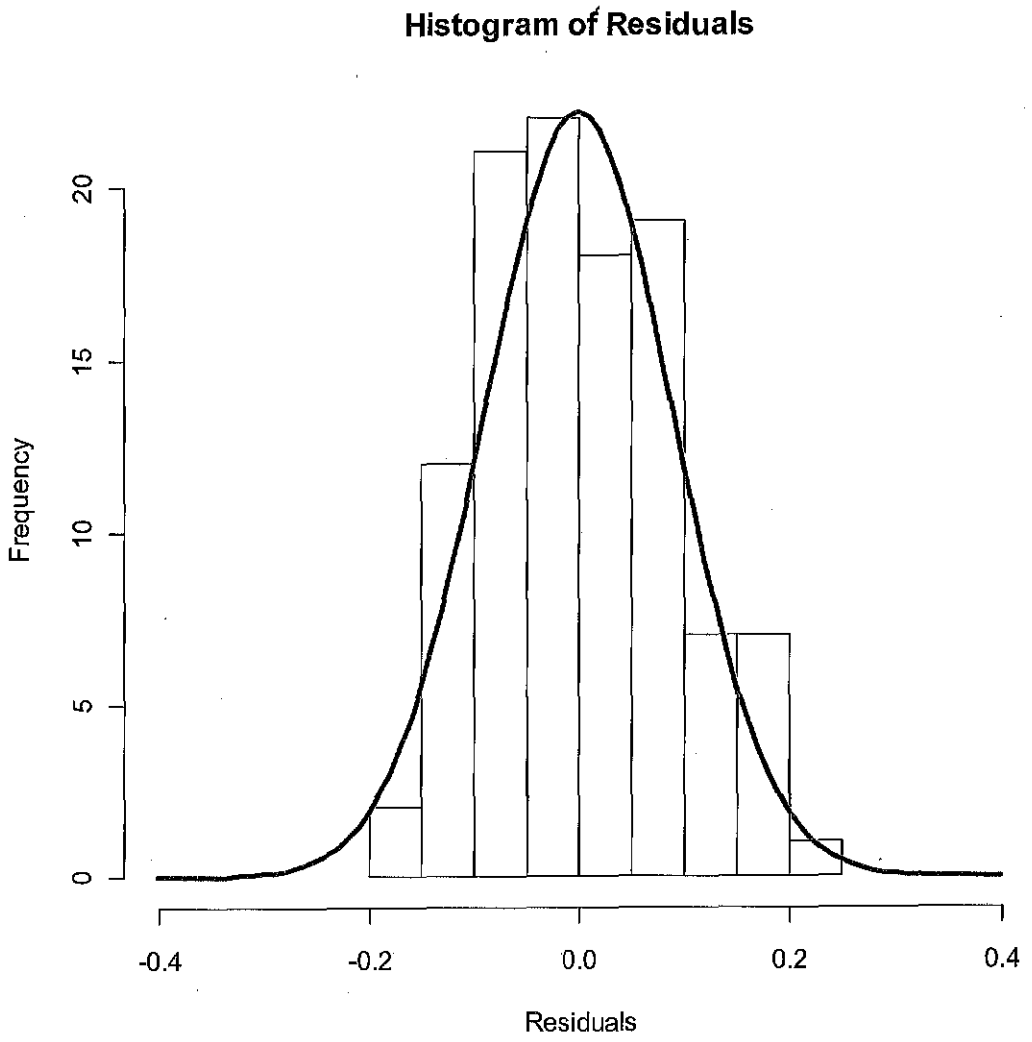
6) Determine the vertical coverage of the DIDSON for each configuration you use. Because the DIDSON does not measure the vertical position of fish, one must either rotate the transducer by 90° or use multiple vertically separated sampling strata in order to cover the entire water column. The nominal vertical beam width given by the manufacturer is not adequate to determine how far from the center of the beam one will be able to detect fish. The larger the fish, the greater will be the actual vertical (and horizontal) beam angles. Knowledge of these angles translates to knowing what fraction of the water column is being observed.

Appendix

I examined the data Debby sent me that contained target locations for a single migrating salmon in the Kenai River as recorded with side-by side split-beam and DIDSON acoustic systems. The programming language I used for this examination was R, which contains many features that make it attractive for statistical analysis. The target I examined was an isolated fish at ~20m range. I first examined the horizontal position of the fish in the DIDSON beam and plotted that position vs. frame number. Next I fit a smoothed line through these two-dimensional data. The results are shown in the following figure.

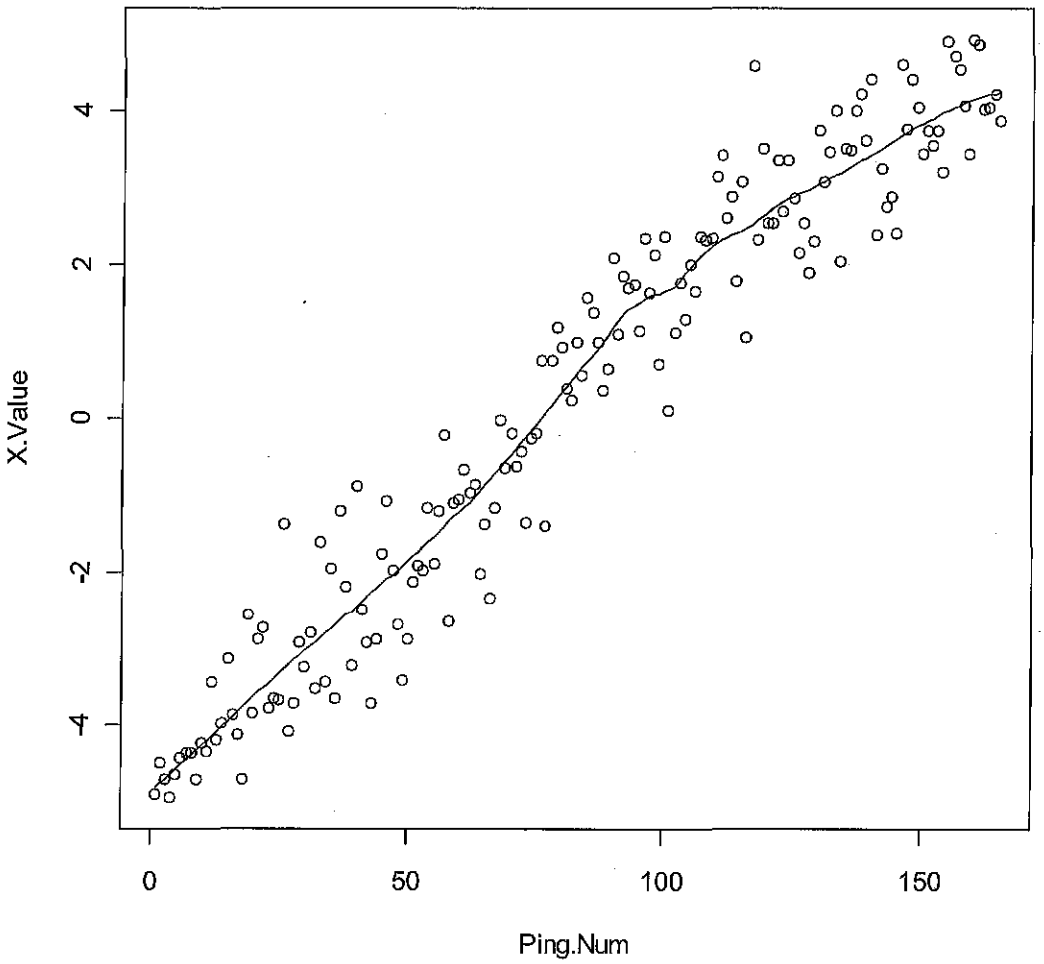


Next I looked at the residuals between the data points and the line of smoothed values, to obtain an estimate of the error in the target location. These results are shown in the next figure.

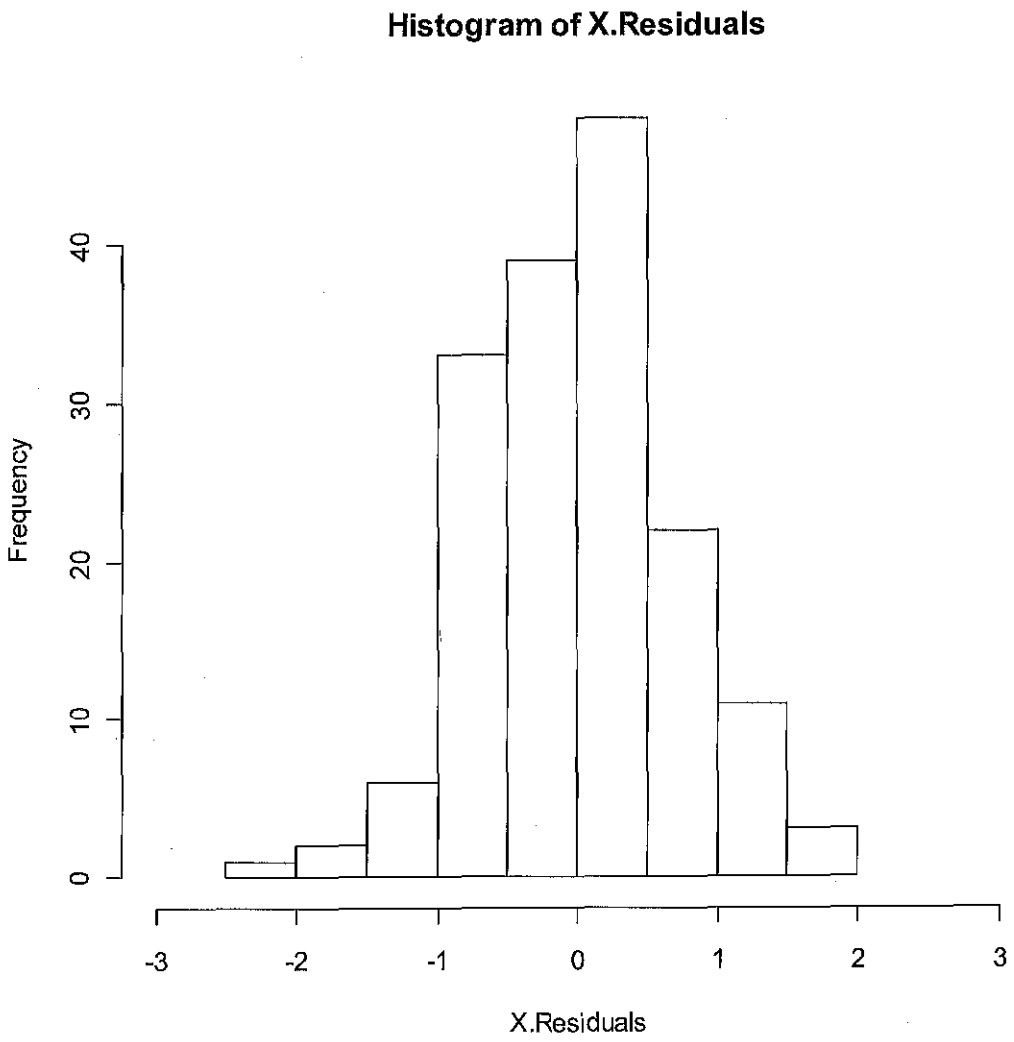


The horizontal position residuals are approximately normally distributed with mean of 0.0009m and standard deviation of 0.09m.

Next I repeated the same two steps as above using the split-beam horizontal position data. The data and resultant smoothed line are shown below.

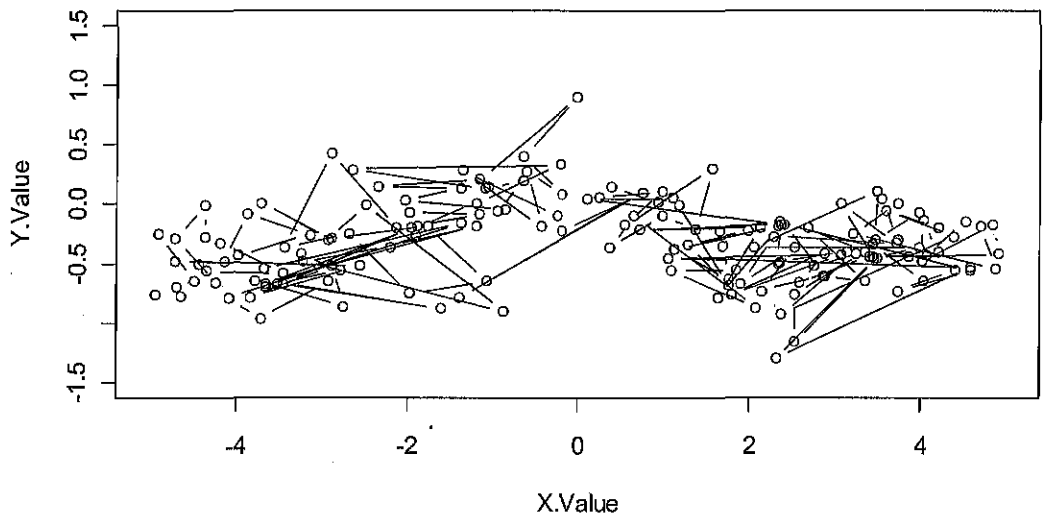


The histogram of residuals for these data is shown in the following figure:



These appear to be slightly skewed and have a mean of 0.006m with standard deviation of 0.69m. Thus the scatter in these residuals is ~7.7 times larger than those from the DIDSON.

The two dimensional data from the split-beam is plotted in the figure below. The data points are joined by the line that connects data from adjacent ping number. (When adjacent points are close together, the line is not drawn.)



One can see from this plot that the combined scatter is substantial. It is obvious that there is movement from negative towards more positive X-values, but the scatter in the points makes anything else difficult to estimate.

My point in looking at these data is to highlight the difficulty of recognizing the difference between the case of a single target in the beam and the case in which there is more than one target at approximately the same range from the transducer. With split-beam data the case of multiple, unresolved targets is detected by unusually large random scatter in the target position data. When one starts with data that already have significant scatter, this increase is more difficult to recognize. Thus, for split-beam data two or more fish may be interpreted as a single fish; whereas, for the DIDSON data a much higher fish density is possible before multiple fish recognition deteriorates.

RC 19

January 27, 2011

Evaluation of the fisheries management and stock assessment of the Kenai River Chinook sport fishery

By: Milo D. Adkison, PhD

For: Charles O. Swanton
Director, Division of Sport Fish
Alaska Department of Fish & Game

Contract IHP 11-060 with the Alaska Department of Fish and Game, Division of Sport Fish

Tasks:

a. Evaluate the current Kenai River Chinook salmon inseason stock assessment program.
b. Evaluate management decisions, particularly during the past three (3) years, based on assessment data and uncertainties of the data.
c. Analyze the risk of significant negative impact(s) on providing for sustained yield of Kenai River Chinook salmon based on the current regulatory structure guiding fisheries management and uncertainties in stock assessment data used inseason to estimate fish abundance.
d. Recommend future direction in data to collect and/or analyses/modeling of data to reduce risks in providing for sustained yield of Kenai River Chinook salmon.
e. Request and review peer-reviewed scientific publication articles, department reports, data and other information from, and consult with as necessary, Kenai River Chinook salmon assessment project biologists to properly evaluate the current assessment program and make recommendations for future direction.
f. Consider recent advances in the scientific and technical field of knowledge of assessing and estimating/modeling inseason abundance of salmon in the evaluation and recommendations.
g. Provide a final written report of review findings, evaluation and recommendations. Final written report is due to the department by 31 January 2011.

Findings:

a) *Stock assessment*.- In the very near future, in-season stock assessment for Kenai River Chinook salmon could be one of the most reliable programs anywhere. The DIDSON sonar technology being implemented will allow accurate estimation of the total number of salmon entering the river, as well as a count of the number of fish large enough that they are unambiguously Chinook salmon. The existing netting program can be used to estimate the ratio of small to large Chinook, allowing estimation of the total number of Chinook. The intensive creel survey program estimates harvest, so Chinook escapements can be calculated by subtracting harvest estimates from estimates of Chinook entering the river.

In-river genetic samples and a few, but increasing, number of weirs will permit post-season estimation of the escapement of some substocks, as well as a noisy but independent estimate of total Chinook entry and escapement. Genetics samples from commercial fisheries will produce improved estimates of Kenai-origin catches, leading to improved estimates of the total return produced by differing levels of escapement, and thus to improved escapement goals. In sum, the quality of the data available for future management of these Chinook stocks is quite good.

In the short term, recent studies suggesting that historical estimates of Chinook from split-beam sonar are unreliable has resulted in ambiguity about what escapement goals are appropriate for these stocks. Only one nearly complete year of DIDSON count data is available; returns in this year

(2010) are felt to be at the low end of what is desirable and has been seen historically. However, several indices of Chinook abundance, which appear fairly reliable because of their concordance and the way they are collected, in conjunction with DIDSON data, should allow estimation of Chinook abundance back to 2002 at least. This should be enough of a time series to allow at least an SEG to be calculated, providing managers a reasonable target.

b) *Management decisions*.- If the sonar estimates were to be taken to be accurate, late run fisheries management since 1986 functionally appears to have been harvesting a roughly constant fraction of the run. Based on Tables 7 and 8 in Begich and Pawluk (2010), the late run stocks are harvested at a rate of 30% of the in-river return and 48% of the overall return. This phenomenon of seeing a constant harvest fraction emerge from a nominal constant escapement strategy is quite common in salmon fisheries given the difficulty in determining run strength in-season. The harvest fraction on the late run in 2009 was essentially unchanged despite a fairly weak run, but in 2010 managers dramatically reduced the nominal harvest rate in response to evidence the sonar counts were misleadingly high. Harvest rates on the early stocks ratcheted down in the late 1990's and have averaged roughly 20% since. Significantly lower harvest rates were achieved for the weak runs seen in both 2009 and 2010.

In recent years, managers have been challenged by some weak returns and a widely-publicized sonar estimate of abundance that they knew was flawed and biased high. Nonetheless, with the probable exception of the 2009 late run, they've been able to maintain escapements within goal ranges as estimated using the tools available to them.

c) *Risk of significant negative impacts*.- Current management practices have sustained the run despite the recently-revealed problems with abundance estimates. Harvest rates on the early run are quite low, and several management measures (bag and season limits, size limits, closed areas, the August closure) limit the harvest rate that can be achieved on late run fish. A significant increase in angler effort could increase the harvest rate, although this is unlikely if the return of Chinook is low. An increase in commercial set net fishing time in response to an abundant sockeye return is also possible, but managers have the authority to close these fisheries in response to a weak Chinook run. The current suite of management tools employed with the aim of maintaining escapements in the upper half of revised historical escapement estimates, consistent with SEG-based management elsewhere in the state, should ensure sustainability of the stocks until more reliable data accumulate.

d) Recommendations.-

Abundance Estimation

Modify the DIDSON sonar program to create an unbiased estimator of fish passage.- All of the current estimators of abundance based on the split beam sonar appear to be sensitive to factors (probably the behavior of and the characteristics of the Chinook and sockeye) that can vary among years. This problem could extend to the current DIDSON sonar configuration, which because of its location and operation (there are several blind spots) is vulnerable to changes in the spatial distribution of the migrating fish.

A new, tide-free location that permitted the entire water column to be continually covered is one possibility, but there is a limited scope for moving the sonar site upriver before running into spawning areas for late run Chinook. A better possibility is to use the existing location, adding additional DIDSON units and/or occasionally changing the orientation of the existing units to periodically sample the portion of the water column currently left out. Sonar specialists with ADF&G cite technical challenges but think this should be possible with addition of additional DIDSON units and/or changes in operation of the existing units.

Possible bias in sonar counts should be investigated.- Managers have expressed skepticism about some sonar counts they felt were low, including recent DIDSON counts. These counts combined with creel survey-based harvest estimates imply high harvest rates they feel are implausible, given the large fraction of fish that are immune to harvest because of slot limits. If their intuition is correct, the bias in DIDSON counts is most likely caused by significant numbers of Chinook migrating through areas not covered by sonar.

Split-beam sonar estimates should no longer be used for management.- Split beam sonar target strengths, and all transformations of these data employed so far, have been found unreliable in separating Chinook from sockeye. There has been a long history of methods being developed to differentiate Chinook from sockeye from sonar data, these methods being found inadequate and subsequently revised, and the improved methods eventually themselves failing a validation test. Staff intimately involved with sonar estimates believe that current methods were accurate in the past, but that the spatial distribution of the fish has changed in recent years, making separation of the two species more difficult. The ELSD transformation has been in rough agreement with other indices of abundance over the period 2002-2009, but was higher in 2010 when Chinook stocks were low by every other measure. Paired daily estimates of large fish abundance show ELSD roughly 2/3 higher than DIDSON values, but much closer to the DIDSON values than the TS-based estimates.

Management based on split-beam data causes several problems. It's currently constraining development of DIDSON methods by tying up skilled staff in processing its data, and by constraining DIDSON operations to match that of the split beam, precluding tests of alternative configurations and deployments. It causes unnecessary conflict with the public when, as in 2010, it produces optimistic estimates of run strength in conflict with management actions based on more reliable indices. The cost of operation is significant, and these funds could be allocated to improving the DIDSON sonar.

There would be value in a short continuation of operation of split beam sonar for calibration with the DIDSON sonar, with the ultimate goal of obtaining unbiased Chinook estimates from historical split-beam data. However, this would require evidence that a strong relationship exists, plus the historical

data necessary to retrospectively apply the calibration methodology. Several people with extensive sonar experience were somewhat skeptical of this possibility. One potential approach would be investigating whether the rate of misclassification of sockeye as Chinook is related to the abundance of sockeye.

The net program should be continued.- The netting program constitutes a valuable tool for calibrating current and future DIDSON data. Nine years of daily data, consistently and carefully collected, provide valuable indices of Chinook and sockeye abundance and size distribution. The netting program follows a consistent protocol, but because of logistical constraints is conducted in only a portion of the river's cross-section, and only during a single tide stage. Although the two mesh sizes employed were chosen to minimize problems of selectivity, it is still possible that some combination of the properties of the gear and the sampling protocols results in differential catch efficiencies for the two salmon species, or for size classes within the species.

However, by comparing the netting program catch rates to DIDSON sonar data, where the abundance of large Chinook and the total abundance of fish (mostly sockeye) are known, coefficients for scaling net catches to the abundance of large Chinook and to sockeye can be calculated. This should allow estimation of the abundance of large Chinook back through at least 2002. Reasonable assumptions about the relative catchability of small Chinook versus equally sized sockeye, or small versus large Chinook, would then allow estimation of the total Chinook return.

It's possible that this program could be scaled back in the future. As data accumulate from paired operation of the DIDSON sonar and netting program, power analyses may show that adequate calibration can be achieved with less frequent net sampling.

DIDSON data generation should be made robust.- A multi-day loss of DIDSON data would create large handicaps for in-season management and post-season assessment. Contingency plans should be created to ensure that failures of or loss of equipment can be overcome fairly quickly.

The visual images DIDSON provides reduce the possibility that problems will arise without being discovered. However, staff have encountered one problem that could lead to biased data being collected without an obvious signal that something was wrong – a focusing problem resulted in biased fish length estimates. To avoid this and other unexpected problems that could compromise large chunks of data, validation tests should be performed periodically during the season.

The in-season creel survey should be continued. – This survey appears to be well-designed, and generates timely in-season catch and catch rate data vital to managers. Meeting the escapement goal requires that both in-river arrivals (sonar) and removals (creel survey) be accurately assessed.

Management Targets for the Short Term

Index-based indicators of escapement. Several indices of abundance are available for both the early and late runs of Chinook salmon (one will be lost and one modified if the split-beam sonar is discontinued). These indices demonstrate a high degree of concordance, creating confidence that they are reliable

indicators of the relative abundance of Chinook salmon. The single absolute index of abundance, calculated by multiplying split-beam sonar counts by the fraction of Chinook in a gill net sample, agreed with DIDSON estimates of Chinook based on fish length in 2010, the sole year DIDSON numbers were available. About nine years of data are available for most of these indices.

In and of themselves, indices are somewhat lacking as targets for management, since they do not account for and are not directly comparable to the harvest estimates. For 2011, managers could use the indices as qualitative indicators of the strength of the run and adjust management measures accordingly. This would conflict with the current management plans, which trigger management actions based on projected escapement numbers.

Daily counts from the DIDSON program in the 2009 and 2010 trials might be sufficient to calibrate these indices to units of salmon abundance. As the DIDSON trials only monitored the same, incomplete subset of the stream cross-section as split-beam sonar, these abundance estimates would be biased low. Split-beam estimates used in the past suffered from this same bias; however, it was probably more than offset by the upwards bias from misallocation of sockeye salmon to the Chinook estimates.

If the 2011 DIDSON program sampled the entire river cross-section, a more robust calibration could be done. Using these calibrations, indices could be translated to Chinook counts at least back to 2002. Because each individual index is susceptible to bias from various factors (e.g., the set net fishery catch could be biased high if other Chinook stocks were strong, or in-river test netting CPUE could be biased if river conditions resulted in unusual migratory behaviors with respect to tide or orientation relative to the riverbanks), it is possible that any single index could be misleading in a given year. Estimates from individual indices could be combined using some sort of robust averaging procedure, perhaps as simple as using the median value.

These reconstructed counts should be sufficient to set an escapement target, at least using an SEG standard. While such a strategy may not maximize sport harvest opportunities, it should suffice to ensure the sustainability of the Chinook stocks until the accumulation of more reliable data allows more sophisticated estimation of optimal escapement levels.

Combining data. Habitat-based models (e.g., Liermann et al. 2010) could be used to improve estimation of the stock-recruitment relationship by providing informative priors of capacity.

SSART and genetics data.- The combination of the genetic data and the SSART model will be useful for allocating escapement and harvest – both in-river sport and Cook Inlet commercial - to different substocks. This will be especially valuable for the early run, where some population substructure has been demonstrated. Additional weirs being contemplated will improve allocation accuracy. It will also be useful in determining the allocation of fish to the different runs during the late June/early July period of overlap. These data will only be available post-season, and their precision will be lower than that of counts obtained from sonar.

Management targets based on counts of large Chinook only should be considered.- DIDSON technology allows straightforward enumeration of the number of large fish passing the sonar. Large fish should

constitute a strong index of the reproductive potential of the Chinook escapement. Small fish are predominantly male, and small females have fewer, smaller eggs and may construct less robust redds.

Using the escapement of large Chinook as a management target would necessitate that in-river harvest be split into large and small Chinook. ADF&G staff feel that the creel program collects the size data that would make this possible. Basing management targets on easily-counted large Chinook would reduce uncertainties due to extrapolating from other incomplete indices of abundance, and eliminate the need for staff to produce such extrapolations on short deadlines during the season.

Inseason Management

Inseason management options.- In the interest of predictability, current management consists of a wide goal range and a few possible management actions, most of which are infrequently applied. Predictability is quite important to the public, because many plan trips well in advance. This advance planning is especially important to the guiding industry, with many clients traveling from out-of-state. Although the management plan often results in no in-season regulatory actions, managers can and do occasionally take actions that significantly affect harvest rates.

Managers feel the harvest regulations are quite conservative, and that as a consequence harvest rates are naturally constrained. The daily bag limit is 1 Chinook salmon and a seasonal limit of 2 is imposed. Slot limits (prohibiting retention of fish from 46" to 55") protect a significant fraction of the early run. A fairly rigorous study estimated the hook-and-release mortality rate at about 8%.

The tributaries are closed, as well as sections of the mainstem at the mouths of the Slikok, Funny, Moose, and Killey Rivers. These areas provide a refuge for the tributary spawning early run fish, limiting the harvest rate they can experience. Late-run fish have less of a spatial refuge, but the July 31 closure (which may be extended for a short period if abundance is high) limits the length of time they experience fishing pressure, particularly for those fish arriving in the latter half of the season.

Only a single hook may be used. For the early run, the season starts with bait prohibited, which managers permit later if inseason data suggests the escapement goal can be made. The late run starts with bait permitted. Bait can be prohibited, and for very low runs the fishery can be closed, which also automatically closes commercial sockeye fisheries in parts of Cook Inlet. Other management actions, such as prohibiting catch retention, closing additional areas, or reducing fishing time, are potentially available.

Distinguishing late from weak and early from strong runs. The biggest risk to meeting escapement goals is a weak run with unusually early timing, such that managers do not become aware of the poor return in time to restrict fisheries and prevent an overharvest. As in most salmon fisheries, distinguishing whether the run is strong or weak or whether the timing is merely unusual is the principal source of uncertainty managers face. As an example, in the early-run fishery in 2010 unusual run timing led managers to sequentially close, then open to catch-and-release, then allow retention, then allow bait. In addition to the conservation issues, these sorts of sudden changes in regulations cause problems for and with the public.

A reliable indicator of run timing would greatly improve the ability of managers to meet escapement goals and minimize abrupt in-season management changes. Managers identified a couple of indicators (presence or absence of large fish in early returns, catch rates in some commercial fisheries) that they use in a qualitative fashion as signals of run strength. Biometric support should be provided to try to validate and to develop new early-season indicators of the timing of the Chinook runs.

Adequacy of in-season management.- Managers have a multitude of tools available to control the amount of harvest in response to year-to-year fluctuations in the number of fish returning to the river. Managers using the available tools have nominally been able to meet the current escapement goals even in the face of recent weak returns, although they are skeptical of the sonar data on which these calculations are based and feel the true escapements are probably lower than stated.

Estimated in-river and total harvest rates are quite small for early-run Chinook, but more significant for the late run. These estimates have been biased downwards by mistaken identification of sockeye as Chinook and biased upwards by migration of Chinook through the cross-section of the river not covered by sonar. It is quite likely that the more accurate DIDSON-based estimates of Chinook passage will be lower than those that would have been estimated using the previous technology. In addition, Chinook may be experiencing a period of poor productivity. Although managers will probably be able to meet their escapement goals, in the next few years restrictions on the sport fishery are likely to be more frequent than in the past.

Documents reviewed:

ADF&G Divisions of Sport Fish and Commercial Fisheries. A review of Kenai River Chinook salmon indices of abundance and inseason assessment, 1980-2010. Draft 11/19/2010.

ADF&G Divisions of Sport Fish. 2010. 2010 sport fishing regulations summary: Southcentral Alaska.

Begich, R.N., W.D. Templin, A.W. Barclay, and L.W. Seeb. 2010. Development of microsatellite genetic markers for Kenai River Chinook salmon. ADF&G, Fishery Data Series No. 10-38, Anchorage.

Begich, R.N., and J.A.Pawluk. 2010. 2008-2010 Recreational Fisheries Overview and Historical Information for North Kenai Peninsula: Fisheries under Consideration by the Alaska Board of Fisheries, February 2011. Alaska Department of Fish and Game, Fishery Management Report No. 10-51, Anchorage.

Bendock, T.N., and M. Alexandersdottir. 1992. Mortality and movement behavior of hooked-and-released Chinook salmon in the Kenai River recreational fishery, 1989-1991. Alaska Department of Fish and Game, Fishery Manuscript no. 92-2, Anchorage.

Bernard, D.R., A.E. Bingham, and M. Alexandersdottir. 1998. The mechanics of onsite creel surveys in Alaska. SP-98-1, Anchorage, AK.

Bromaghin, J.F., K.S. Gates, and D.E. Palmer. 2010. A likelihood framework for joint estimation of salmon abundance and migratory timing using telemetric mark-recapture. North American Journal of Fisheries Management 30:1385-1394.

Burwen, D. L., Nealson, P. A., Fleischman, S. J., Mulligan, T. J., and J. K. Horne. 2007. The complexity of narrowband echo envelopes as a function of fish side-aspect angle. ICES J. of Marine Science, 64: 1066-1074..

Burwen, D. L., S. J. Fleischman, and J. D. Miller. 2010. Accuracy and precision of salmon length estimates taken from DIDSON sonar images. Transactions of the American Fisheries Society 139:1306-1314.

Clark, J.H, A. McGregor, R.D. Mecum, P. Krasnowski, and A.M. Carroll.2006.The commercial salmon fishery in Alaska. Alaska Fishery Research Bulletin 12:1-146.

Eskelin, A. 2010. Chinook salmon creel survey and inriver gillnetting study, lower Kenai River, Alaska, 2007. ADF&G, Fishery Data Series No. 10-63, Anchorage.

Fleischman, S. J., and D. L. Burwen. 2003. Mixture models for the species apportionment of hydroacoustic data, with echo-envelope length as the discriminatory variable. ICES J Marine Science 60: 592-598.

Jennings, G. B.; Sundet, K., and A. E. Bingham. 2010. Estimates of Participation, Catch, and Harvest in Alaska Sport Fisheries during 2008. Alaska Department of Fish and Game, Fishery Data Series No. 10-22, Anchorage. http://www.sf.adfg.state.ak.us/FedAidPDFs/fds10-22.pdf

Liermann, M.C., R. Sharma, and C.K. Parken. 2010. Using accessible watershed size to predict management parameters for Chinook salmon, Oncorhynchus tshawytscha, populations with little or no spawner-recruit data: a Bayesian hierarchical modeling approach. Fisheries Management and Ecology 17:40-51.

McKinley, T.R., and S.J. Fleischman. 2010a. Stock assessment of early-run Chinook salmon in the Kenai River, 2002-2006. ADF&G, Fishery Data Series No. 10-19, Anchorage.

McKinley, T.R., and S.J. Fleischman. 2010b. Draft stock assessment of late-run Chinook salmon in the Kenai River, 1999-2006. ADF&G, Anchorage.

Miller, J. D., D. L. Burwen, and S. J. Fleischman. In prep d. Estimates of Chinook salmon abundance in the Kenai River using split-beam sonar, 2010. Alaska Department of Fish and Game, Fishery Data Series No. YY-xx, Anchorage.

Mueller, A., D. L. Burwen, K. M. Boswell, and T. J. Mulligan. 2010. Tail beat patterns in dual-frequency identification sonar echograms and their potential use for species identification and bioenergetics studies. Transactions of the American Fisheries Society 139:900–910.

Sheilds, P. 2010. Upper Cook Inlet commercial fisheries annual management report, 2009. ADF&G, Fishery Management Report No. 10-27, Anchorage.

ADF&G staff consulted:

Robert Begich, Upper Kenai Management Biologist
Debbie Burwen, Regional Sonar Research and Development Coordinator
Jack Erickson, Regional Fisheries Research Coordinator
Steve Fleischman, Biometrician III
Jim Hasbrouck, Regional Supervisor
Tim McKinley, Fishery Biologist III
Jim Miller, Kenai Chinook Sonar Supervisor
Tom Vania, Regional Management Biologist

RC 20

Options for Amounts Reasonably Necessary for Subsistence Uses of Salmon: Tyonek Subdistrict and Yentna River

Prepared for the February–March 2011 Anchorage Board of Fisheries Meeting

by

Alaska Department of Fish and Game

February 2011

Alaska Department of Fish and Game

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Department of Fish and Game. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols

alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

all commonly-accepted abbreviations e.g., Mr., Mrs., AM, PM, etc.	
all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.	
Alaska Administrative Code	AAC
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures):	first three letters (Jan,...,Dec)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations

alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

OPTIONS FOR AMOUNTS REASONABLY NECESSARY FOR SUBSISTENCE USES OF SALMON: TYONEK SUBDISTRICT AND YENTNA RIVER;

PREPARED FOR THE FEBRUARY–MARCH 2011 ANCHORAGE BOARD OF FISHERIES MEETING

by

Alaska Department of Fish and Game, Juneau

Alaska Department of Fish and Game
1255 West 8th Street
Juneau, Alaska, 99811

February 2011

Alaska Department of Fish and Game,
P.O. Box 115526, Juneau, AK, 99811-5526, USA

This document should be cited as:
ADF&G (Alaska Department of Fish and Game). 2011. Options for amounts reasonably necessary for subsistence uses of salmon: Tyonek Subdistrict and Yentna River; prepared for the February–March 2011 Anchorage Board of Fisheries meeting. Alaska Department of Fish and Game, Juneau.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

This report provides options for amounts reasonably necessary for subsistence for consideration by the Alaska Board of Fisheries as it discusses proposals addressing the subsistence salmon fisheries in the Tyonek Subdistrict and the Yentna River, both in Upper Cook Inlet, Alaska. Both these fisheries are important for residents of Tyonek and Skwentna, as well as for subsistence fishers in Cook Inlet in general.

Key words: Subsistence fishing, Tyonek, Skwentna, Yentna River, sockeye salmon, king salmon, Chinook salmon, Board of Fisheries.

INTRODUCTION

This report has been prepared for the Alaska Board of Fisheries (BOF) for reference when considering proposals with implications for subsistence fisheries during its February–March 2011 meeting, especially proposals 102, 103, and 270. In order to maintain consistency with regulatory language, "king salmon" shall be used throughout this report to also mean "Chinook salmon."

Under AS 16.05.258 (a), the BOF is charged with identifying fish stocks, or portions of stocks, that "are customarily taken or used for subsistence." If a portion of these stocks can be harvested consistent with sustained yield principles, the BOF "shall determine the amount of the harvestable portion that is reasonably necessary for subsistence uses" [AS 16.05.258(b)]. This is called the amount reasonably necessary for subsistence, or an "ANS finding".

TYONEK SUBDISTRICT SUBSISTENCE SALMON FISHERY

The BOF has found that salmon in the waters of the Tyonek Subdistrict are customarily and traditionally taken or used for subsistence [5 AAC 01.566 (a)(1)(A)]. The BOF adopted an administrative ANS finding for this setnet fishery in November 1992 as part of its actions to comply with the provisions of the 1992 Alaska subsistence statute (ADF&G 1995;Holen and Fall 2011:17–25). The administrative ANS was expressed as a range for each salmon species based on the subsistence regulation review worksheets provided at the 1992 meeting, as well as on harvests reported by permit from 1980 through 1992. At that time, however, the ANS ranges were not adopted into regulation.

Following are 5 options for the BOF to consider should it choose to update the 1992 actions and adopt ANS ranges in regulation during its February–March 2011 meeting. The options were developed from harvests reported from returned permits only (Table 1). Options 1–4 include one suboption with ranges for each salmon species and one suboption with a range for king salmon and a range for all other salmon, for two primary reasons. First, research conducted by the Division of Subsistence, as well as public testimony at previous BOF meetings, has shown that the customary and traditional use pattern in the fishery is focused on king salmon (Fall et al. 1984; Fall 1989; Foster 1982; Stanek et al. 2007; Holen and Fall 2011:17–25). This research has shown that the pattern of use of king salmon is very distinct from those for the other 4 salmon species, none of which can be substituted for king salmon to support these traditional uses, due to such factors as run timing, average size, efficiency of harvest and processing, traditional products, and traditional knowledge. Second, the two-part season in regulation since 1980 was designed to provide reasonable subsistence fishing opportunities to harvest king salmon and, secondarily, other salmon (5 AAC 01.560). Because the current C&T finding in regulation for the Tyonek subdistrict is for "salmon," the board may also opt to revise the C&T finding.

The options and suboptions differ from each other in two ways: 1) the range of years upon which the ANS option or suboption is based, and 2) the manner in which the high and low point of the range is established. Some options and suboptions use statistical means and standard deviations from 1992 (when the current subsistence law was adopted) through 2009 or from 1980 (when the current set of regulations was established) through 2009. Some options and suboptions use the low and high reported harvests for 1992–2009 or 1980–2009.

For each option, a few outlier years with unrepresentative low king salmon harvests, below the administrative ANS range, were not included in calculations. It is unknown at this point why the harvests for the outlier years fell below these ranges. There may have been bad weather or fishing conditions, poor runs, or late run-timing, none of these reasons, or other reasons unknown at this point. No years had king salmon harvests above the administrative ANS range.

The high and low values are rounded to the nearest 50 salmon. The BOF typically sets minimum ANS ranges for any salmon stock at 50–100 fish in order to avoid unnecessary restriction to subsistence opportunity. Ranges with 0 as the low value are generally avoided and have not been adopted.

Option Five, with 4 suboptions, has also been provided. The department recommends BOF consideration of a single ANS range for all salmon species combined. Option Five was developed with methods similar to options one through four; e.g., using harvests from 2 different ranges of years and 2 different methods for establishing ANS ranges within each span of years. Years with reported harvests that were below the sum of the minimum administrative ANS range for each species (1,050 salmon) were not included in the calculations (1991, 1994, 1997, 2006). Again, it is unknown why reported harvests were below the ANS range.

OPTION ONE: MEANS AND STANDARD DEVIATIONS, ALL HARVESTS, 1992–2009

Option One was developed using statistical means and standard deviations and is based on reported harvests 1992–2009. Each range is based on the mean, bounded by the standard deviation (SD). For king salmon, years in which the harvest fell below the administrative ANS (750) were excluded (1997, 2009). For other salmon, 2006 was excluded because the combined harvest of 35 salmon was well below the administrative ANS range. It is unknown why harvests were low in those years.

Tyonek Option 1A:

King salmon 950–1,300
Other salmon 200-350

	Range of harvest					Mean ± SD			ANS range option	
Stock	Low	High	Mean	SD		Low	High		Low	High
King salmon	770	1,370	1,112	174	*Bounded*	938	1,285	*Equals*	950	1,300
Other salmon	156	445	256	69	*by*	187	325		200	350

Tyonek Option 1B:

King salmon 950–1,300
Sockeye salmon 50–200
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–200

	Range of harvest					Mean ± SD			ANS range option	
Stock	Low	High	Mean	SD		Low	High		Low	High
King salmon	770	1,370	1,112	174		938	1,285		950	1,300
Sockeye salmon	45	209	115	52	*Bounded*	63	167	*Equals*	50	200
Chum salmon	0	22	8	7	*by*	1	15		50	100
Pink salmon	0	32	7	9		0	17		50	100
Coho salmon	44	258	126	56		70	181		50	200

OPTION TWO: MEANS AND SD, ALL HARVESTS, 1980–2009

Option Two was developed using statistical means and standard deviations, based on reported harvests 1980–2009. Each range is bounded by the standard deviation (SD). For king salmon, years in which the harvest fell below the administrative ANS (750) were excluded (1997, 2009). For other salmon, 1991 and 2006 were excluded (combined harvest of 78 and 35 salmon).

Tyonek Option 2A:

King salmon 950–1,750
Other salmon 200-400

	Range of harvest					Mean ± SD			ANS range option	
Stock	Low	High	Mean	SD		Low	High		Low	High
King salmon	770	2,665	1,331	440	*Bounded*	891	1,772	*Equals*	950	1,750
Other salmon	156	522	292	97	*by*	195	389		200	400

Tyonek Option 2B:

King salmon 900–1,750
Sockeye salmon 50–200
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–200

	Range of harvest					Mean ± SD			ANS range option	
Stock	Low	High	Mean	SD		Low	High		Low	High
King salmon	770	2,665	1,331	440		891	1,772		950	1,750
Sockeye salmon	45	310	143	74	*Bounded*	69	216		50	200
Chum salmon	0	46	11	11	*by*	0	22	*Equals*	50	100
Pink salmon	0	50	9	12		0	20		20	100
Coho salmon	0	352	130	77		52	207		50	200

OPTION THREE: LOW AND HIGH VALUES, 1992–2009

Option Three is based upon the low and high harvest values from 1992 through 2009, rounded, to define the range. This approach is similar to that used in November 1992 to establish the administrative ANS. For king salmon, years in which the harvest fell below the administrative ANS (750) were excluded (1997, 2009). For other salmon, 2006 was excluded (combined harvest of 35 salmon).

Tyonek Option 3A:

King salmon 750–1,350
Other salmon 150–450

	Range of harvest			ANS range option (rounded)	
Stock	Low	High		Low	High
King salmon	770	1,370	*Rounded to*	750	1,350
Other salmon	156	445		150	450

Tyonek Option 3B:

King salmon 750–1,350
Sockeye salmon 50–200
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–250

	Range of harvest			ANS range option (rounded)	
Stock	Low	High		Low	High
King salmon	770	1,370		750	1,350
Sockeye salmon	45	209	*Rounded to*	50	200
Chum salmon	0	22		50	100
Pink salmon	0	32		50	100
Coho salmon	44	258		50	250

OPTION FOUR: LOW AND HIGH VALUES, 1980–2009

Option Four is based upon the low and high harvest values from 1980 through 2009, rounded, to define the range. This approach is similar to that used in November 1992 to establish the administrative ANS. For king salmon, years in which the harvest fell below the administrative ANS (750) were excluded (1997, 2009). For other salmon, 1991 and 2006 were excluded (combined harvest of 78 and 35 salmon, respectively).

Tyonek Option 4A:

King salmon 750–2,650
Other salmon 150–500

	Range of harvest			ANS range option (rounded)	
Stock	Low	High		Low	High
King salmon	770	2,665	*Rounded to*	750	2,650
Other salmon	156	522		150	500

Tyonek Option 4B:

King salmon 750–1,350
Sockeye salmon 50–300
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–350

	Range of harvest			ANS range option (rounded)	
Stock	Low	High		Low	High
King salmon	770	2,665		750	1,350
Sockeye salmon	45	310	*Rounded to*	50	300
Chum salmon	0	46		50	100
Pink salmon	0	50		50	100
Coho salmon	44	352		50	350

OPTION FIVE: SINGLE RANGE

The department recommends that the BOF consider adopting a single ANS range for all salmon species combined. Unlike options one through four, Option Five does not acknowledge any distinctive customary and traditional use patterns of king salmon in the Tyonek Subdistrict. Years in which reported harvests fell below the sum of the lower end of administrative ANS ranges for each species (1,050 salmon) were excluded from the calculation of means, SDs, and ranges in the all of the following options (1991, 1994, 1997, 2006). It is unknown why harvests were low in those years: whether it was poor fishing conditions, poor runs, neither of these reasons, or other reasons. In no year was the reported harvest of salmon above the high end of the range of the administrative ANS for all species combined (3,600 salmon).

Tyonek Option 5A: Mean and SD 1992–2009

Salmon 1,200–1,550

							ANS range option (rounded to nearest 50 salmon)	
	Low ANS	High ANS	Mean	*Bounded*	SD		Low	High
Salmon	1,209	1,538	1,373	*by*	165	*Equals*	1,200	1,550

Tyonek Option 5B: Mean and SD 1980–2009
Salmon 1,200–2,100

	Low ANS	High ANS	Mean	*Bounded*	SD		ANS range option (rounded to nearest 50 salmon) Low	High
Salmon	1,181	2,119	1,650	*by*	469	*Equals*	1,200	2,100

Tyonek Option 5C: Low and High Harvests from 1992–2009
Salmon 1,100–1,600

	Range of harvest			ANS range option (rounded to nearest 50 salmon)	
	Low	High	*Rounded to*	Low	High
Salmon	1,081 in 2009	1,609 in 2007		1,100	1,600

Tyonek Option 5D: Low and High Harvests from 1980–2009
Salmon 1,100–2,900

	Range of harvest			ANS range option (rounded to nearest 50 salmon)	
	Low	High	*Rounded to*	Low	High
Salmon	1,081 in 2009	2,917 in 1983		1,100	2,900

Table 1.–Historical subsistence salmon harvests, permit returns, Tyonek Subdistrict, 1980–2009.

	Reported salmon harvests					
Year	Chinook	Sockeye	Coho	Chum	Pink	Total
1980	1,757	235	0	0	0	1,992
1981	2,002	269	64	32	15	2,382
1982	1,590	310	113	4	14	2,031
1983	2,665	187	59	6	0	2,917
1984	2,200	266	79	23	3	2,571
1985	1,472	164	91	10	0	1,737
1986	1,676	203	223	46	50	2,198
1987	1,610	166	149	24	10	1,959
1988	1,587	91	253	12	8	1,951
1989	1,250	85	115	1	0	1,451
1990	781	66	352	12	20	1,231
1991	902	20	58	0	0	980
1992	907	75	234	19	7	1,242
1993	1,370	57	77	17	19	1,540
1994	770	85	101	22	0	978
1995	1,317	45	153	15	0	1,530
1996	1,039	68	137	7	21	1,272
1997	639	101	137	8	0	885
1998	1,027	163	64	2	1	1,257
1999	1,230	144	94	11	32	1,511
2000	1,157	63	87	0	6	1,313
2001	976	172	49	6	4	1,207
2002	1,080	209	115	4	9	1,417
2003	1,183	111	44	10	7	1,355
2004	1,345	93	130	0	0	1,568
2005	982	61	139	2	0	1,184
2006	943	20	14	1	0	978
2007	1,281	200	123	2	3	1,609
2008	1,178	121	194	9	13	1,515
2009	636	184	258	2	1	1,081
5-year average (2005–2009)	1,004	117	146	3	3	1,273
10-year average (2000–2009)	1,076	123	115	4	4	1,323
Historical average (1980–2009)	1,285	134	124	10	8	1,561

Source ADF&G Division of Subsistence Alaska Subsistence Fishing Database, 2010.

YENTNA RIVER SUBSISTENCE SALMON FISHERY

The BOF first considered proposals to provide subsistence salmon fishing opportunities in a portion of the Yentna or Skwentna rivers in 1988. Since then, several BOF actions and court decisions resulted in the regulations for the present-day subsistence salmon fish wheel fishery (5 AAC 01.593; Holen and Fall 2011). The BOF established a season limit of 2,500 salmon for the fishery; however, no ANS has been adopted.

Following are 2 options for the BOF to consider should it choose to include ANS ranges in regulation during its February–March 2011 meeting. These options were developed from harvests reported from returned permits only (Table 2). Each option includes one suboption with a range for all salmon species combined and one suboption with a range for each allowable salmon species (retention of king salmon in this fishery is not allowed).

The two options differ in two ways: 1) the range of years upon which the ANS option is based, and 2) the manner in which the high and low point of the range is established. Option One uses statistical means and standard deviations from 1996 (when the fishery was finally established) through 2010. Option Two uses the low and high reported harvests for 1996–2010. For each option, a few outlier years with unrepresentative low harvests were not included in calculations.

The high and low value for each option is rounded to the nearest 50 salmon. The BOF typically sets minimum ANS ranges for any stock at 50–100 salmon: in order to avoid unnecessary restriction to subsistence opportunity, ranges with 0 as the low value are generally avoided and have not been adopted.

OPTION ONE: MEANS AND SD, ALL HARVESTS, 1996–2010

These ranges were based on the range of harvests estimated for all years of the fishery, 1996–2010. Each range is based on the mean and is bounded by the standard deviation (SD).

Yentna Option 1A:

All salmon except king salmon 400–700 (king salmon not included in positive C&T determination)

	Range of harvest					Mean ± SD			ANS range option	
Stock	Low	High	Mean	SD		Low	High		Low	High
All salmon (except king salmon)	273	786	542	148	*Bounded by*	394	689	*Equals*	400	700

Yentna Option 1B:

Sockeye salmon 300–550
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–100
King salmon N/A (not included in positive C&T determination)

Stock	Range of harvest Low	High	Mean	SD		Mean ± SD Low	High		ANS range option Low	High
Sockeye salmon	177	675	422	139	*Bounded by*	283	560	*Equals*	300	550
Chum salmon	3	51	16	13		3	29		50	100
Pink salmon	0	115	25	28		0	53		50	100
Coho salmon	14	175	79	45		34	124		50	100
King salmon	N/A (not included in positive C&T determination)									

OPTION TWO: LOW AND HIGH VALUES, 1996–2010

These ranges were based on the range of harvests reported in the fishery, 1992–2010. According to standard practice for developing initial ANS ranges, this does not include the two lowest years (2005, 2009, which are virtually the same) or highest year (2010) because it is unknown why the harvests in the two lowest years were low, nor is it known why the harvest in the highest year is that high. In none of these outlier years, however, has the harvest approached the 2,500 fish limit.

Yentna Option 2A:

All salmon 400–650
except king salmon (king salmon not included in positive C&T determination)

Stock	Range of harvest Low	High		ANS range option (rounded) Low	High
All salmon (except king salmon)	397	672	*Rounded to*	400	650

Yentna Option 2B:

Sockeye salmon 250–550
Chum salmon 50–100
Pink salmon 50–100
Coho salmon 50–100
King salmon N/A (king salmon not included in positive C&T determination)

	Range of harvest			ANS range option (rounded)	
Stock	Low	High		Low	High
Sockeye salmon	242	553	*Rounded to*	250	550
Chum salmon	4	51		50	100
Pink salmon	2	115		50	100
Coho salmon	46	175		50	100
King salmon	N/A (not included in positive C&T determination)				

Table 2.–Historical subsistence and personal use salmon harvests, Upper Yentna River, permit returns, 1996–2010.

	Estimated salmon harvest					
Year	King [b]	Sockeye	Coho	Chum	Pink	Total
1996 [a]	0	242	46	51	115	454
1997 [a]	0	549	83	10	30	672
1998	0	495	113	15	30	653
1999	0	516	48	13	18	595
2000	0	379	92	7	4	482
2001	0	545	50	4	10	608
2002	0	454	133	31	14	632
2003	0	553	67	8	2	630
2004	0	441	146	3	36	625
2005	0	177	42	25	24	268
2006	0	368	175	26	14	583
2007	0	367	66	18	17	468
2008	0	310	57	7	23	397
2009	0	253	14	6	0	273
2010	0	675	52	18	41	786
5-year average (2006–2010)	0	395	73	15	19	501
10-year average (2001–2010)	0	414	80	15	18	527
Historical average (1996–2010)	0	422	79	16	25	542

a Classified as personal use fishery in 1996 and 1997, and as a subsistence fishery in other years.

b No king salmon may be retained in this fishery.

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 1995. Report on implementation of the 1992 subsistence law Alaska Department of Fish and Game Division of Subsistence, Special Publication No. SP1995-001, Juneau.

Fall, J. A. 1989. The subsistence king salmon fishery at Tyonek, Alaska: A case study of Alaska's subsistence law. Anchorage.

Fall, J. A., D. J. Foster, and R. T. Stanek. 1984. The use of fish and wildlife resources in Tyonek, Alaska: *Tubughna Ch'adach' Elnen Ghuhdilt'a.* Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 105, Anchorage.

Foster, D. J. 1982. The utilization of king salmon and the annual round of resource uses in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 27, Anchorage.

Holen, D., and J. A. Fall. 2011. Overview of subsistence salmon fisheries in the Tyonek Subdistrict and Yentna River, Cook Inlet, Alaska. Alaska Department of Fish and Game Division of Subsistence Special Publication No. BOF 2011-01, Anchorage.

Stanek, R. T., D. L. Holen, and C. Wassillie. 2007. Harvests and uses of wild resources in Tyonek and Beluga, Alaska, 2005–2006. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 321, Juneau.

Tyonek Fish & Game Advisory Committee Meeting Minutes of February 7, 2011 RC 21

Members Present: Al Goozmer, John Standifer, Larry Heilman, Chad Chickalusion, Donald Standifer, Jr, Randy Standifer

Attn: Scott p 2
AC Comments BOG
SC

Members Absent Unexcused: Aaron Jones

RECEIVED
FEB 17 2011
BOARDS
ANCHORAGE

Members Absent Excused: Christy Moon, Brandy Standifer

FILED
2-17-11

Upper Cook Inlet BOF proposal comments

There is a need more information about the UCI hooligan smelt fishery. Concern of it becoming like the North Pacific cod fishery and wondering where the sea lions are going. The same thing occurs here, they feed the eagles, the beluga, the people, etc with increased harvest since 1978.

On the salmon – there is no equity in the distribution of salmon in the Upper Cook Inlet. King salmon caught in Tyonek, with no harvest on the other side of the Chuitt River is believed that the king salmon were headed up the Chuitt River. But also the Central District commercial fleet is believed to be harvesting a large portion of those fish. Greed is governed by the golden rule (he who has the gold, rules) in the Central District.

Tyonek gets left hanging due to costs of getting the fish out, so they have had to resort to flying the fish out – and the number of fish harvested has continued to decline due to a lack of fish. The quality of the fish delivered in Tyonek are top quality – they are immediately iced, but the opportunity is just not there. The 41,000 harvested used to be one boat catch in one season. Used to be a lot more limited entry permits in the Northern District than there is today. If left up to Tyonek, they would split the Central District right down the middle to Kalgin Island. Those fish headed for Susitna / Deshka River are going outside the Tyonek District boundaries. This affects not only the Tyonek commercial fishing, but also the Upper Cook Inlet sport fishery, who are trying to harvest fish for their freezer and feed their families.

AK State Trooper took one of the members fishing net – he had only caught one king salmon and he took his net (this occurred last spring). He was told his net was too close to the Chuitt River.

There was one proposal by ADF&G to open up Central District for an escapement corridor, but it was too ambiguous, so was opposed. However, they do support a corridor and put in a proposal to address that.

A good example was during the Exxon Valdez oil spill, the Central District drift fleet was closed, and the Tyonek fishing was excellent during that time. The continual loss of power, due to lack of economic benefit in the upper district, only confounds the problem. More people are getting rid of their permits and again, this contributes to the overall decline.

Even though there have been studies done on the DNA, finding even Kodiak was intercepting fish, nothing seems to be done to address the problems. If you look at a map, you can see that the natal streams of the fish are primarily in the Northern District.

196 – Sr citizen quarter mile above the bridge July 10 - Aug 31 on the Beluga River.
6-0 Support

Unit 16 Game proposal comments

We don't accept the bear survey statistics because there are conflicting numbers there from the guides (Tyonek Native Corporation) and the numbers the department provided. The official predator control on black bear number is much lower than what was reported to the chair.

The wolf count report that was received was OK.

The moose count survey is also not agreed upon because they only did the southern district, did not specify what grid was used, or what tactical analysis data did they use to come up with those numbers. They believe that the numbers are inflated and that it is politically motivated. Planes are coming over and moving moose away from local hunters. Enforcement is very lacking. Supercubs were like an invasion last fall.

AC opposed all the proposals pertaining to Unit 16. If they want to open up Unit 16, they better have the enforcement to support it.

Meeting adjourned in order to go to the school and talk to the students about the AC and the Board process.

There were eleven students who will form a "mini" Fish & Game Advisory Committee. The students elected Jean Leigh Shanigan as Student Chair; Ryan Baker as Student Vice Chair; and Randall Jones as Student Secretary.

RC22

Tyonek Fish and Game Advisory Committee
2010 election meeting
January 18, 2011
Tribal building, Tyonek, Alaska

Attn: Scott
BOG- Reg 4
AC Comment

FILED
2-9-11

Chairman Al called the meeting to order at 11:15 am
In attendance:
John Standifer, Al Goozmer, Jessica Standifer, Betty Valka, Aaron Jones, Donald Standifer Jr. Larry Heilman, Brandy Standifer, Lindsay Bismark

Chairman Al *opened the floor for discussion on the* ***moose survey.***
All agreed that there are more moose in our area but the estimated number submitted ADF&G seem to be much higher that what noted by individuals and pilots.
What formula was used?
Why was not the middle and upper area surveyed?
What area in the Southern district was flown?

Predator control The number of bears killed reported by the Dept. seems to be lower count than what was reported to us. By other guides

Hooligan catch. The report indicates a sporadic catch; with the highest catch of 160K tons.
Where is the catch going?
Who is buying?
What are the prices?
More discussion on the matter.

BOF →

Chair Al will report at or before the next meeting.

Elections:
Lindsay nominated John, seconded my Larry
Motion to close
Closed my unanimous consent.
John was reelected
Lindsay nominated Aaron, seconded by Randy
Motion to close
Closed by unanimous consent
Aaron was reelected
Lindsay nominated Betty
Betty nominated Jessica
Vote between Betty and Jessica
By a vote of 6-3 Jessica was elected as a new member

RECEIVED
FEB 08 2011
BOARDS
ANCHORAGE

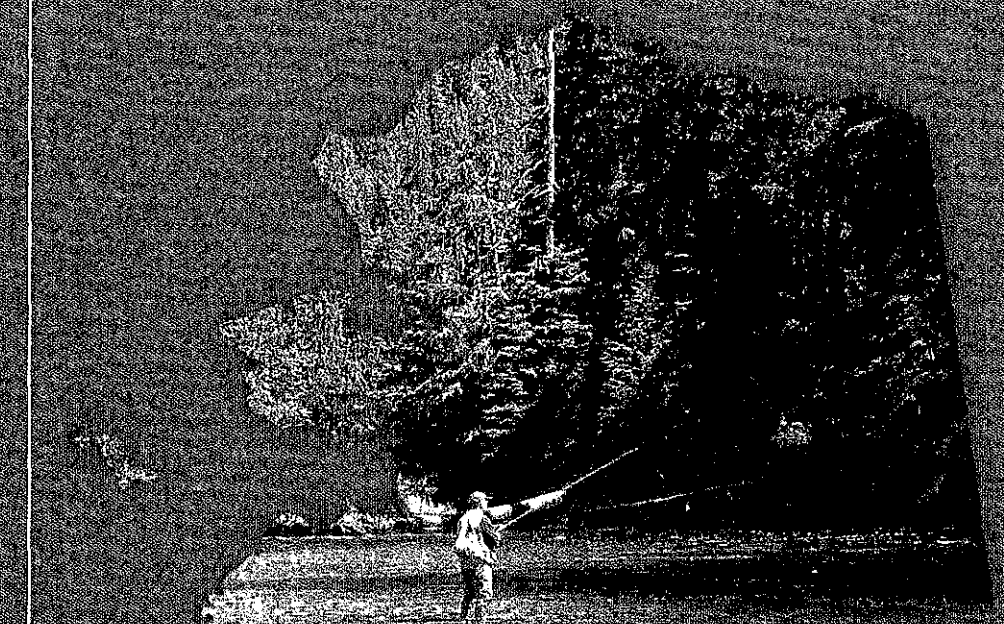
Officers vote:
Chairman, Lindsay nominated Al, John was nominated, declined
Al was voted Chair

Vice Chairman Lindsay nominated John, second by Brandy
John was selected as Vice Chair

Secretary, Don nominated Jessica, second by Randy
Jessica was selected as secretary of the committee.

No further business before the committee.
Adjourned 1:50

RC 23



ECONOMIC IMPACTS AND CONTRIBUTIONS OF SPORTFISHING IN ALASKA

2007 REPORT

A Message from the Director

CHARLIE SWANTON, DIRECTOR
ADF&G, DIVISION OF SPORT FISH

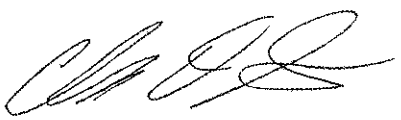
Alaska supports arguably some of the finest and most diverse sportfishing in the world. These opportunities provide Alaskans with a significant and sustainable source of food, relaxation, and social benefits. Additionally, the money spent by residents and visitors who participate in sportfishing activities produces significant economic benefits to Alaska.

The Division of Sport Fish is committed to providing an array of biological, social and economic information to fishery managers and fishery regulators who plan and evaluate fishery projects and make informed decisions about the management of fishery resources.

This report summarizes a recent effort by the Division to provide estimates of angler spending in Alaska and the contribution it makes to Alaska's economy. The results are based on an extensive statewide study of resident and nonresident anglers who went sportfishing in Alaska during 2007. The report contains estimates of the total expenditures on sportfishing by anglers and estimates of the subsequent economic effects this spending had in terms of employment, wages, salaries and tax receipts.

A key objective of this project was to establish a consistent and repeatable methodology for collecting and reporting estimates of economic contribution in Alaska such that reasonably precise estimates would be routinely available to agency personnel, fisheries decision-makers, and the public.

We hope that you find the following information useful and that it contributes to well-informed decision making.



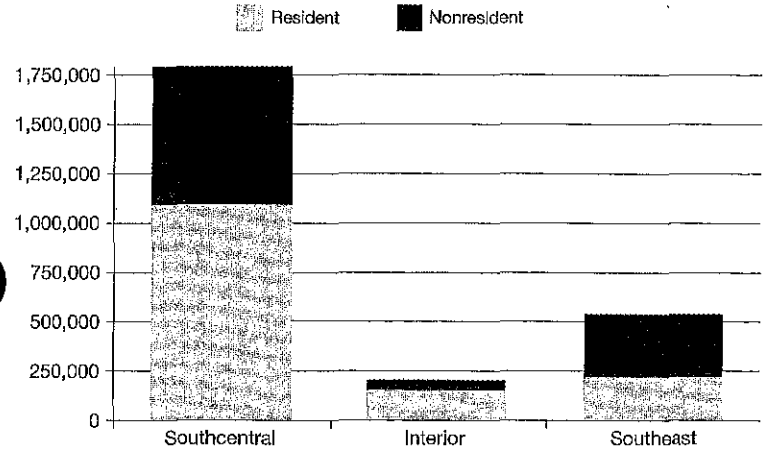
Sportfishing in ALASKA

Sportfishing is an important component of the Alaskan economy. It contributes to the well-being of Alaskans as recreation, as a source of food, and as part of the state's collective economic fabric. In 2007, 190,644 Alaska residents bought a fishing license, along with 284,890 nonresidents.

Spending a day fishing with rod and reel usually involves spending at least some money for travel, equipment, and supplies. Because a large number of anglers—both resident and nonresident—spend many days each year enjoying Alaska's diverse fishing opportunities, the annual total of that spending is substantial.

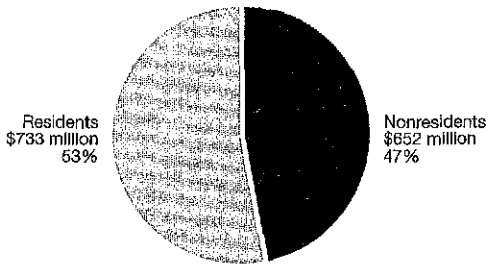
The money spent by anglers in turn helps to support thousands of Alaskan jobs in industries ranging from fishing tackle sales to hospitality and lodging to air taxi and guide services which are an important part of the economy in many of Alaska's local communities. At the same time, angler spending is also creating federal, state and local tax revenues which support local and borough governments and help pay for fisheries management in Alaska.

DAYS OF SPORTFISHING IN ALASKA BY REGIONS AND RESIDENCY, 2007

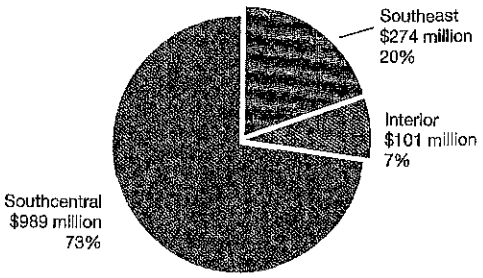


TOTAL SPORTFISHING EXPENDITURES, All ANGLERS

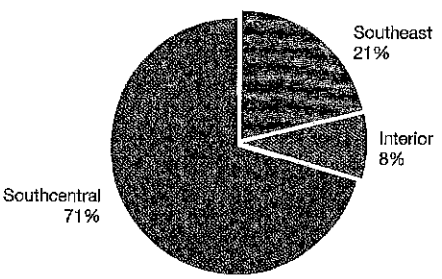
$1.4 billion



SPORTFISHING EXPENDITURES BY REGION, ALL ANGLERS



DAYS OF SPORTFISHING BY REGION, ALL ANGLERS



Economic IMPACTS & Contributions

Economic Impact vs. Economic Contribution

This project measured and reported the economic impacts and contributions of licensed anglers to Alaska's state and regional economies. The words "impact" and "contribution" are not necessarily synonymous.

Economic impact typically refers to the effects of money being brought in from outside the state or region. It was possible to estimate the total amount of resident and nonresident spending in Alaska as a whole and within specific regions by combining the economic survey results with the ADF&G Statewide Harvest Survey results.

Economic contribution refers to in-state spending by all anglers. In theory, if the dollars spent by resident anglers were not spent on sportfishing, the same money would be spent on other things and would still stimulate economic activity. It isn't possible to accurately predict whether these local dollars would be spent in or outside of Alaska.

This study generated both economic impact estimates (nonresident spending) as well as estimates of the economic contributions of spending by Alaska anglers in 2007.

The purpose of the study was to obtain current estimates of the economic contribution of sportfishing activities to the Alaska economy and to develop a consistent method for producing such estimates on a regular basis. This project provides a survey-based process that can now be updated periodically at reasonable cost.

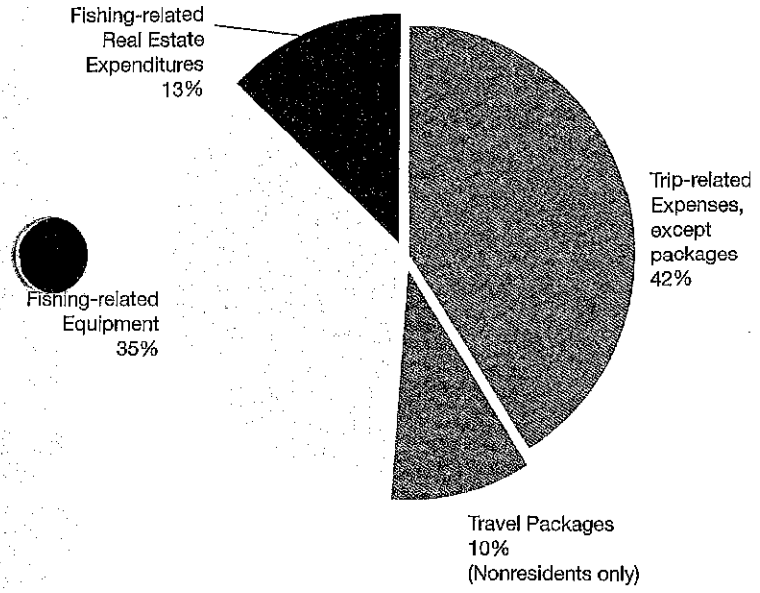
For 2007, the year covered by this report, 1,163 resident and 1,807 nonresident surveys were completed by anglers who fished in Alaska. From the survey responses collected, estimates of how much each angler spends per day of fishing and per year on fishing-related equipment were produced. These survey results were combined with the total number of licensed anglers in 2007 and the total days of fishing in Alaska as estimated by the Division's Statewide Harvest Survey. This survey, conducted every year by the Division, tracks annual sportfishing participation and harvest. By combining the economic survey results with the Statewide Harvest Survey results, it was possible to estimate the total amount of resident and nonresident spending in Alaska as a whole and within specific regions of the state.

An economic model was then used to estimate the additional economic effects that angler spending produced within each region of the state. Using the collective dollars spent by anglers, an economic model known as IMPLAN estimated the total jobs, tax revenues and other economic contributions. Regional as well as statewide totals can be determined and are summarized in the following pages. Information on the dollars associated with guided fishing trips and with nonresident fishing is also included. First, here are some statewide highlights.

Total Resident and Nonresident Sportfishing Expenditures, by Category

	Resident Anglers	Nonresident Anglers	All Anglers
Licenses and Fees	$6,627,558	$16,536,955	$23,164,513
Trip Expenditures (non-package)	$219,829,151	$347,358,999	$567,188,150
Package Expenditures	n/a	$137,519,700	$137,519,700
Equipment Expenditures	$433,693,104	$41,985,450	$475,678,554
Real Estate Expenditures	$73,139,537	$109,097,619	$182,837,156
Total Expenditures	**$733,289,349**	**$652,498,723**	**$1,385,788,072**

TOTAL ANGLER SPENDING BY CATEGORY



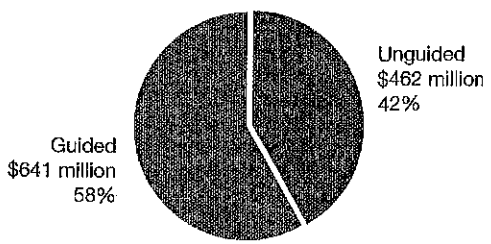
Average Per Day Expenditure for Trip-Related Items Only, Including Package Trips

(Lodging, fuel, food, travel packages, etc.)

	Per Day
All Alaska Fishing Combined	**$277.46**
Residents Only	$150.63
Non-Residents Only	$448.78
Saltwater	
Residents, Unguided	$162.81
Residents, Guided	$466.53
Non-Residents, Unguided	$209.40
Non-Residents, Guided	$744.03
Freshwater	
Residents, Unguided	$91.73
Residents, Guided	$509.56
Non-Residents, Unguided	$213.24
Non-Residents, Guided	$790.41

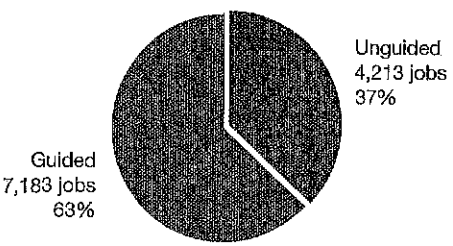
ECONOMIC ACTIVITY, OR MULTIPLIER EFFECT: SUPPORTED BY GUIDED AND UNGUIDED FISHING TRIPS

Trip-related and Package Expenditures*

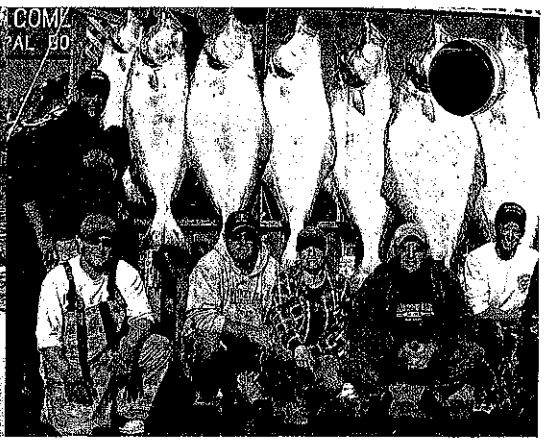


JOBS: SUPPORTED BY GUIDED AND UNGUIDED FISHING TRIPS

Trip-related and Package Expenditures*



*Only trip related expenditures (food, fuel, lodging, etc.) could be divided into guided and unguided portions. It was not possible to divide equipment expenditures in such a manner.



How Economic Effects Occur

While the economic effects of sportfishing occur on a large scale statewide, it's important to note that they happen one angler at a time.

Suppose, for example, that a construction worker in downtown Anchorage decides to go fishing on his day off. He stops after work at the local tackle shop and spends $250 for a rod and reel along with some line, lures, a knife and cooler. Sandwiches, soda, and ice for the trip come from the local grocery store, and he spends still more money to fill his vehicle with gas on the way home. Very early the next morning, he starts the 150-mile drive out the Seward and Sterling highways to the Kenai River where he'll fish for king or coho salmon.

Meanwhile, the money he left behind goes to work. Some of the money he spent for fishing gear helps to pay the wages of a sales clerk, for example, who in turn spends some that evening at a local restaurant, to buy groceries, or pays his utility bill at the local light and power company. These payments, known collectively as the "multiplier effect", help to support still other jobs as the money our angler spent ripples outward in many directions through the local economy, even to those sectors not directly related to fishing. See page 11 for more definitions.

Regional Economic EFFECTS

Economic effects can be measured regionally and locally as well as statewide. Alaska has several distinct regions, each with its own characteristic sport fisheries that show different patterns in angling participation, spending and economic effects.

STATEWIDE RESULTS

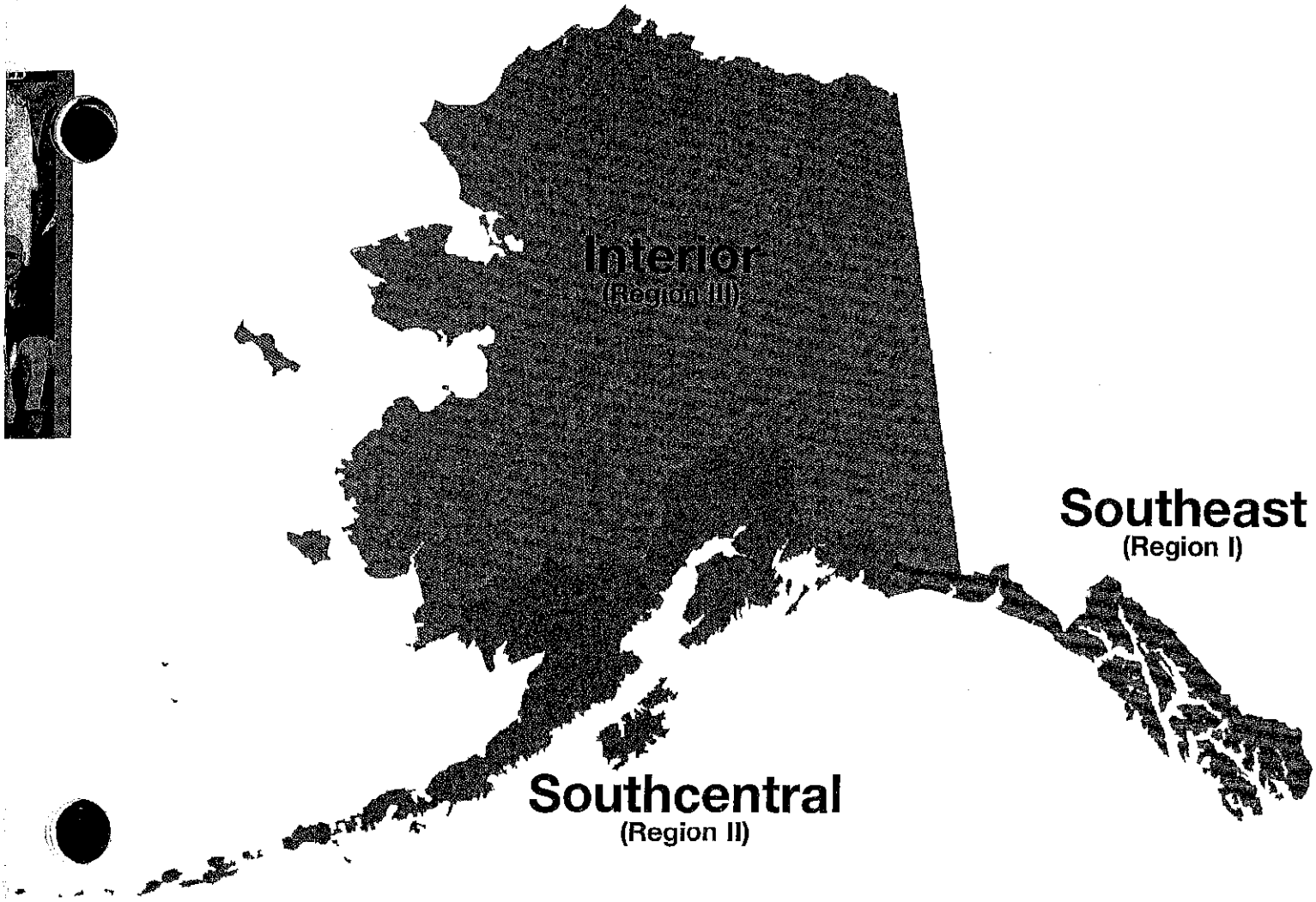
Alaska is blessed with many world-class freshwater and marine fisheries. In 2007, resident and nonresident anglers spent nearly $1.4 billion on equipment, boats, and trip-related and other items. Alaska anglers on average spent $2,914 on sportfishing trip expenses, fishing-related equipment, licenses, and other items in 2007. The actual amount spent per angler varies based on his or her preferred fishing locations, region, and more. Details are available in the technical report (see sidebar on page 8).

As anglers' expenditures exchange hands, economic contributions are generated statewide. In 2007, these contributions amounted to 15,879 jobs, $246 million in tax revenues and $545 million in income. Economic output, which is the value of all goods and services produced by businesses as a result of anglers' expenditures, was just over $1.6 billion.

SOUTHEAST (REGION I)

The so-called Panhandle area extending roughly from Yakutat south-southwest through Juneau and Ketchikan to the British Columbia border is a complex maze of islands, straits, and mountains. The saltwater salmon fishing here is outstanding, although some anglers find steelhead, along with river-resident trout, to be just as appealing.

Total spending by all anglers, resident and nonresident combined, for Southeast Alaska in 2007 was estimated to be $274 million. The total economic output came to $295 million, which supported 3,063 jobs and generated $22 million in state and local taxes.



SOUTHEAST MARINE (SUBREGION)

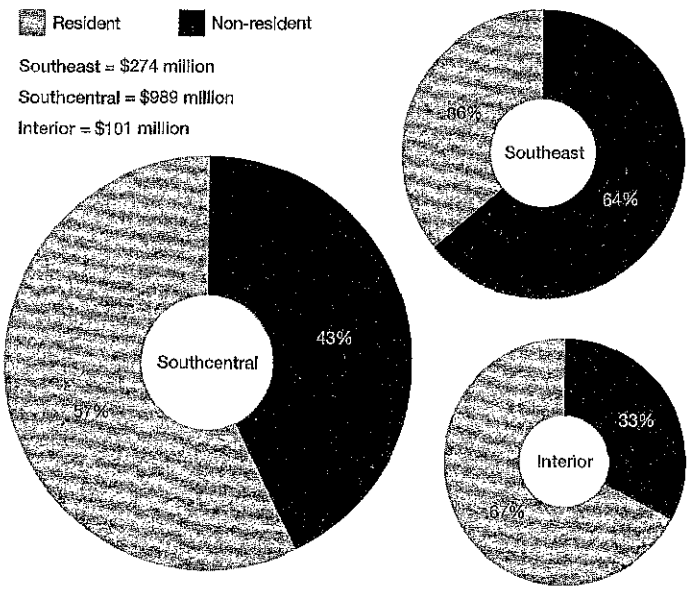
Within southeast Alaska, the popularity of salt-water fishing accounted for almost half of all angler spending. Saltwater anglers in southeast Alaska spent $132 million of the $274 million spent on sportfishing in southeast Alaska in 2007, which supported 1,897 jobs and created $14 million in state and local tax revenues.

SOUTHCENTRAL (REGION II)

This is by far the most popular angling region in Alaska as measured in total angler days. It includes Prince William Sound, Cook Inlet and the Anchorage area, as well as Kodiak Island and the Bristol Bay area to the west of Cook Inlet. All five salmon species are fished widely here in both salt- and fresh-water, along with halibut and other saltwater species. Trophy rainbow trout in the various Bristol Bay drainages are world-famous.

Anglers spent $989 million in the Southcentral region in 2007, supporting 11,535 area jobs and creating $91 million in state and local taxes.

RESIDENT AND NONRESIDENT EXPENDITURES BY REGION



Economic measures reported in this chart are based on regional IMPLAN model outputs using 2007 angler expenditures.

For More Details...

This report is a summary of a 300 page technical report available free from the Alaska Department of Fish and Game, Division of Sport Fish. The complete report presents detailed descriptions of the methods and data sources used in the study, as well as the complete results. Visit ***www.sf.adfg.state.ak.us/statewide/economics*** *to download a copy in PDF form. You may also contact the Department at (907) 267-2366, or william.romberg@alaska.gov, to request a printed copy of the report.*

Regional Economic EFFECTS *(cont.)*

COOK INLET (SUBREGION)

Notably, much of Southcentral's economic activity centers around the Cook Inlet area, partly because Anchorage and the Matanuska-Susitna valley are such large population centers with good fishing nearby. The Kenai River, for example, is an easy drive from Anchorage and is widely known among anglers as one of the world's foremost salmon rivers. In addition, there are large sport fisheries for halibut and other groundfish that are accessed from several communities that border Cook Inlet. In the Cook Inlet subregion alone (a subset of Southcentral region), anglers spent about $733 million in 2007, which supported 8,056 jobs and generated $55 million in state and local taxes.

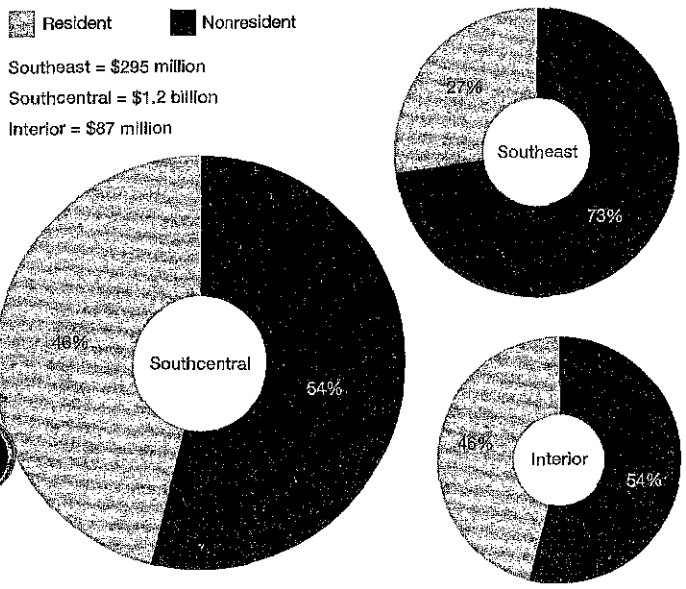
INTERIOR (REGION III)

Among anglers, the northern two-thirds of the state could be called the road less traveled. This vast area contains many small communities and sport fisheries located off the road system with fisheries less accessible than places farther south in the state. However, the fishing is none the less exceptional, and in addition to salmon and trout there are fisheries for unique species such as sheefish, arctic char, and burbot, as well as huge northern pike found in the "flats" region of the lower Yukon River.

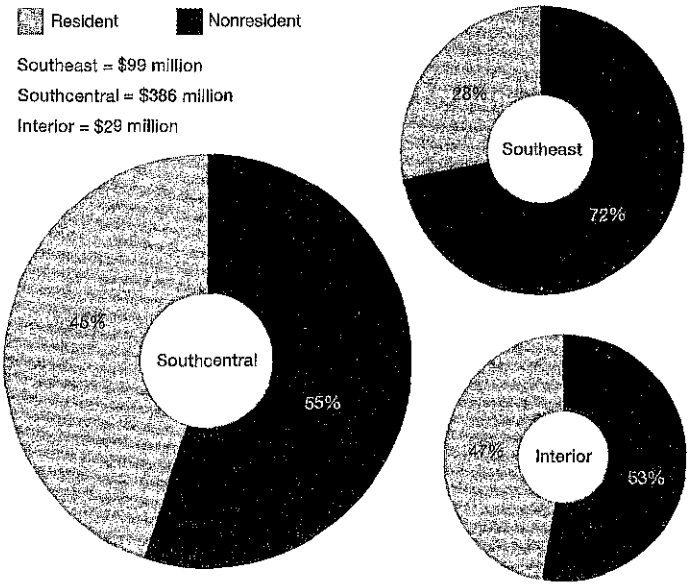
Angling traffic here is lighter than in other regions of the state but still significant. Total regional spending by all anglers in this region topped $101 million in 2007 and directly or indirectly supported 923 area jobs and $7 million in state and local taxes.

Total Angler Expenditures
$1.4 Billion

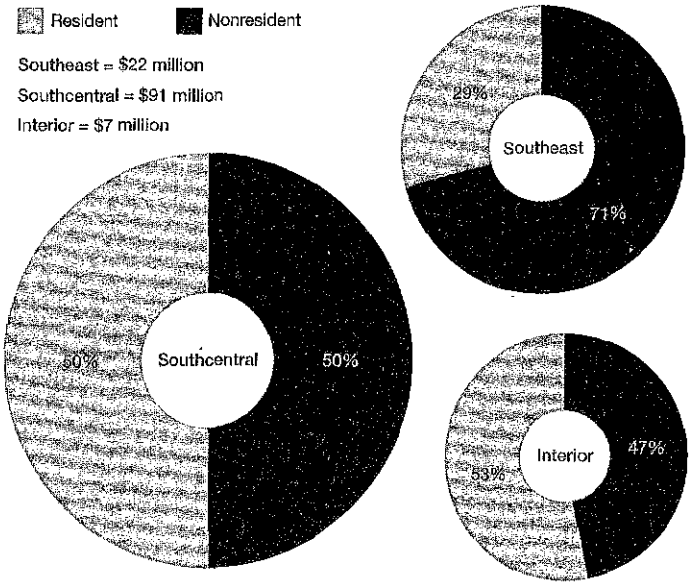
RESIDENT AND NONRESIDENT OUTPUT BY REGION



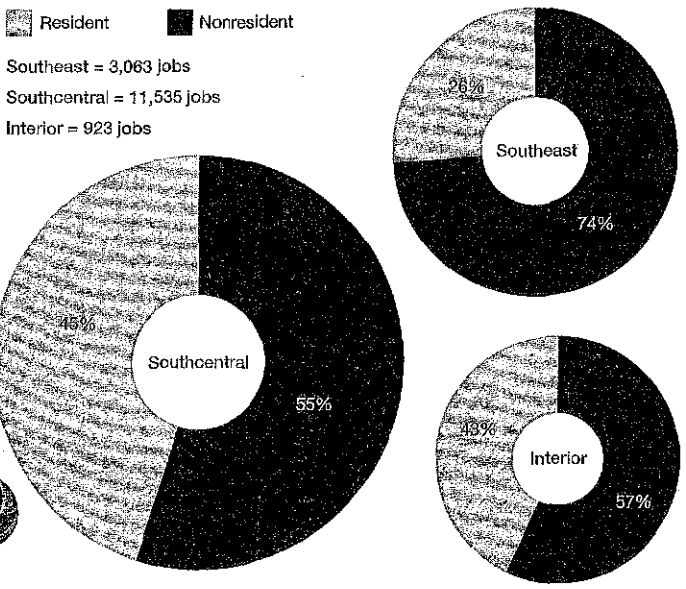
RESIDENT AND NONRESIDENT INCOME BY REGION



RESIDENT AND NONRESIDENT STATE & LOCAL TAX REVENUES BY REGION



RESIDENT AND NONRESIDENT EMPLOYMENT BY REGION



Sportfishing-related Jobs
15,879

Economic measures reported in these charts are based on regional IMPLAN model outputs using 2007 angler expenditures.

See page 11 for definitions of terms used on this page.

Economic Contributions of Sportfishing in Alaska, by Residency & Region, 2007

	Resident Anglers	Nonresident Anglers	All Anglers
ALASKA - STATEWIDE RESULTS			
Anglers' expenditures	$733,289,349	$652,498,723	$1,385,788,072
Output	$668,729,829	$938,863,856	$1,607,593,685
Income	$223,373,937	$321,882,151	$545,256,088
Jobs	6,442	9,437	15,879
Tax Revenues	$107,433,536	$138,881,701	$246,315,114
Local & State	*$56,509,573*	*$66,632,831*	*$123,142,404*
Federal	*$50,923,959*	*$72,248,870*	*$123,172,709*
SOUTHEAST REGION			
Anglers' expenditures	$98,613,993	$174,890,811	$273,504,804
Output	$79,385,025	$215,874,985	$295,260,010
Income	$27,316,008	$71,825,686	$99,141,694
Jobs	791	2,273	3,063
Tax Revenues	$12,227,368	$31,368,564	$43,595,932
Local & State	*$6,376,236*	*$15,686,783*	*$22,063,019*
Federal	*$5,851,182*	*$15,681,782*	*$21,532,916*
SOUTHCENTRAL REGION			
Anglers' expenditures	$560,955,071	$427,603,048	$988,558,119
Output	$534,838,006	$630,707,507	$1,165,545,513
Income	$174,829,996	$211,633,737	$386,463,733
Jobs	5,170	6,365	11,535
Tax Revenues	$86,563,199	$93,692,068	$180,255,267
Local & State	*$45,612,530*	*$45,187,101*	*$90,799,631*
Federal	*$40,950,668*	*$48,504,967*	*$89,455,636*
INTERIOR REGION			
Anglers' expenditures	$67,092,727	$33,467,910	$100,560,637
Output	$40,133,830	$46,578,879	$86,712,709
Income	$13,263,706	$15,300,176	$28,563,882
Jobs	399	524	923
Tax Revenues	$6,710,270	$6,708,875	$13,419,146
Local & State	*$3,825,310*	*$3,396,831*	*$7,222,141*
Federal	*$2,884,961*	*$3,312,044*	*$6,197,005*

Output = total economic activity generated by angler spending
Income = salaries, wages, employee benefits and proprietors' profits stimulated by anglers
Jobs = same as employment, these are the total number of both full-time and part-time jobs supported by angler spending
Tax Revenues = the total personal and business tax revenues earned by local, state, and federal government that are generated by angler spending

Economic Contributions of Sportfishing for Specific Subregions, 2007

	Resident Anglers	Nonresident Anglers	All Anglers
COOK INLET (A SUBREGION OF THE SOUTHCENTRAL REGION)			
Anglers' expenditures	$457,938,464	$275,030,511	$732,968,975
Output	$413,287,612	$414,602,226	$827,889,838
Income	$136,650,136	$142,124,416	$278,774,552
Employment	4,010	4,046	8,056
Tax Revenues	$67,097,024	$44,145,496	$111,542,520
Local & State	*$35,189,444*	*$20,091,926*	*$55,281,369*
Federal	*$31,907,580*	*$24,353,570*	*$56,261,150*
SOUTHEAST REGION - MARINE FISHING ONLY†			
Anglers' expenditures	$21,268,271	$110,345,177	$131,613,448
Output	$28,244,412	$138,794,141	$167,038,552
Income	$9,132,220	$44,692,671	$53,824,891
Employment	301	1,595	1,897
Tax Revenues	$4,791,024	$21,577,534	$26,368,559
Local & State	*$2,713,584*	*$11,473,357*	*$14,186,941*
Federal	*$2,077,440*	*$10,104,178*	*$12,181,618*

Output = total economic activity generated by angler spending
Income = salaries, wages, employee benefits and proprietors' profits stimulated by anglers
Jobs = same as employment, these are the total number of both full-time and part-time jobs supported by angler spending
Tax Revenues = the total personal and business tax revenues earned by local, state, and federal government that are generated by angler spending
†The contributions are for trip spending only, including travel packages. It was not possible to allocate equipment and real estate expenditures by type of water fished.

Definitions of Terms Used in this Report

Angler Expenditures: the dollars spent for the primary reason of sportfishing. Such expenditures include trip-related expenses for fishing (fuel, guide services, lodging, etc.), fishing tackle and other fishing equipment, the portion of ancillary equipment used for fishing that may have multiple uses (e.g., coolers, binoculars), and real estate maintenance and construction expenditures if used primarily for the pursuit of sportfishing.

Total Multiplier Effect (also known as Total Economic Activity): the results (measured in output, income, jobs and taxes) of the total rounds of business and consumer spending stimulated by anglers' original expenditures.

Income: generated as a result of anglers' expenditures, this includes total payroll, including salaries and wages, as well as benefits such as insurance, and retirement benefits paid to employees and business proprietors.

Employment: the total number of both full-time and part-time jobs supported as a result of anglers' expenditures.

Tax Revenues: the total tax revenues earned by local, state and federal governments as a result of anglers' expenditures. All forms of local, state and federal taxes are included.

ACKNOWLEDGEMENTS

Funding for this study was provided by the Alaska Legislature which approved a $229,800 Fish and Game Fund increment and a $200,000 General Fund increment to the Division of Sport Fish FY 2008 budget. The Division of Sport Fish would like to thank Southwick Associates for their dedicated work on this project as well as the many anglers and guide businesses who participated in this study by providing detailed information on their sportfishing-related expenditures in 2007.

Southwick Associates, based in Fernandina Beach, FL, was founded in 1989 to serve state fish and wildlife agencies and the sportfishing and hunting industries. From our north Florida offices, we continue to serve this core group, and now provide economic and business intelligence to many more.

SOUTHWICK ASSOCIATES
FISH AND WILDLIFE ECONOMICS AND STATISTICS

Citation: Economic Impacts and Contributions of Sportfishing in Alaska, Summary Report 2007. Alaska Department of Fish and Game, Division of Sport Fish. January, 2009. Anchorage, Alaska.

For more information, contact: Bill Romberg
Alaska Department of Fish and Game, (907) 267-2366 or william.romberg@alaska.gov

Design and layout by Sweetpea Media, Inc. • Fernandina Beach, FL