

Kenai River Recreation Impact Monitoring Project 2002

Summary

Lower Kenai River Boaters

June – July, 2002



By Chris Degernes
Division of Parks and Outdoor Recreation
Department of Natural Resources

January 2003

INTRODUCTION

The Kenai River Special Management Area (KRSMA) was legislatively established in 1984, with management authority granted to the Department of Natural Resources. The purposes for which the KRSMA was established include:

- To protect and perpetuate the fishery and wildlife resources and habitat in the unit and adjacent area.
- To manage recreational uses and development activities in the unit and adjacent area

Over the years, much discussion has related to recreational use and conflicts between the various user groups. In 1992, the Division of Parks and Outdoor Recreation (DPOR) conducted an extensive Carrying Capacity Study¹ that surveyed boaters, bank anglers and non-fishing recreational users, land owners and guides. Besides providing a baseline for recreational use and attitudes among the user groups, the study provided a number of options for management changes. The KRSMA Advisory Board made a number of recommendations for management changes as a result of that effort.

In 1996-1997, during the public process to revise the 1986 Kenai River Comprehensive Management Plan, numerous comments were made by the public regarding continuing conflict on the river between different user groups. Most often mentioned was the conflict between guided and non-guided activities. Among the recommendations from that planning effort was a recommendation to update the 1992 Carrying Capacity Study and another to prepare "Vessel Overcrowding Study."² It was intended that studies be designed to distinguish between different user groups and their contributions toward perceived recreation conflict.

Funding totaling 120.0 was provided through the Department of Fish and Game for two Kenai River studies in 1998: a boat wake study and a vessel crowding study. The boat wake study was completed in 2000, and a recreation use study was being designed in 2000-2001 when the funding was lost through a Legislative reappropriation.

During early fall 2001, the Kenai River Special Management Area Advisory Board evaluated whether to pursue additional capital funding or pursue other options for accomplishing a recreation use study. With capital funding not likely to be readily available, the Board recommended scaling a project down to a size that could be accomplished using volunteers, and then proceeded to design the project that was implemented in June and July 2002. It is anticipated that a smaller scale project can be repeated easily on an annual basis, with various sections of the river monitored. As a result, all sections of the river might be more routinely monitored for changes.

For the 2002 season, efforts were focused on the Lower Kenai River during June and July 2002. The monitoring project purpose was to address recreation use dynamics and activity on the river as well as survey boaters about the experience and perceptions

¹ Kenai River Carrying Capacity Study, Final Report, Oct. 1993

² Kenai River Comprehensive Management Plan, adopted Dec. 1997

they had while on the river. The area of focus was downstream from the Soldotna Bridge, while the focus group included all boaters, both power and drift. Three tools were used: on site (exit) surveys, GPS boat monitoring, and video monitoring. Assistance was provided by two DPOR Volunteers, with expertise and guidance provided by Dr. Greg Brown, Alaska Pacific University.

PROJECT OBJECTIVES

- Document dynamics of river use by private, rental boat, and guided powerboat and drift boat users on the Kenai River between Soldotna and the Warren Ames Bridge.
- Survey boaters at river exit points to query them about their river experience and attitudes toward management alternatives.
- Document differences in use, behavior, and impacts, if any, between different user groups utilizing the Kenai River, and compare this data with similar data collected in 1992.
- **Schedule:** June – July, 2002
- **Project location:** Soldotna Bridge to Warren Ames Bridge
- **Targeted User Groups:** Private, guided and rental boat operators using either power or drift boats

PROJECT COMPONENTS

On-Site Survey – Short written surveys were taken at certain locations and times at various exit locations on the lower Kenai River.

The survey was patterned after the 1992 Kenai River Carrying Capacity Study survey for powerboat anglers. Many of the questions from the 1992 survey were retained but some additional questions were suggested by the KRSMA Advisory Board and included for the 2002 survey. As a result, survey data from 2002 can be compared to comparable 1992 questions in order to evaluate changing trends in recreation use, impacts or acceptance of management alternatives.

Methods and Procedures -

Parks Volunteer Eve Dreyer administered the survey (Appendix A) at Centennial Campground and the Pillars. Survey times were scheduled to insure that both private and guided boaters were surveyed. A survey schedule can be found in Appendix B.

Boaters were contacted at the completion of their trip, with one person asked to complete the survey for each group. 155 surveys were collected during 19 different days of sampling. Only 20 of the surveys were collected during June, as the entire

Kenai River was closed by Alaska Department of Fish and Game Emergency Order to fishing for king salmon on June 11, effectively shutting down most fishing on the river until July 1. And, when the river opened to king salmon fishing again on July 1, only the section of river downstream from the Soldotna Bridge was opened until July 14. This resulted in most of the fishing via boats to occur within the project area for the first two weeks in July.

The data from completed surveys was input into an SPSS data base, and subsequently analyzed by Dr. Greg Brown, Associate Professor, Environmental Science Department, Alaska Pacific University. The survey information from lower River drift and powerboat anglers taken in June and July 1992 was compared to the 2002 survey data for those questions that were the same. The following pages contain the comparison of the two surveys.

**2002 Kenai River Recreation Use Monitoring Study
Comparison of 1992 and 2002 Responses**

**Compiled by Greg Brown
Alaska Pacific University
11/14/02**

1. Finding: A higher percentage of interview respondents used guides in 1992 than 2002.

YRSTUDY * Use Guide? Crosstabulation

			Use Guide?		Total
			Yes	No	
YRSTUDY	1992	Count	175	345	520
		% within YRSTUDY	33.7%	66.3%	100.0%
	2002	Count	32	123	155
		% within YRSTUDY	20.6%	79.4%	100.0%
Total		Count	207	468	675
		% within YRSTUDY	30.7%	69.3%	100.0%

2. Finding: A higher percentage of interview respondents in 2002 were landowners.

YRSTUDY * Own land? Crosstabulation

			Own land?		Total
			Yes	No	
YRSTUDY	1992	Count	16	503	519
		% within YRSTUDY	3.1%	96.9%	100.0%
	2002	Count	21	133	154
		% within YRSTUDY	13.6%	86.4%	100.0%
Total		Count	37	636	673
		% within YRSTUDY	5.5%	94.5%	100.0%

3. Finding: The 2002 respondents reported catching more fish (on average) than 1992 respondents. Result is statistically significant (p < .05).

Report

Number of fish caught today

YRSTUDY	Mean	N	Std. Deviation
1992	1.52	520	1.99
2002	2.08	148	3.78
Total	1.65	668	2.51

4. Finding: 2002 respondents reported feeling more crowded (using 9 point crowding scale) than 1992 respondents. These results are statistically significant (p < .05) treating the crowding scale as either nominal level (Chi-square) or interval (ANOVA).

YRSTUDY * Crowding Scale Crosstabulation

% within YRSTUDY		Crowding Scale									Total
		1	2	3	4	5	6	7	8	9	
YRSTUDY	1992	12.2%	10.3%	12.0%	15.4%	12.0%	13.5%	10.7%	6.6%	7.5%	100.0%
	2002	14.4%	5.2%	7.2%	14.4%	12.4%	8.5%	14.4%	9.8%	13.7%	100.0%
Total		12.7%	9.0%	10.8%	15.1%	12.1%	12.2%	11.6%	7.4%	9.0%	100.0%

Group Statistics

	YRSTUDY	N	Mean	Std. Deviation	Std. Error Mean
Crowding Scale	1992	468	4.66	2.40	.11
	2002	153	5.20	2.64	.21

5. Finding: 2002 respondents indicated use levels were higher than 1992 respondents (p < .05).

YRSTUDY * Use Level Today Crosstabulation

% within YRSTUDY		Use Level Today					Total
		Too low	Low	About right	High	Too high	
YRSTUDY	1992	2.2%	7.9%	55.8%	28.9%	5.3%	100.0%
	2002	2.6%	9.8%	43.1%	28.1%	16.3%	100.0%
Total		2.3%	8.3%	52.9%	28.7%	7.9%	100.0%

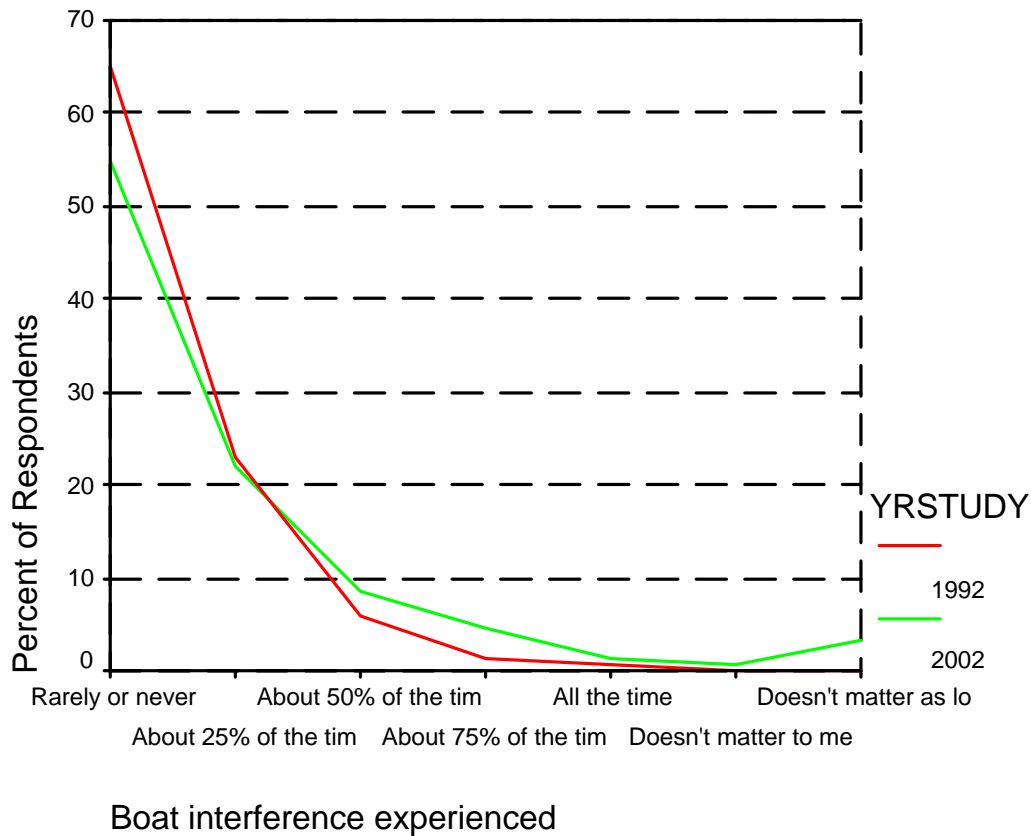
Group Statistics

	YRSTUDY	N	Mean	Std. Deviation	Std. Error Mean
Use Level Today	1992	509	3.27	.77	3.41E-02
	2002	153	3.46	.97	7.81E-02

6. Finding: 2002 respondents reported slightly more boat interference than 1992 respondents (p = .045).

YRSTUDY * Boat interference experienced Crosstabulation

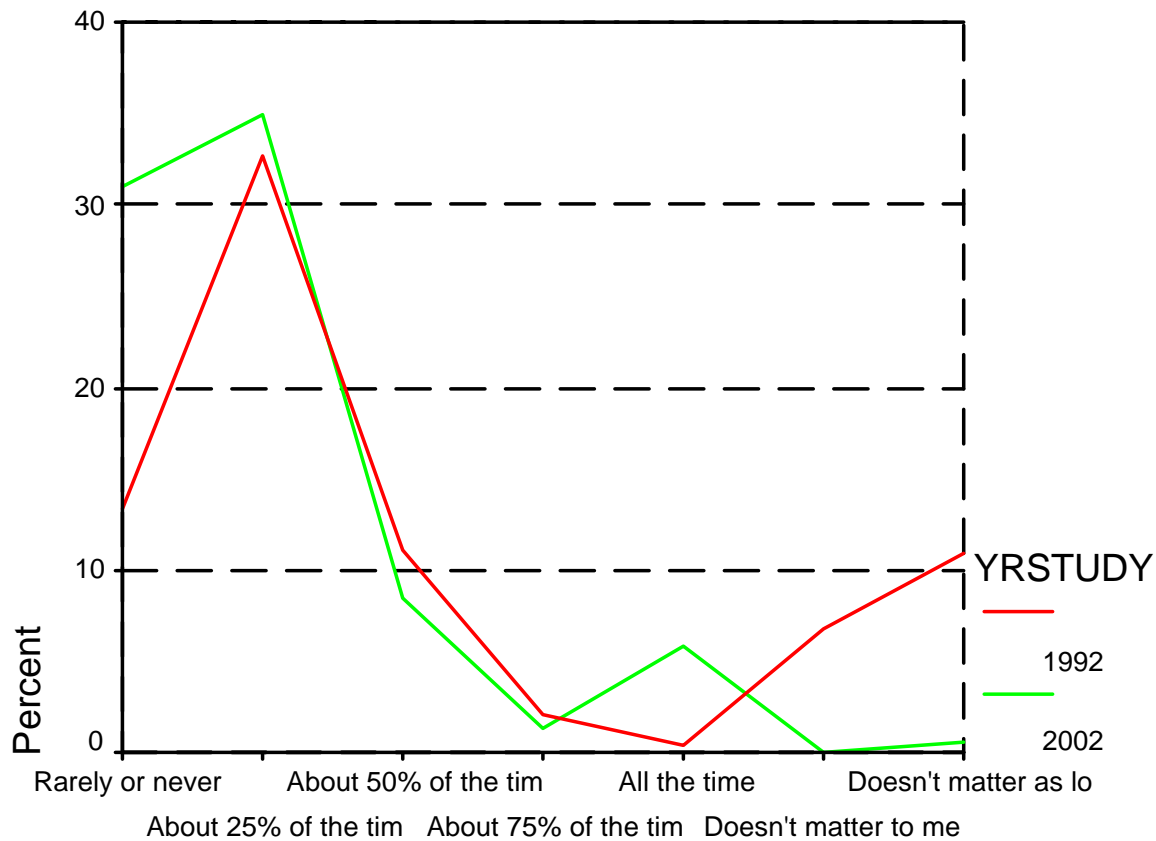
			Boat interference experienced					Total
			Rarely or never	About 25% of the time	About 50% of the time	About 75% of the time	All the time	
YRSTUDY	1992	Count	339	120	31	7	3	500
		% within YRSTUDY	67.8%	24.0%	6.2%	1.4%	.6%	100.0%
	2002	Count	85	34	13	7	2	141
		% within YRSTUDY	60.3%	24.1%	9.2%	5.0%	1.4%	100.0%
Total		Count	424	154	44	14	5	641
		% within YRSTUDY	66.1%	24.0%	6.9%	2.2%	.8%	100.0%



7. Finding: 2002 respondents were less tolerant of boat interference than 1992 respondents (p < .05).

YRSTUDY * Boat interference acceptable Crosstabulation

			Boat interference acceptable					Total
			Rarely or never	About 25% of the time	About 50% of the time	About 75% of the time	All the time	
YRSTUDY	1992	Count	70	171	58	11	2	312
		% within YRSTUDY	22.4%	54.8%	18.6%	3.5%	.6%	100.0%
	2002	Count	48	54	13	2	9	126
		% within YRSTUDY	38.1%	42.9%	10.3%	1.6%	7.1%	100.0%
Total		Count	118	225	71	13	11	438
		% within YRSTUDY	26.9%	51.4%	16.2%	3.0%	2.5%	100.0%

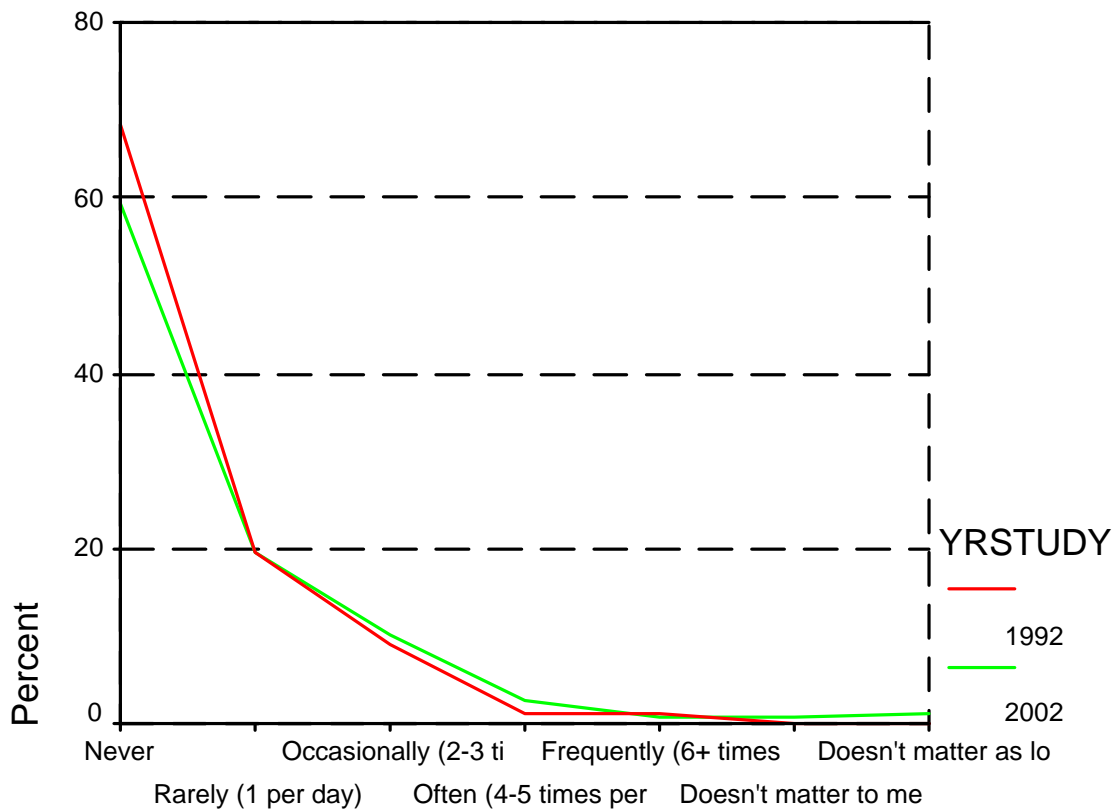


Boat interference acceptable

8. Finding: There was no difference in angler experienced problems between 1992 and 2002 respondents (p > .05).

YRSTUDY * Angler problems experienced Crosstabulation

			Angler problems experienced					Total
			Never	Rarely (1 per day)	Occasionally (2-3 times per day)	Often (4-5 times per day)	Frequently (6+ times per day)	
YRSTUDY 1992	Count		356	101	47	5	5	514
	% within YRSTUDY		69.3%	19.6%	9.1%	1.0%	1.0%	100.0%
2002	Count		92	30	16	4	1	143
	% within YRSTUDY		64.3%	21.0%	11.2%	2.8%	.7%	100.0%
Total	Count		448	131	63	9	6	657
	% within YRSTUDY		68.2%	19.9%	9.6%	1.4%	.9%	100.0%

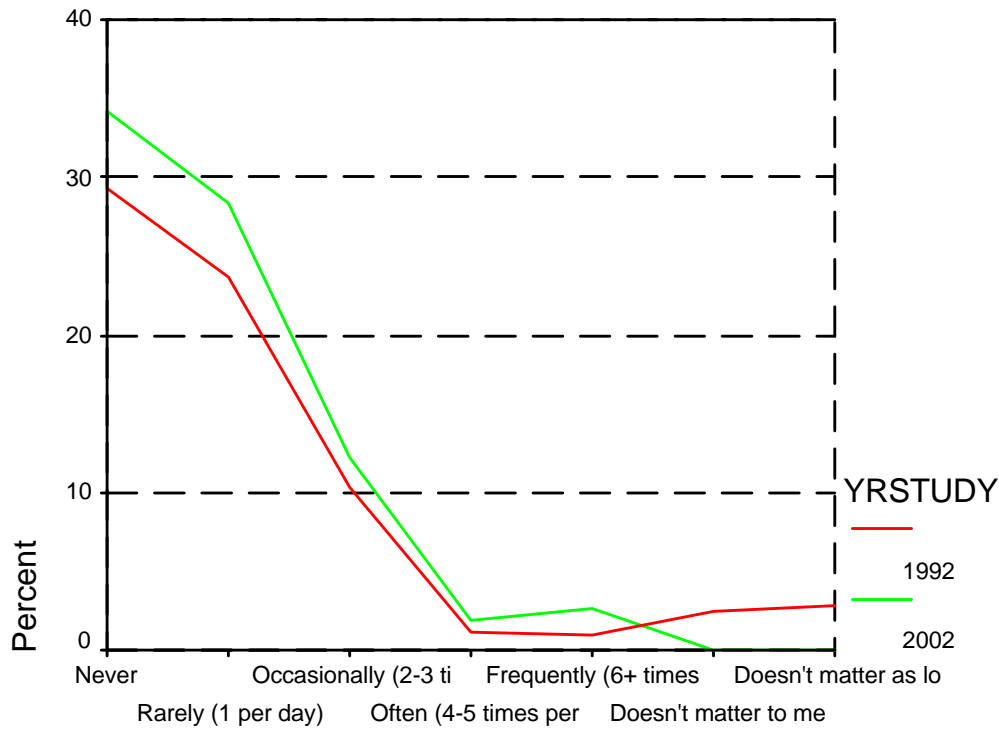


Angler problems experienced

9. Finding: There was no difference in acceptable angler problems between 1992 and 2002 respondents (p > .05).

YRSTUDY * Angler problems acceptable Crosstabulation

			Angler problems acceptable					Total
			Never	Rarely (1 per day)	Occasionally (2-3 times per day)	Often (4-5 times per day)	Frequently (6+ times per day)	
YRSTUDY 1992	Count		153	124	54	6	5	342
	% within YRSTUDY		44.7%	36.3%	15.8%	1.8%	1.5%	100.0%
2002	Count		53	44	19	3	4	123
	% within YRSTUDY		43.1%	35.8%	15.4%	2.4%	3.3%	100.0%
Total	Count		206	168	73	9	9	465
	% within YRSTUDY		44.3%	36.1%	15.7%	1.9%	1.9%	100.0%

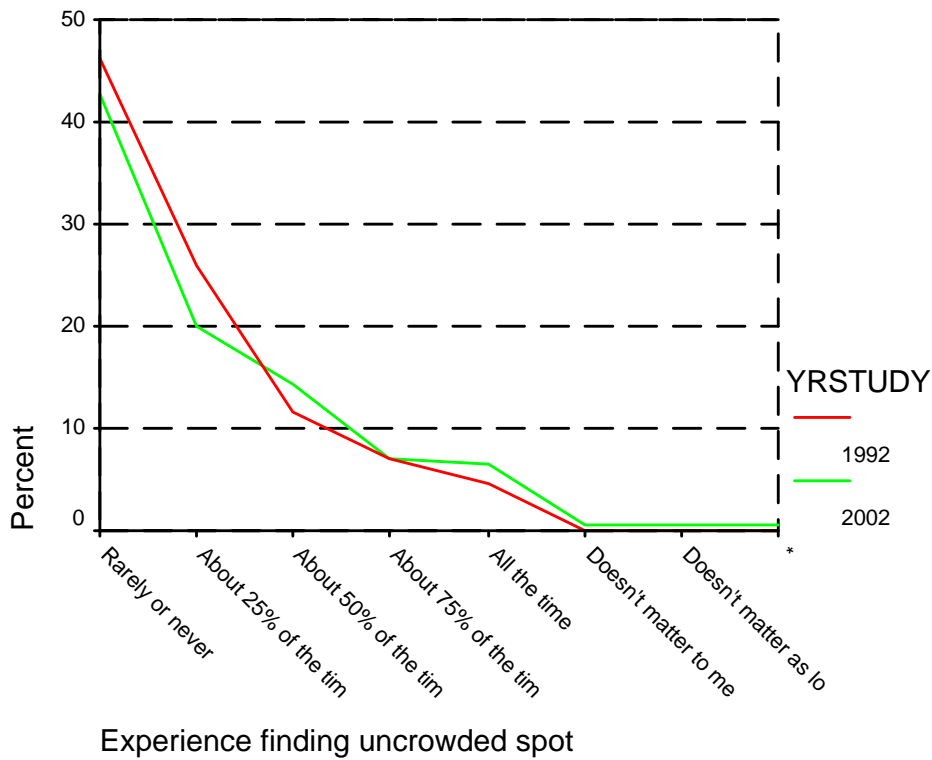


Angler problems acceptable

10. Finding: There was no difference in finding uncrowded spot between 1992 and 2002 respondents (p > .05).

YRSTUDY * Experience finding uncrowded spot Crosstabulation

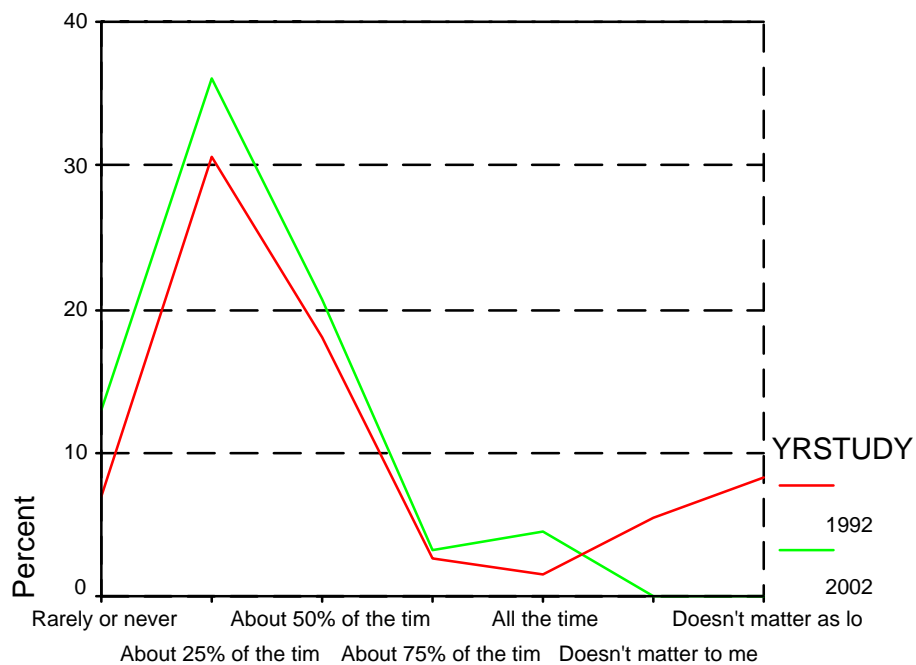
			Experience finding uncrowded spot					Total
			Rarely or never	About 25% of the time	About 50% of the time	About 75% of the time	All the time	
YRSTUDY	1992	Count	241	136	61	36	24	498
		% within YRSTUDY	48.4%	27.3%	12.2%	7.2%	4.8%	100.0%
	2002	Count	66	31	22	11	10	140
		% within YRSTUDY	47.1%	22.1%	15.7%	7.9%	7.1%	100.0%
Total		Count	307	167	83	47	34	638
		% within YRSTUDY	48.1%	26.2%	13.0%	7.4%	5.3%	100.0%



11. Finding: There was no difference in the acceptability of finding uncrowded spot between 1992 and 2002 respondents (p > .05).

YRSTUDY * Acceptable level in finding uncrowded spot Crosstabulation

			Acceptable level in finding uncrowded spot					Total
			Rarely or never	About 25% of the time	About 50% of the time	About 75% of the time	All the time	
YRSTUDY	1992	Count	36	160	94	14	8	312
		% within YRSTUDY	11.5%	51.3%	30.1%	4.5%	2.6%	100.0%
	2002	Count	20	56	32	5	7	120
		% within YRSTUDY	16.7%	46.7%	26.7%	4.2%	5.8%	100.0%
Total		Count	56	216	126	19	15	432
		% within YRSTUDY	13.0%	50.0%	29.2%	4.4%	3.5%	100.0%



Acceptable level in finding uncrowded spot

12. Finding: 2002 respondents were more supportive of limiting guided use or the number of fishing guides (p < .05). There was no difference between 1992 and 2002 responses in limiting the number of users during peak times, closing the facilities when full, or increasing non-motorized areas.

Report

YRSTUDY		Limit the number of users at peak periods by a permit system	Close facilities when full	Limit guide use or the number of fishing guides	Increase non-motorized areas
1992	Mean	2.68	3.20	3.50	2.89
	N	469	469	478	468
	Std. Deviation	1.21	1.18	1.33	1.20
2002	Mean	2.74	3.08	4.05	2.82
	N	143	143	148	143
	Std. Deviation	1.30	1.20	1.26	1.29
Total	Mean	2.69	3.17	3.63	2.88
	N	612	612	626	611
	Std. Deviation	1.23	1.19	1.33	1.22

2002 Survey data

Support/Opposition for Potential Crowding Policies (1=Strongly Oppose 3=Neutral 5=Strongly Support)

	N	Minimum	Maximum	Mean	Std. Deviation
Expand non-motorized fishing days	144	1	5	2.89	1.34
Restrict use to specific fishing at certain times or areas	142	1	5	3.04	1.19
Limit the number of users at peak periods by a permit system	143	1	5	2.74	1.30
Close facilities when full	143	1	5	3.08	1.20
Limit guide use or the number of fishing guides	148	1	5	4.05	1.26
Increase non-motorized areas	143	1	5	2.82	1.29
Limit number of boats in any section of river at a time	137	1	5	2.69	1.26
Valid N (listwise)	134				

GPS TRACKING – PILOT PROJECT

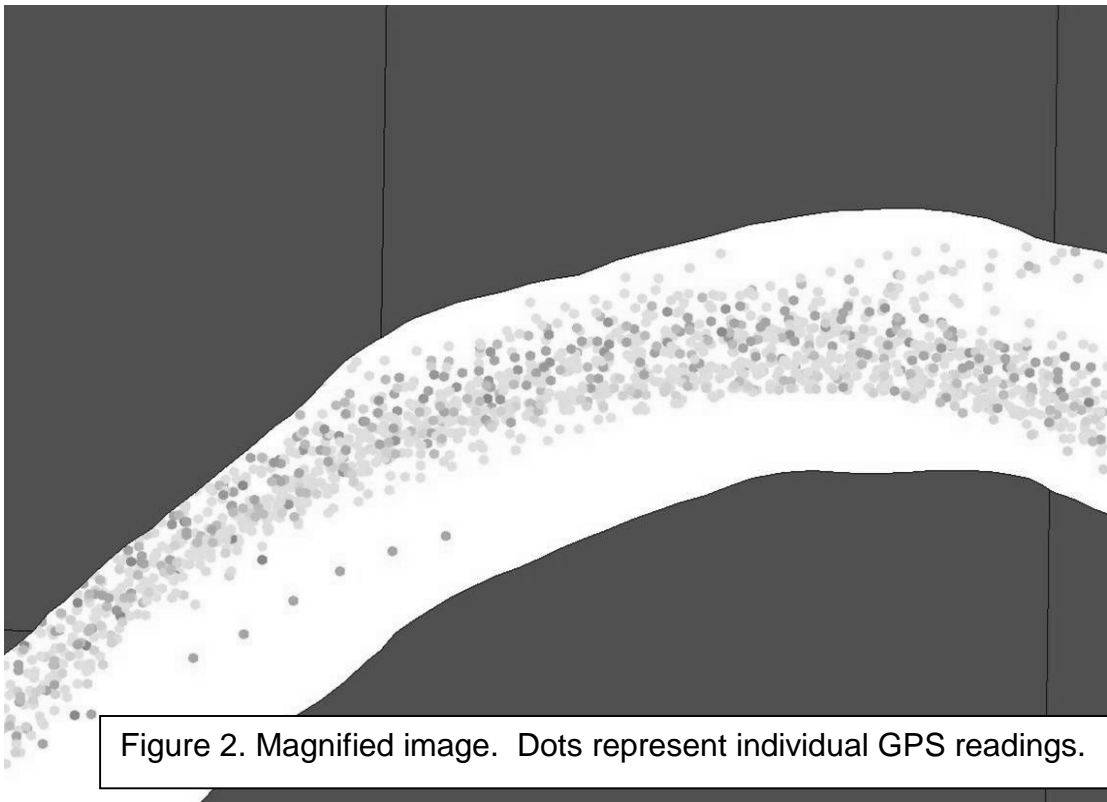
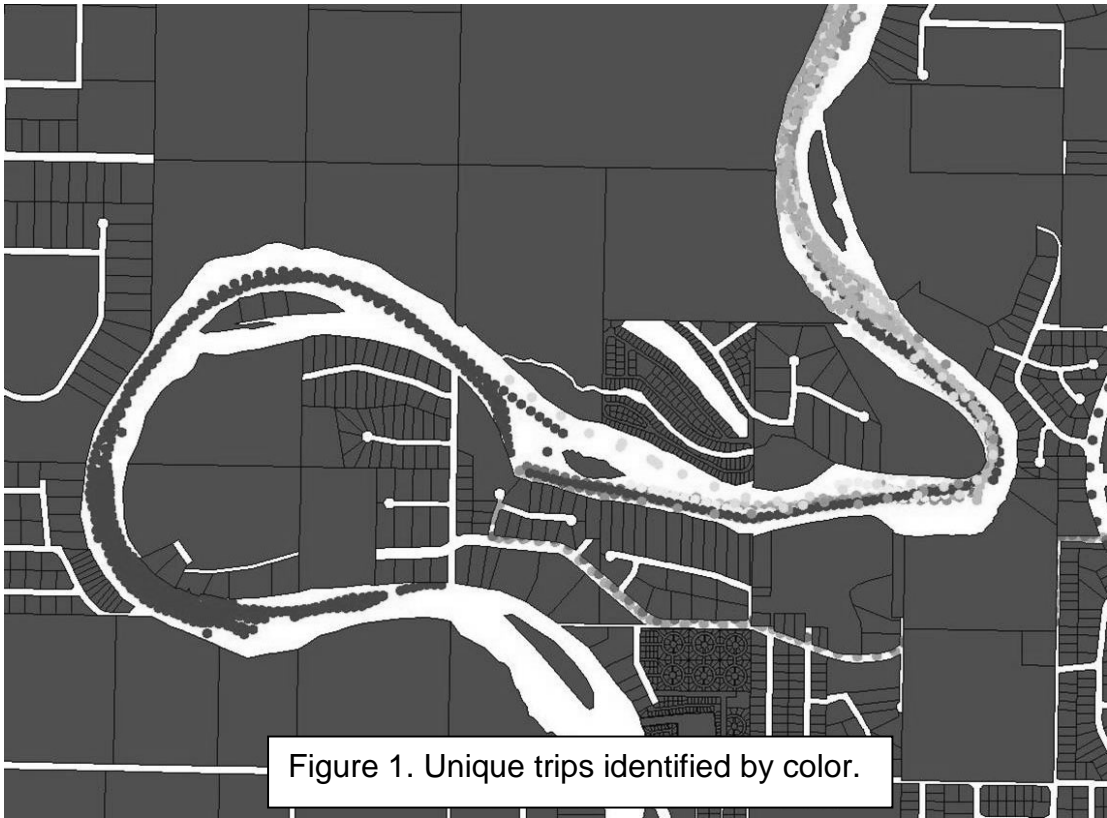
The monitoring study included a pilot test of GPS technology to spatially describe powerboat usage on the Kenai. The goal of the pilot test was to place up to 10 real-time GPS data loggers per day on various types of boats—guided, rental, and private. At the end of the boat trip, the data from the GPS unit would be downloaded and combined with other boat trips on the river. Geographic Information System (GIS) software would be used to analyze and describe boat usage—density, areas of high/low use, river use by time of day and day of the week, guided versus private, boat speed by river section, and other spatial questions.

As a pilot study, there were two primary questions—would the GPS technology work on the Kenai in powerboats and would boaters be willing to volunteer to take a GPS unit on their trip. The pilot test showed that obtaining volunteers to take a GPS unit on their boat trip was more challenging than anticipated. In all, a total of 26 boat trips were logged with GPS units. No GIS data analysis was performed because of the limited data set. On the positive side, the GPS technology appeared to work quite well. The units that went out on the boats successfully logging boat location at 3 second intervals. A table of the type of data collected by the individual GPS units appears below:

ASSIGNED_T	UNIT_IDENT	TRACKID	LONGITUDE	LATITUDE	TIME	DATE	SPEED
Individual	Kenai3	14	-151.1008850	60.51529333	5:47:31	7/4/2002	26.74411437
Individual	Kenai3	14	-151.1007233	60.51636833	5:47:41	7/4/2002	22.31361350
Individual	Kenai3	14	-151.1001433	60.51579500	5:49:21	7/4/2002	18.60810367
Individual	Kenai3	14	-151.0995950	60.51505333	5:49:31	7/4/2002	18.65413485
Individual	Kenai3	14	-151.0987217	60.51451333	5:49:41	7/4/2002	17.42280084
Individual	Kenai3	14	-151.0977667	60.51394333	5:49:51	7/4/2002	18.70016603
Individual	Kenai3	14	-151.0968383	60.51334500	5:50:01	7/4/2002	18.06723733
Individual	Kenai3	14	-151.0957000	60.51283167	5:50:11	7/4/2002	18.35493220
Individual	Kenai3	14	-151.0944650	60.51237833	5:50:21	7/4/2002	18.32040881
Individual	Kenai3	14	-151.0932167	60.51194833	5:50:31	7/4/2002	19.28706355

Should the GPS data collection be attempted again next season, a more effective method will need to be developed to obtain boat volunteers.

Following are examples of GPS maps generated during this part of the project.



VIDEO RECORDING - Video cameras were used to document real time activity at certain times and locations on the river. Nine separate video sessions (1 hour – 2.5 hours in length) were recorded at Beaver Creek Hole and the Crossover, and provide a record of activity at those times and locations. While the videos recorded varying levels of activity, including some very crowded times, no apparent conflicts were observable. The video tapes will be retained for comparison in future years.

CONCLUSIONS –

One of the objectives of this monitoring project was to document conditions during the 2002 season and compare this data with similar data collected in 1992. Since many of the survey questions were duplicated in 2002, it was possible to compare changes, if any, in the past decade.

2002 was an unusual year due to management changes implemented by the Department of Fish and Game to protect an unusually weak first run of king salmon. Consequently, little to no fishing occurred in the project area for much of June, and then for the first half of July, anglers were compressed into the lower 21 miles of the Kenai River (project area) instead of having fishing access to the usual 50 miles available between Skilak Lake and the river mouth.

The 2002 data indicates an increase in perceived crowding and use levels compared to 1992, but there was no change in the reported level of difficulty in finding an uncrowded spot. The 2002 respondents reported a small increase in the amount of interference by other boaters, but respondents reported no significant increase in angler-related problems.

The 2002 responses reflect a somewhat greater intolerance of boater interference, particularly among local landowners. Between 1992 and 2002, there was an increase in the category of respondents least tolerant of boater interference (22% to 38%). This change from 1992 to 2002 consisted of two elements: 1) a higher percentage of all respondents in 2002 that chose the least tolerant boater interference category, and 2) about 15% more landowners than non-landowners who selected the least tolerant boater interference category. Although not statistically significant, local landowners expressed somewhat greater dissatisfaction with their Kenai River experience than non-landowners.

A shift towards greater support for limiting guided use or the number of fishing guides is noted in the 2002 data as compared to the 1992 data. Written comments attached to the surveys also reflect a passion for this subject by many of the respondents. (Appendix C) The survey results mirror the prevailing public perception supporting limits on guides, and may be an indication that this particular issue is a strong issue for continued evaluation and management attention.

As for other suggested management actions (expand non-motorized days, restrict use to specific fishing methods, limit the number of users at peak periods by a permit system, close facilities when full, increase non-motorized areas, or limit the number of boats in any one section of the river at a time), respondents did not provide clear support (nor opposition) to these options. Therefore, it would not be advisable to pursue any of these options at this point.

It should be noted that the 1992 survey indicated a high level of perceived crowding in the lower river among boaters, and this was reflected again in 2002 with a slight shift toward higher crowding perceptions. Overall crowding measures can provide a useful indicator for comparison, both with previous surveys and with surveys on other recreation rivers. 80.4% of the respondents reported some degree of crowding, which groups the lower Kenai River in with some of the most crowded rivers in the country.

In spite of the perceived crowding, nearly 80% of the respondents reported that they were satisfied or very satisfied with their experience. This may be a result of users adjusting their expectations and preferences so they fit with the experience available in a given place and time.

The Monday (unguided drift only) respondents perceived less crowding and lower use levels than non-Monday users, but paradoxically, reported lower overall satisfaction with their experience. There was no difference in the experienced level of boater interference. Sunday (unguided use only) respondents also perceived less crowding but there was no difference in perceived recreation use level or boater interference. There was also no difference in overall satisfaction between Sunday and non-Sunday respondents. These results indicate less congestion on the river on Sundays and Mondays, but this outcome does not appear to affect the perception of boater interference experienced or increased user satisfaction levels with the recreation experience.

Since most interviews were conducted in July and river use might differ from the beginning to the end of the month, early July responses (July 1-15) were compared with late July responses (July 16-31). There were no differences in respondent perceptions of crowding, use levels, or overall satisfaction.

The 2002 monitoring results are suggestive but not conclusive. While statistically significant differences between 1992 and 2002 were found on a number of quality of recreation measures, the differences were not quantitatively large. Differences in respondent perceptions of crowding, higher use levels and interference by other boaters could also be attributed to the compressed crowding caused by ADF&G Emergency Orders intended to protect a weak stock of kings.

RECOMMENDATIONS –

- Continue conducting similar monitoring projects annually to detect changes or trends in recreational use, impacts and tolerance to those impacts or acceptance to various management alternatives.
 - Consider collecting data in the Lower River Project Area in 2003 since the 2002 season was unusual due to fishery closures.
 - Ensure that ample surveys are obtained from represented groups.
 - Develop a schedule for sampling different sections of the river over the coming years.
- Develop a plan for improving the GPS tracking program to collect more data about river dynamics of the various user groups.
- Consider changes to the on-site survey questionnaire, such as:
 - Identify the causes of boating interference – who caused it?

ACKNOWLEDGMENTS –

Professional Guidance - Dr. Greg Brown, Associate Professor in the Environmental Science Department at Alaska Pacific University, has provided project design advice to DPOR and the KRSMA Advisory Board. He conducted the analysis of the survey and GPS data, and offered guidance on summary conclusions from that analysis.

Staffing – Two Park volunteers were assigned to the project, with one of them taking the lead role in project management. Eve Dreyer was responsible for conducting all of the surveys, inputting data and managing the GPS project. Bob Daugherty, worked part time on this project and assisted with equipment preparation and video recording of river use.

Appendix A

TIME _____ DATE _____

2002 KENAI RIVER RECREATION USE STUDY LOWER RIVER BOATERS

Zip Code _____

LOCATION _____ WEATHER _____

SECTION I.

1. How satisfied are you with your fishing experience today?

Very unsatisfied	Unsatisfied	Neither	Satisfied	Very satisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. If you did not have an enjoyable time, explain:

3. Which species were you fishing for today?

king salmon silver salmon red salmon
 pink salmon rainbow trout Dolly Varden

4. How many fish did you catch today? _____ fish

5. Did you use the services of a professional guide today?
 Yes No

6. Do you own land along the Kenai River? Yes No

7. How many times would you estimate that you have fished
the Kenai River in your lifetime? _____ Times

8. What type of boat did you use today?

Power boat Drift boat

9. How crowded did you feel today? (circle one number)

1	2	3	4	5	6	7	8	9
Not at all crowded	Slightly crowded		Moderately crowded		Extremely crowded			

10. Based on the kind of recreation experience you want on
the river, how would you describe the use level today?

Too low Low About right High Too high

SECTION II.

Please check the box in the left hand column that describes what you experienced today. In the right hand column, check the box that describes what you would tolerate before your experience becomes unpleasant.

(note: if the experience doesn't matter to you, check the appropriate box)

11. How often did boats or other boaters interfere with your ability to fish today?

	What you experienced today	What you will accept
Rarely or never	<input type="checkbox"/>	<input type="checkbox"/>
About 25% of the time	<input type="checkbox"/>	<input type="checkbox"/>
About 50% of the time	<input type="checkbox"/>	<input type="checkbox"/>
About 75% of the time	<input type="checkbox"/>	<input type="checkbox"/>
All the time	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> This doesn't matter to me		
<input type="checkbox"/> This doesn't matter as long as I'm catching fish		

Name: _____
Street/ PO Box _____
City: _____ State: _____
Zip: _____

12. How often did you see other anglers causing problems (such as violating fishing regulations, littering, being aggressive, drinking too much, etc.) today?

	What you experienced today	What you will accept
Never	<input type="checkbox"/>	<input type="checkbox"/>
Rarely (1 per day)	<input type="checkbox"/>	<input type="checkbox"/>
Occasionally (2-3 times per day)	<input type="checkbox"/>	<input type="checkbox"/>
Often (4-5 times per day)	<input type="checkbox"/>	<input type="checkbox"/>
Frequently (6+ times per day)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> This doesn't matter to me		
<input type="checkbox"/> This doesn't matter to me as long as I'm catching fish		

13. How often did you have trouble finding an uncrowded fishing spot today?

	What you experienced today	What you will accept
Rarely or never	<input type="checkbox"/>	<input type="checkbox"/>
About 25% of the time	<input type="checkbox"/>	<input type="checkbox"/>
About 50% of the time	<input type="checkbox"/>	<input type="checkbox"/>
About 75% of the time	<input type="checkbox"/>	<input type="checkbox"/>
All the time	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> This doesn't matter to me		
<input type="checkbox"/> This doesn't matter as long as I'm catching fish		

Section III.

There are many ways to address overuse problems. Some possible solutions are listed below. Tell us how you feel about each or suggest your own

	Strongly oppose	Oppose	Neutral	Support	Strongly support
Expand non-motorized fishing days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrict use to specific fishing methods at certain times or areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limit the number of users at peak periods by a permit system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Close facilities when full	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limit guide use or the number of fishing guides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase non-motorized areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limit the number of boats in any section of the river at a time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other _____

Section IV.

General comments/ What was the most enjoyable and/or least enjoyable part of your river experience?

Your comments are valuable in helping us better manage recreation use on the Kenai River. We would appreciate the opportunity to develop a list of Kenai River recreation users for future surveys. Please write your name and address in the space to the left. All responses will be kept confidential.

Alaska Department of Natural Resources



Appendix B – 2002 Survey Schedule

Sat., June 1	11:00 a.m. – 1:30 p.m.	Pillars
Sun., June 2	11:00 am – 3:00 pm	Pillars
Tues., June 4	4:30 pm – 6:30 pm	Pillars
Sat., June 8	11:20 am – 2:00 pm 5:00 pm – 6:30 pm	Centennial Campground Pillars
Sun., June 9	12:20 pm – 5:45 pm	Pillars
Mon., July 1	11 am – 3:00 pm	Pillars
Tues., July 2	12:20 pm – 6:30 pm	Pillars
Wed., July 3	11:30 am – 2:30 pm 4:00 pm – 6:00 pm	Pillars Centennial Campground
Sat., July 6	11:30 am – 2:00 pm 6:30 pm – 7:30 pm	Pillars Pillars
Mon., July 8	11:30 am – 5:00 pm	Pillars
Tues., July 9	11:45 am – 2:00 pm	Pillars
Wed., July 10	7:30 am – 11:00 am 5:45 pm – 8:00 pm	Centennial Campground Pillars
Mon., July 15	1:00 pm – 5:00 pm	Pillars
Tues., July 16	2:00 pm – 3:15 pm 4:30 pm – 7:15 pm	Pillars
Fri., July 19	3:00 pm – 7:00 pm	Pillars
Sun., July 21	11:30 am – 4:00 pm	Pillars
Mon., July 22	12:30 pm – 4:30 pm	Pillars
Sun., July 28	1:30 pm – 6:00 pm	Pillars
Tues., July 30	2:00 pm 5:00 pm	Pillars

Appendix C – Written Survey Comments – 2002

The following comments were included in various surveys under Section III (suggestions for management changes), or Section IV, (an area on the survey where one could include written general comments). The number for each comment relates to the survey number in the database.

3. Glad to see a Trooper here; Guides are a problem, they impact the river by far than any other boats; Restrict number of guides; Needs to be no more than 100; Very Aggressive; Think they own the river
4. Limit guides to 1 trip a day; used to be a guide until mid 80's; Changed professions when it got too crowded
5. Happy about the way it is
6. Oppose bait regulations
8. Good experience with Guide
10. Protect the Spawning areas/ Try to protect nature like shores
13. This is a wonderful river - Protect it at all costs
14. Close to Kings Above Soldotna Bridge
15. State Fish and Game need to patrol Mondays and Sundays/ Guides fish when they are not supposed to/ Limit Guides - If you don't live in the state you don't guide here or pay extra/ 1 Guide license for 1 guide/1 boat/ Impossible to limit number of boats in any one section of the river at specific times.
16. Always an enjoyable time on the river. People are always courteous for the most part.
17. More fish in the water/ if there in no fish they need to close the river no matter whether it is June, July or August. / No fish, no river use!
18. Don't like to be out when guides are out/ they can get carried away. / Keep local guides and limit out of staters.
19. Needs to be regulation of guides taking clients out and dropping them off on the riverbanks. / Make Mondays just for Drift Boats as in the past. /Pertaining to the second option in Section III, we are already restricting specific fishing methods at certain times or areas/ who will determine that? Too many to keep track of on the river. YES! Limit guides. See many, many guides with 8 or 9 boats. They bring in college kids who don't know what they are doing.
20. Leave non-motorized as is for now, but might need regulation in the future/ Used to be great fishing. It is tougher now. The guides are working themselves out of the good graces of the people.
21. Limit Guides anyway you can/Have more public boat ramps to pull out at the lower river.

22. This should be a sport river fishing only, not money making/ Its the business Guides who harvest the most salmon/ Too many parties with 4-5 people each time/ We own land in Soldotna not on the River/ Share for Guides
23. Shouldn't close river at all/ Limit guides to # fish caught/ Catch and Release Don't really kill the fish.
24. How would they limit the number of boats in any one section of the river at a time/ On increasing non motorized areas, it doesn't matter as long as there are non-motorized fishing days
25. Depend on how you do it/ Not the same as it used to be/ Residents should get first chance/ less guide fishing Areas/ Fix the guide problem
26. It was very crowded for a drift day/ Sure are a lot of guide boats from Kasilof
27. Strongly supports shutting down the King fisheries for 6 years/ anything that keeps more fish in the river
28. Close the River 2-3 times per week/ More than one day/ Close Spawning areas above Bing's
29. Should limit # of out of State guides/ they are taking advantage of resources/ Make them pay/ Limit amt./ period of guides in river
30. I'm just a visitor and can't dictate what happens to the locals. This is my third time out and people here are much more courteous than people in Colorado.
33. Limiting the number of boats in any one section of the river at a time will be tough to manage. Had a good experience. Everyone was courteous for the amount of people there. Close facilities when full would be tough to manage, and I would support it if they find a new place to open up.
34. When facilities are full the guides get most of the space and locals are out. Too many guides. Would be glad to see less motorboats and more drift boats.
35. It would be hard to limit the number of boats on any one section of the river at a time. Limit the number of boats total but that would be hard to do.
37. To limit the number of boats in any one section of the river at a time would be hard to implement. Everything went well.
38. There are a lot of guides up here. I know they are making a living but...
40. Very enjoyable experience. Will come back. Fish were a nice size and the people were really nice. It looked like a parking lot near Mud Island and saw caribou.
43. Take out of stater's out of guide boats.

44. I'm from CT. and can't make comments about how to manage the river here. It will affect local Alaskans, and I don't want out of staters coming to my state and telling me what to do with our rivers.
48. Some people just go too fast!
49. Limiting the number of boats in any one section of the river at a time is too broad. On powerboat days, I am a drift boat fisherman and powerboats interfere all of the time. Increase nonmotorized in prime fishing spots, also. Downstream of Eagle Rock powerboats can have. Limit commercial guided activity. Avoid listening to Brett Huber. Brett Huber wants the Kenai for a white collared, high dollar playground.
50. More drift days. Mondays are real nice. We can't lose them.
51. Enjoyed it, last year. Had to a relative get overly yelled at for not catching fish fast enough. Didn't enjoy that.
52. Good Experience for me. Been out here 3 or 4 times and always had a good time. It is nice to see the agencies ... Fish and Game & State Parks patrolling the river. See a lot of support.
55. Limit out of state guides. They come up here. They don't live up here. They take their money and go back to their state. It's not helping our economy. Guides who guide here should live here.
57. I love to fish 4AM till 6AM and on Sundays. The magnitude of 300 Guide boats coming at once just ruins a good Experience. I would like Guides Limited to 1 Trip per day from 8AM till 4Pm and let them raise their prices to keep income up. This will eliminate many out of state operations. Also, have one day of full closure from all boats, 1 day per week.
59. Restrict use of commercial net setters at the mouth of the river. / They shouldn't allow them to fish shouldn't allow them to fish the 1st 2-300 ft. of area along the beach. They block Kings up and don't let them up. The Kings need a corridor/ safe haven to let them to run up along the shore. You have to regulate across the board. You can't conserve the river with out changing everything/ fishing practices. We want Fish and Game to manage the fish for the fish, not the users. For example, close from Soldotna upstream.
60. Close bridge up to King Fishing. You can't limit Access to specific people. I spent 12 years trying to change things but Politics rule! Formalities to pacify people is JUNK!
61. Lot of guide traffic
63. 1 boat per guide, max guides 100, No use of state property for guide purposes.
65. Instead of any kind of catch & release Oppose... make it 1 King limit & that will secure that it would be catch and release until they caught the king they were satisfied with.
66. Enjoyed it. Got fish the other day.
67. Had a great experience.

68. Cut down the number of Guides. They are so crazy up here you can't just fish. Won't come out because it is too full.
69. Power Boats were coming back full speed and extremely close. Have a training Program For the guides on river courtesy.
70. Ability to get out on the river/ the high # of guides on the river
71. All of the guides that fish in river should be Alaskans. Everyone has a right to fish in the river. Sometimes you just have to put up with the Bullshit.
74. I love the Kenai River
75. For questions 11a/b and 13a/b see comments; #11 - With guide services, no problem, but would be difficult on my own
76. Guide boats must be limited - the least enjoyable part of my river experience is the number of guides. To ensure the continuation of not only private users but actual targeted escapement of spawning fish the guides must be limited.
77. Good Ramp (excellent)
78. Need someone at the Pillars to direct and guide up to boat ramp.
82. Without a doubt the most enjoyable part of my experience was catching my first King Salmon of 48lbs. It was amazing!!
83. My son, 9, caught his first red salmon today!! It was great.
84. Scenery
85. Just being on the Kenai.
87. Unrestricted fishing only!! Comment on 11a- somewhat lower boater experience. Comment on 12- I give what I get. Comment on 13 - buying an airplane to fish alone. Rural preference is racist!! AK residents should have preference.
88. Catching Fish. Too many guide boats!
89. To guide on this river you must be an AK resident that qualifies for the permanent dividend fund.
90. Limit boat rentals and campground guiding, e.g., Kenai Riverbend Campground; would like to see aggressive law enforcement against law breaking guides by removing them from the river. When a guide is reported for breaking the law would very much like feedback on the investigation and result of the investigation and result of the reporting.
91. No guides, Drift boats only.
92. Motor less days should be motor less. Reduce pressure, very pleasant. Least Enjoyable: We saw many anglers snagging and keeping reds. Would like to see more fish and game

personal on the river. There is a lot of illegal activity on the river Guides - NO out of state guides. Must be Alaskan residents.

- 93. Great weather/ slow/ 14b fish/ Park User fees should go back to the parks.
- 94. Good friends. Good fishing. Good weather.
- 100. Too many out of state guides. We love the area. Too many guides.
- 102. There are too many commercial fishing guides out in the ocean. They are a great impact on the number of fish that get into the river.
- 103. Catching 4 fish in our party of 4. Nice size fish!
- 105. Limit guide use, more fishing with my wife; Comment on question 12 - Saw couple 2002 guide boats misbehaving
- 107. Make Monday no motorboats period.
- 108. Way too many guides/ more days that guides can't fish like on Sun. Catching fish: best/ seeing all the guides: worst.
- 109. Liked most: catching fish Least: crowding
- 111. Need to start restricting number of guides
- 112. For limit number of guide use or the number of fishing guides - There should be so many and they should do some sort of apprenticeship If you come from a state that doesn't have to pay reciprocity than you shouldn't have to pay it.
- 114. Less Motor boats 1. Less Guides 2. Less Power Boats
- 115. Great Day
- 117. Caught the amount of fish we wanted
- 119. Restrict guides not unguided. Do not restrict public access
- 120. Don't mess with any more limitations of fishing, people can choose when or when not to fish. Guides should be limited to one charter/ day would reduce traffic considerably
- 121. Time with friends is always special and the river is the place.
- 122. Safety Lessons a strong issue after on this river - feel strongly we should limit guided on the river
- 124. Leave sections of this survey for residents ONLY to answer
- 125. Number of fish caught
- 128. No boats

129. 5 of us fishing
131. Limit the number of days in a row for commercial fishing. Disappointed about no fish saw very little action across the river in a 4hr span.
133. Being able to fish
134. Limit guides to 1 trip a day, catching fish was great
135. Guides limited to 1 trip limited hours/ days Too many guides, need not close for 3 weeks of June, at least catch and release; need to accommodate***residents, guides from Alaska only!!!
136. Certain areas were very crowded and I think limit guides to residents only and numbers
137. We had a nice time except for no fish.
138. Tell the truth in the tourist info. About conditions! (Crowded!) Catching 1st King. For as crowded as it was the guides and people were very courteous.
140. Enjoying the wildlife
141. Great Experience
142. Catching fish
143. Save the river, it is being used to death! Be creative to save the fish.
144. Finally caught a nice size Kenai King salmon. Excellent weather.
145. Control Commercial fishing. Sports fisherman spend 10x more per fish than the income generated by the commercial.
146. Rudeness at Dock!! When Tue. 6am Guides get on the water. Combo guides and rec. all at once/ lack of river educate.
147. We are kayaking/ we paddled at least 350 times. Need to clean up at the end of the year. Kayaking is a blast. We love the river.
149. Reduce Commercialization of the Kenai River sport fishing resource by implementing "limited number of commercial fishing guides!"
150. Guide clients parked in the parking spots. Today quite a few guide and other boats back trolling in a drifting area.
152. Boats interfered with my ability to fish was 10% of the time. Had trouble finding an uncrowded fishing spot about 30% of the time and that is also what I will tolerate before my experience becomes unpleasant. We should restrict methods areas if we justify means of doing it. How would we enforce limiting the number of boats at one part of the river at a

time? The guiding system is a problem at the moment. We need to address that before we start limiting the residents. ,

153. If they limit the guides, they should not use public facilities for commercial. Guides from out of state should not be allowed. You have to be here at 5am to try and get a spot. Same at Eagle Rock. It really burns me up. Cut Guides by 80%, maybe we can

154. Across from my place at mile 19.5, the boats still pull their boats up and ruin the bank!

Appendix D – Tables Showing Statistics Test Results

Finding 4. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.449 ^a	8	.036
Likelihood Ratio	16.655	8	.034
Linear-by-Linear Association	5.478	1	.019
N of Valid Cases	621		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.33.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Crowding Scale	Equal variances assumed	3.166	.076	-2.349	619	.019	-.54	.23	-.99	-8.82E-02	
	Equal variances not assumed			-2.239	239.732	.026	-.54	.24	-1.01	-6.47E-02	

Finding 5. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.471 ^a	4	.000
Likelihood Ratio	19.803	4	.001
Linear-by-Linear Association	5.917	1	.015
N of Valid Cases	662		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 3.47.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Use Level Today	Equal variances assumed	20.871	.000	-2.442	660	.015	-.18	7.55E-02	-.33	-3.61E-02	
	Equal variances not assumed			-2.163	213.184	.032	-.18	8.53E-02	-.35	-1.64E-02	

Finding 6. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.744 ^a	4	.045
Likelihood Ratio	8.408	4	.078
Linear-by-Linear Association	7.273	1	.007
N of Valid Cases	641		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 1.10.

Finding 7. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.698 ^a	4	.000
Likelihood Ratio	29.010	4	.000
Linear-by-Linear Association	.796	1	.372
N of Valid Cases	438		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.16.

Finding 8. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.795 ^a	4	.434
Likelihood Ratio	3.357	4	.500
Linear-by-Linear Association	1.695	1	.193
N of Valid Cases	657		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 1.31.

Finding 9. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.785 ^a	4	.775
Likelihood Ratio	1.623	4	.805
Linear-by-Linear Association	.716	1	.397
N of Valid Cases	465		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.38.

Finding 10. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.324 ^a	4	.505
Likelihood Ratio	3.247	4	.517
Linear-by-Linear Association	1.321	1	.250
N of Valid Cases	638		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.46.

Finding 11. Statistical test results.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.171 ^a	4	.270
Likelihood Ratio	4.841	4	.304
Linear-by-Linear Association	.004	1	.952
N of Valid Cases	432		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.17.

Finding 12. Statistical test results.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Limit the number of users at peak periods by a permit system * YRSTUDY	Between Groups (Combined)		.409	1	.409	.271	.603
	Within Groups		919.452	610	1.507		
	Total		919.861	611			
Close facilities when full * YRSTUDY	Between Groups (Combined)		1.614	1	1.614	1.147	.285
	Within Groups		858.712	610	1.408		
	Total		860.327	611			
Limit guide use or the number of fishing guides * YRSTUDY	Between Groups (Combined)		33.850	1	33.850	19.591	.000
	Within Groups		1078.169	624	1.728		
	Total		1112.019	625			
Increase non-motorized areas * YRSTUDY	Between Groups (Combined)		.616	1	.616	.414	.520
	Within Groups		905.931	609	1.488		
	Total		906.547	610			