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TOURISM & RECREATION RESEARCH

Upper Yellowstone River Monitoring

Usage and User Characteristics

Norma P. Nickerson, Ph.D. & Kara Grau, M.S. 11/18/2020





TOURISM & RECREATION RESEARCH

UNIVERSITY OF MONTANA

Upper Yellowstone River Monitoring: Usage and User Characteristics

Prepared by Norma P. Nickerson, Ph.D. & Kara Grau, M.S.

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Usage on the Upper Yellowstone River between the fishing access sites of Emigrant, MT and Mayor's Landing in Livingston, MT was recorded. Recreationists were surveyed to create a baseline of river use.

Abstract

The purpose of this study was to start a monitoring system for river use in Montana. The Upper Yellowstone River was used to explore monitoring methods and to provide a baseline of use as the pilot study for other Montana waterways. The Upper Yellowstone River was monitored via intercept surveys at fishing access sites (FAS), observation of users at FASs, and recording of types and number of river users floating past the FASs in a 30 mile stretch from Emigrant to Livingston. In addition, cameras were mounted at five private property sites to assess river use floating by. Camera data will be analyzed in a separate report.

Highlights

- The majority of river users (81%) are from Montana. Of Montana users, 44% were from Livingston and 41% were from Bozeman/Belgrade/Gallatin Gateway. 19% are out-of-state visitors.
- 73% of groups at the FAS have at least one fishing license amongst them. This leaves 27% of recreational groups who do not have a license and are likely not fishing.
- At the fishing access sites, private boat fishing, private non-fishing raft trips, and exercising/dog walking were the top activities engaged in by visitors when they responded to all possible activities asked of them.
- River monitoring via intercept surveys and observations provide promising methods, that once established, do not need to be conducted every year, especially if river cameras provide use data yearly.

Executive Summary

Upper Yellowstone River Monitoring: Usage and User Characteristics

Recreational usage, both fishing and non-fishing, on Montana waterways has grown in the number of users and types of activities over the years. Already, commercial usage is monitored or managed on several Montana rivers including the Madison, Bitterroot, and Blackfoot. The purpose of this study was to conduct exploratory methods that can provide baseline data of all river users on the Upper Yellowstone River (UYR) as a pilot study and guide for future monitoring on other Montana waterways.



The majority of UYR use is from the communities near the river (Livingston, Bozeman, Emigrant).

85% have visited the UYR in the past.

73% of users have a personal fishing license or someone in their group has a license.

- 75% of Montana groups had a fishing license
- 60% of nonresident groups had a fishing license

90% or higher is the satisfaction rate at put-in, takeout, and the on-river experience.





If launching - where users take-out in order of highest take-out numbers to lowest:

- Launch at Grey Owl take out at Mallard's Rest, Loch Leven, Pine Creek, or Carter's Bridge
- Launch at Pine Creek take out at Carter's Bridge, Mayor's Landing, or Hwy89 Bridge
- Launch at Mallard's Rest take out at Carter's Bridge, Pine Creek, or Mayor's Landing

Observation Results with highest numbers

Average number of vehicles

35.26 - Mallard's Rest FAS (range = 9 to 93 vehicles) 25.59 - Emigrant FAS (range = 5 to 76 vehicles)

Average number of trailers

12.73 –Emigrant FAS (range = 1 to 39 trailers) 12.10 – Grey Owl FAS (range = 0 to 43 trailers)

Recommendations for monitoring river use

- Depend on cameras for counts on the river.
- Use road counters for a count of vehicles in and out of fishing access sites.
- Use intercept surveys for usage type for full season, then every 3-5 years to compare trends.
- Use observation methods sparingly as it is cumbersome and less reliable.
- Unless there is a dedicated coordinator to train and check on volunteers, it is imperative to hire a researcher to collect data.



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Introduction

Outdoor recreation in Montana is touted as a \$7.1 billion industry supporting 71,000 jobs by the Outdoor Industry Association.¹ According to a Bureau of Economic Analysis report, Montana is second in the nation, just behind Hawaii, in terms of the contribution of outdoor recreation activities to state gross domestic product, or GDP.²

Nonresident visitors to Montana have continuously reported that our natural resources are why they visit our state. In fact, in 2019 nine of the top 10 attractions were related to the outdoors, including: mountains and forests (63%), open space and uncrowded areas (47%), rivers (43%), Yellowstone National Park (43%), Glacier National Park (38%), wildlife (37%), lakes (33%), hiking (25%), and camping (20%).³

The importance of recreation and access to the outdoors also holds true for residents. In an Institute for Tourism and Recreation (ITRR) 2018 resident travel report, five of the top 10 activities engaged in when traveling 50 or more miles from home were related to outdoor recreation -- including scenic driving, day hiking, wildlife watching, nature photography and camping.⁴ All these activities involve public lands which explains why 94% of Montanans value Montana for its access to public lands and waterways.⁵

For Montana to maintain its position as an outdoor recreation leader, it must do more than just provide opportunity, it must also ensure that the quality of the outdoor experience is maintained amid increasing use. However, a clear understanding of the amount and type of use, the satisfaction and expectations of users, and where use occurs on our lands and waterways has yet to be systematically monitored in a standardized format. Without a baseline and continual checks on visitor use (similar to the ITRR nonresident visitor study), the very reason people visit Montana and spend money, as well as why people live in Montana, could be in jeopardy. Our public lands and outdoor recreation opportunities stand to be put at risk of overuse, resource degradation, and deterioration.

Therefore, the goal is to initiate a visitation and visitor use monitoring program to assist land and water managers across Montana with valid and reliable data for planning and management decisions. This need was articulated in the 2020-24 Statewide Comprehensive Outdoor Plan, or SCORP, which serves as Montana's five-year vision and guide for outdoor recreation management.⁶ As part of the second goal of enhancing public access to outdoor recreation resources and facilities, a key recommendation addressed in the report included developing a collaborative data collection effort to gauge statewide and regional outdoor recreation related visitor use.

As such, recreational usage of Montana waterways has grown both in the number and types of activities. Usage by anglers on individual waters has been periodically assessed by FWP since 1989, and a 2016 survey of fishing access sites was conducted to better understand user demographics and expectations. In addition, commercial usage is monitored on several rivers, including the Madison,

¹ <u>https://outdoorindustry.org/wp-content/uploads/2017/07/OIA_RecEcoState_MT.pdf</u>

² <u>https://www.bea.gov/system/files/2019-09/orsa0919_1.pdf</u>

³ <u>http://www.tourismresearchmt.org/</u>

⁴ <u>https://scholarworks.umt.edu/itrr_pubs/369/</u>

⁵ <u>https://scholarworks.umt.edu/itrr_pubs/366/</u>

⁶ <u>https://files.cfc.umt.edu/humandimensionslab/SCORP_2020-2024.pdf</u>

Blackfoot, and Bitterroot. What is known is that along some waterways, there are complaints from users saying there are too many people on the rivers, that trash along shores and in the waterways is increasing, and that use of the access sites has increased substantially. The visitor experience, both at the access sites and on the water, is likely eroding in these instances. Without systematic monitoring, we will not know the extent of this experience erosion, and managers cannot react to these changes.

Montana's economy is dependent on visitors from out-of-state to play in our backyard and on residents to stay, work, and recreate in an environment conducive to that. Our outdoor environment needs to be monitored and maintained for the future. This cannot be accomplished without baseline data and a monitoring strategy. The establishment of a monitoring protocol will allow Montana land and water managers to keep abreast of challenges and opportunities users experience during their visit to our state-run natural resources. Ultimately, by managing our resources for the benefit of residents and nonresidents, Montana will continue to be the 'Last Best Place' for outdoor recreation in the United States.

Purpose and Objectives

Purpose

The overall purpose for monitoring visitor use is to establish an understanding of the number of users in a particular land or waterway, activities a visitor engages in, and the characteristics of use in those areas as a baseline and guide for comparisons of future use. This allows for management insight on changes (good or bad) to the visitor experience and the resource so that managers can protect and manage the resources and experiences for future users.

The purpose of *this* study was to conduct exploratory methods that can provide a baseline of visitor use on the Upper Yellowstone River as the pilot study for Montana's waterways. The intent is to use this study to establish the same or comparable methods across other Montana water resources to monitor yearly trends and for forecasting future use. This study is designed to be the beginning of a periodic assessment of visitor use in Montana as it relates to public waterways.

Objectives

- To create and maintain a visitor use monitoring program of public waterways in Montana
- To begin this monitoring program on a subset of rivers in Montana
- To analyze and redesign methods of monitoring protocol
- To continue monitoring at key sites each year
- To add additional sites in future years to increase the monitoring reach, especially as use increases around the state.

Methods

Sampling

A purposive sampling method of location and times was used for this study. First, locations along the upper Yellowstone River were narrowed down to one stretch of the river from Emigrant to Mayor's Landing in Livingston. This was decided upon by Montana Fish Wildlife and Parks, the Upper Yellowstone Watershed Group, and the Institute for Tourism and Recreation Research because of budgetary

restraints and volunteer availability. Second, the specific stretch selected from Emigrant to Mayor's Landing was picked as the pilot area due to the increased use this river stretch has been experiencing lately.

As shown in Figure 1, eight fishing access sites (underlined in red) plus an additional site called Mill Creek (located on the east side of the river between Grey Owl and Baileys/Paradise FAS) and one private property (red X) were used for observations and intercept surveys. Four sites per day, each with a twohour data collection time period were conducted from July 1, 2020 through September 9, 2020. Times and days at each FAS were varied throughout the summer to represent both week days and weekends, mornings and afternoons.





For this study, the stretch from Emigrant to Mayor's Landing and the

corresponding Fishing Access Sites (FAS) with the red underline were the focus of data collection.

The red X below Emigrant is a private property location. The volunteer counted crafts floating down the river to get a sense of the use upstream from Emigrant which was moving into the river stretch of interest for this study.

Data collection

mmoth Hot Springs

Point of Rocks

Slip-and-Slide

Brogan's Landing

Gardine

Queen of the Waters

Crystal Cross

n Miner

Vankee lin

Canyon

Racin

Three distinct data collection methods were used for this study:

- 1) Observation and recording of on-going activity at the fishing access sites;
- Intercept surveys of recreationists at the fishing access sites, and;
- Trail cameras located on private property situated in appropriate spots to capture photos of watercraft floating by.

The detail of these three methods are described as follows:

Observations

- A. <u>Initial Observation</u> Randomly sampled observation times at eight Fishing Access Sites (FAS) were conducted by the researchers. Upon arrival at the FAS, the researcher recorded basic information including number of vehicles, trailers, adults and children present, weather conditions, number of vehicles lined up to launch, and visitor activity, e.g. number of people swimming/wading/beaching, camping, picnicking, wade fishing, bank fishing, dog walking/exercising, bird watching/nature observation, and just hanging out. Data was collected on paper then input into a Qualtrics survey at the end of each day.
- B. <u>River observation</u> After the initial count and intercept survey of all visitors at the FAS, the researcher located her/himself at a spot at the FAS where the river could be observed for passing watercraft, launching of craft, or taking out of watercraft. Counts included type and number of fishing water craft, type and number of non-fishing water craft. Counts of people on each type of craft, and an attempt to see if the craft was a commercial fishing craft or private.
- C. <u>Final observation</u> after 2 hours, the researcher repeated the observations listed in A above and then moved to the next FAS for another 2-hour data collection period.

Intercept survey

A. <u>Visitor surveys</u> – Upon completion of the observations recorded at arrival at the FAS, the researcher intercepted people at the FAS and conducted an on-site interview that asked about: purpose of being at the FAS; activities engaged in at the site; group type; fishing license; and some demographics. Data was collected on a tablet and uploaded at the end of each day.

Trail cameras

A. <u>Camera images</u> – five cameras were located at strategic spots along the river with approval from the property owners. These cameras took photos which are being calibrated with hand-recorded observations made by ITRR staff during a three-day period. This data process was used to verify the images on the cameras. The data will be managed to assist with the decision of what type of camera is best for clarity and validity for future monitoring studies. A machine recognition program will be designed such that the camera data can easily record accurate numbers of watercraft and people on Montana rivers.

This report contains the results of the observations and the intercept survey only. The trail camera verification and use will be provided in a separate report.

Survey design

Both the intercept survey and the observation form were designed jointly by ITRR, FWP fisheries division, and the Upper Yellowstone Watershed Group.

The intercept survey was designed to elicit as much open ended/free form responses as possible. To that end, the experience sections on the put-in, take-out, and on-river were created by all three partners of this study brainstorming the possible answers recreationists might provide. This list of possible answers was written on the questionnaire so the surveyor could quickly check them off. In addition, an 'other' was provided so the surveyor could write them down. The intent was to make the respondent think about their experience without prompts from the surveyor. This was done so as to not

sway them into simply agreeing with a statement because it may have been a part of their experience, but not necessarily top of mind. All of their responses were top of mind in this study, free of prompts or suggestions from the surveyor. The full intercept survey is found in Appendix A.

The observation form was also designed by the same group, tested on site, revamped and can be found in Appendix B. This form was used at the fishing access sites during the researcher's 2-hour shift each day. Four sites were completed each day, five days a week from July 1 through September 9, 2020.

Limitations

This study was limited to one paid surveyor for data collection and observation. While a few volunteers initially agreed to assist in the project, that assistance did not come to fruition.

Limitations also include a summer in which impacts and reactions to COVID-19 may have increased or decreased certain users and use types on the Upper Yellowstone River.

Finally, for the observation data collected, this study was limited to observations conducted at the beginning and end of a 2-hour shift. These are 'moments in time' and may bias the actual full-day activities at any of the fishing access sites.

Response rate

Responses to the intercept survey were approximately 95% of all intercepts. A full and accurate account was not formally recorded and is based on the surveyor's observation of how many recreationists may have declined.

Results

This section will start with intercept survey results for the entire river reach between Emigrant and Mayor's Landing followed by data tables and results comparing each fishing access site. This allows for a complete picture of activities and counts in-total and then a view per fishing access site. Our researcher surveyed at the following fishing access sites: Mayor's Landing, Carter's Bridge, Grey Owl, Mallard's Rest, Pine Creek, Loch Leven, Emigrant, Dan Baileys/Paradise, and Mill Creek/Pray Bridge.

Observation results follow the intercept survey results.

Intercept Survey Results: All FASs surveyed on this river stretch

In total, 1,036 individuals responded to the intercept survey. Table 1 shows the number of surveys completed for each of the nine FAS sites.



Fishing Access Site	Frequency	Percent of total
Mayor's Landing	189	18%
Carter's Bridge	159	15%
Grey Owl	129	13%
Mallard's Rest	127	12%
Pine Creek	119	12%
Loch Leven	109	11%
Emigrant	105	10%
Bailey's Paradise	49	5%
Mill Creek	45	4%
Total	1,031*	100%

Table 1: Respondents per fishing access site



*Five site names were not recorded

Overall Demographics and Recreationists' Characteristics

Forty-four percent of respondents (n=452) were female and 55% were male (n=572). Ages ranged from 19 to 88 with an average age of 45.71.

When looking at recreationists on this river stretch, it is apparent that the majority (81%) are from Montana and 19% are out-of-state visitors (Figure 2). A further look at just the 81% who are Montana recreationists is as follows: 44% from Livingston; 41% from Bozeman/Belgrade/Gallatin Gateway; 4% from Emigrant; and 9% from elsewhere in Montana stretching from all corners of the state.





* Bozeman area includes Bozeman, Belgrade, & Gallatin Gateway

The average number of adults per group was 2.98 with a range from 1 to 40. The average number of children per group was 2.24 with a range from 0 to 10.

The group type was fairly even across the five types (Figure 3), but groups of 'just friends' was the most prominent with nearly ¼ of the total group types, followed by family groups and couples.

Figure 3: Type of Recreational Group





By and large, recreationists at the FASs were repeat visitors to the Upper Yellowstone River (85% of respondents) with an average number of visits to the river of 45.6 days in 2019. This ranged from zero to 500 visits in 2019. The large numbers can be described as people who live near a FAS and use it as a walking or dog walking area one to two times a day.

Fifty-three percent of recreationists interviewed indicated they had a current fishing license. In total, 73% of groups at the FAS have at least one fishing license amongst them. Further detail shows: **Montana residents**

- 54% of respondents who were Montanan's had a fishing license
- 75% of the Montanan groups had at least one license within the group
 25% of Montana groups did not have a fishing license
- 35% of the Montana groups intercepted said fishing was their main activity **Nonresidents**
 - 50% of respondents who were nonresidents had a fishing license
 - 60% of the nonresident groups had at least one license within the group
 40% of nonresident groups did not have a fishing license
 - 37% of the nonresident groups intercepted said fishing was their main activity

Overall, 27% of recreational groups did not have a license. However, looking further at the types of activities engaged in by FAS recreationists, 60% of the groups' main recreation activities did not include fishing and yet, many still had a license to fish.

At the fishing access sites, private boat fishing, private non-fishing raft trips, and exercising/dog walking were the top activities engaged in by visitors when they could select from all the activities listed for them. Figure 4 provides the full set of activities and Figure 5 shows their primary (main purpose) activity that day. Fishing makes up 40% of all activities at fishing access sites.

Figure 4: Percent of respondents who engaged in activities at fishing access sites



*Dog walking primarily at Mayor's Landing and Carter's Bridge



Figure 5: Primary Activity

*Dog walking primarily at Mayor's Landing and Carter's Bridge

Finally, recreationists were asked about their overall satisfaction at the put-in, on the river, and/or at the take out. Overwhelmingly, respondents were very satisfied throughout the river stretch. There was no difference by fishing access site, therefore overall river satisfaction is provided in Figure 6.



Figure 6: Overall On-river, Put-in, and Take-out Satisfaction

Note: one person said very unsatisfied at the put-in, take-out, and on-river; two people said unsatisfied at put-in.

Satisfaction with On-River Experience

River users were asked to explain their satisfaction or dissatisfaction by being asked: "What was satisfactory about your on-river experience" (Table 2) and "What was unsatisfactory about your on-river experience" (Table 3). Being on the water, time with family or friends, and success fishing represent three-fourths of all comments.

Table 2: Unaided answers to satisfaction with their on-river experience

N=1,036 (n=385 for this question)		Frequency	Percent
Being on the water		103	27%
Time with family/friends		91	24%
Caught fish/good fishing		89	23%
Natural surrounding/scenery		51	13%
Relaxing		33	9%
Wildlife		7	2%
Solitude		4	1%
Learning to fish/row/kayak, etc.		4	1%
Beats work		2	1%
Other – Few people		1	<1%
	Total	385	100%

The majority of recreationist (89%) said there was nothing bad about their experience on the Yellowstone while 5% indicated there were too many people on the river.

Table 3: Unaided answers to what was less than satisfactory about their on-river experience

Frequency	Percent
192	89%
10	5%
7	3%
1	<1%
1	<1%
5	20/
	Ζ70
216	100%
	Frequency 192 10 7 1 1 5 5



Fishing Access Sites Data Results

Figure 7 highlights recreationists' answer to the question, "Are you launching, taking out, or recreating at the site today?" If launching, the surveyor asked where they planned to take out. Those take-out numbers were added in to the take-out data of people intercepted while taking out.

Each FAS is used for all three activities of launching, take-out, or recreating on-site except for Bailey's/Paradise which is primarily used for on-site recreation due to a lack of a boat ramp. Grey Owl (31%) receives the majority of launching. Carter's Bridge, Mallard's Rest, and Pine Creek represent 64% of all take-outs. Mayor's landing plus Carter's Bridge receive about half of all on-site recreation.



Figure 7: Percentage of Launch, Take-out, and Recreating on-site at each FAS





Data in Table 4 shows launch, take-out, and recreating on-site by where the surveyor was intercepting visitors.

	INTERCEPT	ED when LAUNCHING	INTERCEP	SITE REC.	
	%		% Taking		% Recreating
Intercepted at:	Launching	Where will you take out?	out	Where did you launch?	at FAS
Mayor's Landing	16% (30)	Other (18); Hwy 89 bridge (7);	16% (31)	Carter's Bridge (14); Pine Creek (13);	67% (126)
(n=189)		Springdale Bridge (2);		Emigrant (2); Mallard's Rest (1)	
Carter's Bridge	28% (44)	Mayor's Landing (34)	26% (42)	Mallard's Rest (15); Pine creek (11); Loch	45% (71)
(n=159)		Hwy 89 bridge (8)		Leven (8); Grey Owl (2);	
				Pt. of Rocks (1)	
Grey Owl	85% (109)	Mallard's Rest (76); Loch Leven (16);	5% (7)	Emigrant (4);	10% (13)
(n=129)		Pine Creek (12); Carter's Bridge (3); Mill Creek (1)		Point of Rocks (3)	
Mallard's Rest	36% (46)	Carter's Bridge (39); Pine Creek (4);	28% (35)	Grey Owl (24); Mill Creek (3);	35% (44)
(n=127)		Mayor's Landing (2)		Emigrant (3); Chicory (1)	
Pine Creek	48% (57)	Carter's Bridge (32); Mayor's	37% (44)	Loch Leven (16); Grey Owl (9);	13% (15)
(n=119)		Landing (18); Hwy89 Bridge (1)		Mill Creek (8); Mallard's rest (4);	
				Carbella (1); Chicory (1);	
				Baileys/Paradise (1); Emigrant (1)	
Loch Leven	39% (43)	Carter's Bridge (25); Pine Creek (15);	26% (28)	Grey Owl (19); Emigrant (6);	34% (37)
(n=109)		Mayor's Landing (3)		Chicory (2); Mill Creek (1)	
Emigrant	35% (37)	Loch Leven (16); Mallard's Rest (7);	31% (32)	Pt. of Rocks (25); Carbella (4); Joe Brown	34% (36)
(n=105)		Mill Creek (4); Grey Owl (3);		(1); private property (1)	
		Chicory (2); Carter's Bridge (1)			
Bailey's Paradise	6% (3)	Mallard's Rest (1); Pine Creek (1);	2% (1)	Grey Owl (1)	92% (45)
(n=49)		Carter's Bridge (1)			
Mill Creek	56% (25)	Pine Creek (21); Carter's Bridge (2);	9% (4)	Emigrant (3); Grey Owl (1)	33% (15)
(n=45)		Mallard's Rest (1)			

Table 4: FAS Site data of numbers Launching, Taking Out, and Recreating at the Site

The top four primary activities experienced by recreationists at each FAS are highlighted in Table 5. Loch Leven and Mallard's Rest share the same top 4 activities, perhaps because they are both camping areas with good boat ramps. Otherwise, all the other FASs have unique primary activities. Exercising and dog walking show up at Mayor's Landing and Carter's Bridge. Private boat fishing is a top activity in all but one of the sites. Carter's Bridge, Bailey's/Paradise, and Mill Creek were favored for wade fishing. Swimming was only a top four activity at Emigrant FAS.

Primary Activity at FAS - top 4 are highlighted per FAS	Mayor's Landing	Carter's Bridge	Grey Owl	Mallard's Rest	Pine Creek	Loch Leven	Emigrant	Bailey's/ Paradise	Mill Creek
Guide boat fishing	<mark>8% (15)</mark>	8% (12)	<mark>10% (13)</mark>	11% (13)	<mark>16% (19)</mark>	6% (6)	9% (9)		7% (3)
Private boat fishing	<mark>12% (23)</mark>	<mark>21% (32)</mark>	<mark>31% (40)</mark>	<mark>14% (17)</mark>	<mark>35% (41)</mark>	<mark>25% (27)</mark>	<mark>20% (21)</mark>		<mark>24% (11)</mark>
Wade fishing	1% (2)	<mark>13% (19)</mark>	4% (5)	5% (6)	4% (5)	3% (3)	10% (10)	<mark>13% (6)</mark>	<mark>24% (11)</mark>
Guided non-fishing raft trip	1% (2)	<1% (1)	2% (2)	1% (1)	1% (1)				
Private non-fishing raft trip	<mark>9% (17)</mark>	<mark>19% (29)</mark>	<mark>27% (35)</mark>	<mark>24% (30)</mark>	<mark>19% (22)</mark>	<mark>19% (21)</mark>	<mark>21% (22)</mark>	2% (1)	13% (6)
Kayaking, canoeing, paddle boarding	2% (3)	5% (8)	<mark>14% (18)</mark>	<mark>13% (16)</mark>	<mark>14% (16)</mark>	<mark>14% (15)</mark>	<mark>14% (15)</mark>	6% (3)	<mark>20% (9)</mark>
Tubing	1% (1)	1% (2)	6% (8)	2% (3)	2% (2)	1% (1)	1% (1)	2% (1)	2% (1)
Swimming	3% (6)	7% (11)	2% (2)	3% (4)	2% (2)	1% (1)	<mark>14% (14)</mark>	2% (1)	2% (1)
Camping		<1% (1)		<mark>19% (23)</mark>	1% (1)	<mark>19% (20)</mark>		<mark>63% (30)</mark>	
Picnicking	3% (5)	8% (12)	2% (2)	2% (3)		2% (2)	5% (5)	4% (2)	
Exercise/ dog walking	<mark>59%</mark> (110)	<mark>13% (20)</mark>	2% (2)	3% (4)	4% (5)	8% (9)	5% (5)	6% (3)	2% (1)
Birding/ nature observing	1% (1)	2% (3)	2% (2)	2% (2)		2% (2)	2% (2)	2% (1)	4% (2)
Other	1% (1)	<1% (1)		2% (2)		1% (1)			

Table 5: Primary Activities at Fishing Access Sites

Recreationist were asked their satisfaction at launch areas and take out areas. Table 6 shows the unaided answers said by respondents. There was no list to choose from. By far, the most stated satisfaction response was that the boat ramps were in good condition. Specific satisfaction in the 'other' response highlight good things at the site such as large ramp and parking areas (Table 7).

NUMBER of people satisfied with <i>put-in</i> <i>experience</i>	Mayor's Landing (n=27)	Carter's Bridge (n=42)	Grey Owl (n=96)	Mallard's Rest (n=42)	Pine Creek (n=50)	Loch Leven (n=41)	Emigrant (n=32)	Bailey's Paradise (n=3)	Mill Creek (n=22)
It was quick	3	2	13	4	7	2	5		3
Few people there	3	5	8	4	13	11	2	3	22
Lots of people there	1		1						
Clean restrooms	3	6	14	4	6	1	3		
No restroom lines									
Campsites in good condition	2	2	3	1		1	1		1
Boat ramps good condition	22	24	60	25	26	23	16		
Parking	5		10	5	5	8	1	3	
Other*	4	12	33	18	12	7	11		2

Table 6: Unaided satisfaction answers for the launch (put-in) experience by fishing access sites

*'Other' descriptions are in Table 7

Table 7: 'Other' satisfaction answers for the launch (put-in) experience by fishing access sites

FAS	Comments
Mayor's Landing	Clean site (1); Right in town (1)
Carter's Bridge	Clean site; large boat ramp (9); well kept
Grey Owl	Circular ramp set up (9); clean (18); good boat ramp etiquette (1); large ramp (2); parking separate from ramp (2)
Mallard's Rest	Circular ramp (1); Clean site (7); large ramp area (8); ramp set-up/easy line-up (1)
Pine Creek	Clean site (7); lots of parking space (1); well kept (1)
Loch Leven	Clean site (5); good ramp set-up (1)
Emigrant	2 boat ramps (4); clean site (1); large ramp area (1); room to unload rafts/fill tubes (1); space to setup rafts (1)
Bailey's/Paradise	No comments recorded
Mill Creek	No comments recorded

Table 8: Unaided dissatisfaction answers for the launch (put-in) experience by fishing access sites

Number of people dissatisfied	Mayor's	Carter's		Mallard's	Pine	Loch		Bailey's	
with put-in experience	Landing	Bridge	Grey Owl	Rest	Creek	Leven	Emigrant	Paradise	Mill Creek
	(n=29)	(n=44)	(n=108)	(n=46)	(n=57)	(n=43)	(n=37)	(n=3)	(n=25)
Delayed at put-in	1		1						
Obnoxious/loud people			1	1					1
Dirty restrooms		4	1				1		
Poor campsite conditions									
Poor ramp conditions			1					16	
Litter/garbage			1		1				
Conflicts with other users									1
Parking	2	13	24	2	7		15		4
Nothing	24	25	67	35	30	37	19	3	3
Too many people	2	3	12	2	7	2	4		
Need more picnic tables					1	1			
No restroom hand sanitizer	1		3	1	1				
Other*	2	1	6	5	9	3	1		2

*Other comments listed in Table 9

Table 9: 'Other' dissatisfied answers for the launch (put-in) experience by fishing access sites

FAS	Comments
Mayor's Landing	Lots of glass (2)
Carter's Bridge	Parking lot can get congested (1)
Grey Owl	Need better parking & ramp set up (1); boat ramp etiquette problems (3); no trash can (1); parking can be a mess (3)
Mallard's Rest	More toilet paper (2); no more access to lookout (1); people getting boats ready on ramp (1)
Pine Creek	Boat ramp setup can get clogged (1); concrete bars in boat ramp (1); more boat ramp space (2); more site maintenance
	(1); no trash can (2); no parking on busy days (1); One-way signs (1); rocks make it hard to take out here (1);
Loch Leven	Boat ramp etiquette (1); more toilet paper (1)
Emigrant	Would like to see gravel bar at ramp (1)
Bailey's/Paradise	No comments recorded
Mill Creek	No restroom (2);

Table 10: Unaided satisfaction answers for the take-out experience at fishing access sites

Satisfaction with take-out experience	Mayor's Landing (n=31)	Carter's Bridge (n=42)	Grey Owl (n=7)	Mallard's Rest (n=35)	Pine Creek (n=44)	Loch Leven (n=28)	Emigrant (n=32)	Bailey's Paradise (n=1)	Mill Creek (n=4)
It was quick	3	3	1	4	5	7	5		1
Few people there	1	1	2	5	6	6	1	1	2
Lots of people there									1
Clean restrooms	4	7		7	6		3		
No restroom lines		1							
Campsites in good condition	5		1	2		2		1	
Boat ramps good condition	28	21	4	22	27	15	14		
Parking	1				1	3	2		
Other*	2	8	1	7	5	3	13		

*Other comments listed in Table 11

Table 11: "Other" Satisfaction answers for the take-out experience at fishing access sites

FAS	Comments
Mayor's Landing	Clean site (1); Lots of space for unloading boats (1)
Carter's Bridge	Large ramp area (5); lean site (1); lots of space for boats to pull aside (1)
Grey Owl	Clean site (1)
Mallard's Rest	Large ramp space (6)
Pine Creek	Clean site (1); nothing (1)
Loch Leven	Clean site (2); easy to find (1)
Emigrant	2 boat ramps (5); clean site (3); big ramp area (3); easy to find from river (2)
Bailey's/Paradise	No comments recorded
Mill Creek	No comments recorded

Table 12: Unaided dissatisfaction answers for the take-out experience at fishing access sites

Number of people dissatisfied with <i>take-out experience</i>	Mayor's Landing (n=31)	Carter's Bridge (n=42)	Grey Owl (n=7)	Mallard's Rest (n=35)	Pine Creek (n=57)	Loch Leven (n=28)	Emigrant (n=32)	Bailey's Paradise (n=1)	Mill Creek (n=4)
Obnoxious/loud people	1					1			
Dirty restrooms		2	2						
Poor campsite conditions									
Poor ramp conditions						1			3
Litter/garbage		2				1			
Parking	1	9		0	3	3	6		
Too many people	1	4	7	2	6		3		
Nothing	24	25	4	29	27	21	21	1	1
No restroom hand sanitizer				3		1			
Other*	4				8	1			

*other comments listed in Table 13

Table 13: "Other" dissatisfaction answers for the take-out experience at fishing access sites

FAS	Comments
Mayor's Landing	Can get very busy (1); glass coming through landfill (1); no trash cans (2)
Carter's Bridge	No comments
Grey Owl	No comments
Mallard's Rest	No comments
Pine Creek	Not a lot of ramp space (2); one-way signs needed (2); too many rocks at bottom of ramp (1)
Loch Leven	Current at Loch Leven make this a dangerous put-in
Emigrant	No comments
Bailey's/Paradise	No comments
Mill Creek	No comments

Fishing Access Site Observation Data

Upon arrival at each FAS, our surveyor recorded the weather conditions, the number of people, boat trailers, vehicles, activities people were involved in, and activity passing by on the river. In total, 336 observations were made (one at the beginning and end of each 2-hour shift). See Table 14 for the number of times our researcher was at each site (shown in the heading after the name of each FAS).

The following provides a synopsis of just some of the data for comparison purposes. Full data per FAS can be found in Appendix C.

In these 'moment in time' recordings, Mallard's Rest FAS had the highest average of vehicles while Emigrant FAS had the highest average of trailers. Loch Leven FAS had both the highest average number of adults and children (Table 14).

	Mayor's	Carter's		Mallard's				Bailey's	
Observations	Landing	Bridge	Grey Owl	Rest	Pine Creek	Loch Leven	Emigrant	Paradise	Mill Creek
	(n=19)	(n=23)	(n=20)	(n=19)	(n=19)	(n=17)	(n=15)	(n=16)	(n=20)
End of shift average #	16.53	24.7	18.25	35.26	18.37	25.59	27.6	3.88	3.47
& range of vehicles	2-32	2-26	0-69	9-93	3-52	4-51	5-76	0-7	0-12
End of shift average #	6.00	9.39	12.10	12.05	9.32	8.82	12.73	0.13	1.21
& range of trailers	0-16	0-25	0-43	3-30	2-27	1-19	1-39	0-1	0-5
End of shift average #	4.56	6.04	4.30	7.58	3.32	8.29	5.87	2.81	0.53
& range of adults	0-9	0-21	0-12	0-28	0-15	0-27	0-13	0-8	0-2
End of shift average #	0.24	1.05	0.68	1.89	0.67	2.41	1.27	0.25	0
& range of children	0-2	0-7	0-8	0-9	0-4	0-8	0-3	0-2	0
Most common activity	Dog	Hanging	Hanging	Camping	Hanging out	Camping	Swimming	camping	Shore/
	walking/	out	out						Wade
	exercise								risning

Table 14: Observations at FAS – vehicles, trailers, people, and most common activity observed

The next three tables (Tables 15-17) provide FAS specific data on the number of crafts and people at a site divided by whether those people were fishing or not based on observational data. At the bottom of each table is the percent of people fishing vs non-fishing. These observations should be compared with the survey data since observations are simply a 'moment in time' and may not reflect the overall activities engaged in at the sites. For example, the observations at Mayor's Landing indicate it is all fishing activity whereas the intercept survey data shows it's more a place for exercise and dog walking.

Table 15: Observation at Mayor's Landing, Carter's Bridge, & Grey Owl

Mayor's Land	ling			Carter's Bridge				Grey Owl		
Fishing	Fishing Crafts	Fishing People		Fishing	Fishing Crafts	Fishing People		Fishing	Fishing Crafts	Fishing People
Launching	4	12		Launching	7	17		Launching	6	18
Passing by	0	0		Passing by	5	13		Passing by	18	53
Taking out	0	0	ļ	Taking out	12	41		Taking out	0	0
Non-fishing	Non- fishing Crafts	Non- fishing People		Non- fishing	Non- fishing Crafts	Non- fishing People		Non-fishing	Non- fishing Crafts	Non- fishing People
Launching	0	0		Launching	19	41		Launching	10	14
Passing by	0	0		Passing by	6	19		Passing by	18	64
Taking out	0	0		Taking out	15	28		Taking out	0	0
Activity at FAS site (Launch & takeout)			Activity	at FAS site (La takeout)	unch &		Activity at FAS	S site (Launch	& takeout)	
People	Frequency	Percent		People	Frequency	Percent		People	Frequency	Percent
Fishing	12	100%	ļ	Fishing	58	46%		Fishing	18	56%
Non-fishing	0	0%		Non-fishing	69	54%		Non-fishing	14	44%
TOTAL	12			TOTAL	127			TOTAL	32	

Table 16: Observations at Mallard's Rest, Pine Creek, & Loch Leven

Mallard's Rest	t		Pine Creek				Loch Leven			
Fishing	Fishing Crafts	Fishing People	Fishing	Fishing Crafts	Fishing People		Fishing	Fishing Crafts	Fishing People	
Launching	7	18	Launching	18	57		Launching	22	55	
Passing by	11	27	Passing by	5	10		Passing by	32	88	
Taking out	17	44	Taking out	15	37		Taking out	15	41	
Non-fishing	Non- fishing Crafts	Non-fishing People	Non- fishing	Non- fishing Crafts	Non- fishing People		Non- fishing	Non- fishing Crafts	Non-fishing People	
Launching	11	34	Launching	1	3		Launching	0	0	
Passing by	19	41	Passing by	30	63		Passing by	17	40	
Taking out	40	73	Taking out	14	40		Taking out	20	25	
Activity at FAS site (Launch & takeout)		Activity at FA	AS site (Launc	h & takeout)		Activity at F	AS site (Laun	ch & takeout)		
People	Frequency	Percent	People	Frequency	Percent		People	Frequency	Percent	
Fishing	62	37%	Fishing	94	69%		Fishing	96	79%	
Non-fishing	107	63%	Non-fishing	43	31%		Non-fishing	25	21%	
TOTAL	169		TOTAL	137			TOTAL	121		

Table 17: Observations at Emigrant, Bailey's/Paradise, & Mill Creek

Emigrant			Bailey's/Para	dise		Mill Creek		
Fishing	Fishing Crafts	Fishing People	Fishing	Fishing Crafts	Fishing People	Fishing	Fishing Crafts	Fishing People
Launching	1	4	Launching	8	19	Launching	7	20
Passing by	9	25	Passing by	59	179	Passing by	125	350
Taking out	0	0	Taking out	0	0	Taking out	4	8
Non-fishing	Non- fishing Crafts	Non- fishing People	Non-fishing	Non- fishing Crafts	Non-fishing People	Non-fishing	Non- fishing Crafts	Non- fishing People
Launching	8	16	Launching	1	1	Launching	15	26
Passing by	2	6	Passing by	122	237	Passing by	251	489
Taking out	0	0	Taking out	0	0	Taking out	3	4
Activity at FAS	site (Launch &	k takeout)	Activity at FA	AS site (Launc	h & takeout)	Activity	at FAS site (La takeout)	unch &
People	Frequency	Percent	People	Frequency	Percent	People	Frequency	Percent
Fishing	4	20%	Fishing	19	95%	Fishing	28	48%
Non-fishing	16	80%	Non-fishing	1	5%	Non-fishing	30	52%
TOTAL	20		TOTAL	20		TOTAL	58	

Conclusions and Recommendations

This study was conducted to create a baseline of data to assist in a future monitoring of activity, including numbers of users and types of activities engaged in on the upper Yellowstone River and at fishing access sites. The 30-mile stretch studied started at Emigrant FAS and continued to Mayor's Landing FAS in Livingston.

As stated on a Yellowstone River access map:

"Carbella to Livingston is the most heavily used stretch on the Yellowstone River. The relative ease of floating, numerous access points and world class fishing make this one of the most popular runs in the state."



This study provides an understanding of how people use the fishing access sites, their satisfaction at the sites, and their 'on-the-river' experience, as a starting point for river monitoring. Furthermore, a continuation of this project will be an analysis of river camera data that captured the number of people passing by on the river during the day. Camera data will eventually be the best on-going monitoring of numbers of people. Periodic FAS intercept studies could update the type of use and satisfaction levels at each site.

The exploratory aspect of the intercept survey used free form questioning related to experience and satisfaction (not forced choice, a list of choices, or Likert scales). A problem with this type of survey is that the respondent generally is not able to think, on the spot, of all the possible issues that have come up. Because of that, low responses were recorded for most experience and satisfaction questions and these cannot be compared against each other at the surveyed sites.

Lessons Learned and Recommendations

- 1. Intercept survey data is the best method to determine the activities being engaged in at the fishing access sites. The observation data collected was a 'moment in time' and not always representative of full activities at the site.
 - a. Survey design should stay away from 'free form' and be designed to ask the recreationist to answer all the questions. This allows for comparison between sites and over time.
 - b. It is recommended that the surveys be recorded on a tablet to avoid data entry error. This study used iForm to create the survey and was input on site. It worked just fine, but any type of survey program that can be collected off-line and updated once wifi is available is suggested.
 - c. On future rivers, we recommend that initial intercept surveys cover all FASs within the river section of interest to create a baseline. Subsequent surveys can be decreased to a

small sampling throughout the stretch periodically through time based on river managers' (FAS managers) observations of changes occurring and compared to baseline data.

- 2. The use of 2-hour observations and recording at each FAS did not provide as reliable data as we had hoped for in this study. We recommend either not doing in-person observations at all or changing the methods.
 - a. First, we tried to 'see' if the river traffic was commercially guided or a private group. In most cases, it was nearly impossible to see the commercial sticker on a raft or drift boat and therefore nearly all observations were recorded as private. While we were able to achieve a type of count of commercial trips via the intercept survey, if commercial numbers compared to private group numbers are needed, a different method needs to be designed.
 - b. Second, the observation time slots were scattered throughout the day at each FAS and not enough were conducted in any one particular time slot. In almost all types of studies, it is desirable and many times required, to randomly sample sites and people so that generalizations can be made. That is what we did in this study. In hindsight, since understanding the challenges and concerns that might be occurring at each FAS was of interest, it is recommended that most data collection at an FAS be conducted during high use times. This provides managers with a better sense of recreationists' concerns at the height of use.
- 3. The camera data on the river has not been analyzed at the time of this writing. We believe cameras are the best source for estimating usage on the river. Various cameras should be tested for accuracy and reliability, and the best one needs to be used on all the rivers that are being monitored. This is not an area to skimp on the budget.
- 4. Traffic counters at each FAS would be an excellent addition to understanding usage on and near the river. We recommend that counters be placed in all or a select number of fishing access sites. If budgetary constraints exist (as they usually do), counters can be moved from one FAS to another throughout the season to start getting baseline data for each FAS. However, this does require personnel move counters which may not be a good use of the person's time.

Final Thoughts on Monitoring Methods based on this Study

- Depend on cameras for counts on the river.
- Use road counters for a count of vehicles in and out of fishing access sites.
- Use intercept surveys for usage type.
- Observation data is cumbersome and less reliable since it reflects only a static moment. Use this method sparingly.
- Volunteers are less dependable in these types of research studies since they usually have to work alone. Unless there is a dedicated volunteer coordinator who checks up on and trains them, it is imperative to hire a researcher to collect data. Depending on volunteers will likely result in incomplete data.
- Once baseline data is collected at the FAS through intercept surveys, data collection can be done every 3-5 years instead of each year.
- River/trail cameras and traffic counters should be used every year to understand use trends (numbers) for the river.

Appendix A: Intercept Survey instrument

Upper Yellowstone Visitor Use Survey REVISED 6-30-20

Hello, my name is _____ with the FWP/ITRR/UYWG (choose 1), who is partnering with FWP/ITRR/UYWG (name other 2) to conduct a recreational use study on the river.

May I ask you a series of quick questions? If no

It should only take 3 minutes of your time and your participation is completely voluntary. All information collected will be compiled into a statistical database; therefore, no personal information will be retained. Thank you!

NOTE: Surveyors will have laminated copy of questions and a map of the river with all access sites labeled.

Note: Surveyor will record which FAS the interview is taking place from a pull-down menu.

1. I'm going to list off a number of activities and just tell me which ones you (and your group) are participating in today. (mark all that apply)

Activities	participate
Guided Boat fishing	
Private group Boat fishing	
Wade fishing	
Guided non-fishing raft trip	
Private group non-fishing raft trip	
Kayaking, canoeing, paddle boarding	
Tubing	
Swimming	
Camping (at this site)	
Picnicking (at this site)	
Exercise/dog walking (at this site)	
Birding/nature observation (at this site)	
Other	

- 2. Which one was your primary activity (main purpose for being here)? Drop down box of all activities they listed above.
- 3. How many people are in your group today (including yourself)?

Adult (18 and older)	
Children	

4. How would you describe your group?

	, , ,			
Self	Couple	Just Family	Family &	Just Friends
			Friends	

5. Is this your first visit to the Upper Yellowstone River (Gardiner- Hwy 89)

Yes No

If no, about how many times did you recreate on the Upper Yellowstone last year?

6. Are you launching, taking out, or just recreating at this access site?

Launching	Survey goes to #7, then #1	.1
Taking out	Survey goes to #8	
Recreating at site	Survey goes to #9	

7. Where do you plan to take out?

FAS (select from list)	
Private property	
Don't know	

Planned take out:

Carter's Bridge (mile 58.5)
Chicory (Mile 36)
Grey Bear
Grey Owl (Mile 36)
Loch Leven Camp&Picnic (Mile44.4)
Mallard's Rest (Mile 47.3)
Mayor's Landing (Mile 64.7)
Mill Creek/Pray Bridge (Mile 40)
Baileys/Paradise (Mile 40.3)
Pine Creek (Mile 50.7)
Sheep Mountain
Springdale Bridge
Highway 89 Bridge
Other

8. Where did you launch? (if they were taking out)

FAS (select from list)	
Private property	
Don't know	

Ask Launch site

Town access (mile 0)		Point of Rocks/Hookum (mile 21.6)		Dan Bailey/Paradise (mile 40.3)		
Queen of the Waters (mile 2.2)		Point of Rocks MDT (mile 22.5)		Loch Leven (mile 44.4)		
McConnell Landing (mile 3.5)		26 Mile (mile 27.2)		Loch Leven Picnic (mile 45.5)		
Brogran's Landing (mile 7.4)		Emigrant Rest Area (mile 25.2)		Mallard's Rest (mile 47.3)		
Cinnabar/Corwin Sprs. (mile 8)		Emigrant (mile 33.5)		Pine Creek (mile 50.7)		
Slip & Slide (mile 12.9)		Emigrant West (mile 34.1)		Mouth of DePuys (mile 57.5)		
Joe Brown (mile 13.7)		Grey Owl (mile 36)		Carter's Bridge (mile 58.5)		
Crystal Cross (mile 17.5)		Chicory (mile 36)		Free River (mile 58)		
Carbella (mile 18)		Mill Creek/Pray Bridge (mile 40)		Mayor's Landing (mile 64.7)		
PRIVATE PROPERTY/OTHER (describe):						

Other than weather...

How would you rate your experience at the *put-in*? Very satisfactory satisfied dissatisfied very unsatisfied

What was satisfactory (good) about your put-in? (Check all that apply)

- It was quick
- Few people there
- Lots of people there
- Clean restrooms
- No line at the restroom
- Campsites in good condition
- Good condition of boat ramp
- Parking
- Other
 - (specify)____

What was less than satisfactory about your put-in? (Check all that apply)

- Delayed at put in
- Obnoxious/loud behavior by others
- Dirty restrooms
- Poor condition of roads at FAS
- Poor condition of campsites at FAS
- Poor condition of boat ramps at FAS
- Other (specify)

Other than weather...

How would you rate your experience *on the river*?

Very satisfactory satisfied dissatisfied very unsatisfied

What was satisfactory (good) about your experience on the river? (Check all that apply)

- Time with family/friends
- Being on the water
- Solitude
- Natural surroundings/scenery
- Wildlife
- Learning to fish/row/kayak/etc.
- Caught fish/good fishing
- Beats work
- Relaxing
- Other
 - (specify)_

What was less than satisfactory about your experience on the river? (Check all that apply)

- Too long a day/boring
- Didn't know what I/we were getting into
- Poor guide
- Didn't catch fish
- Too many people on the water
- Obnoxious/loud behavior by others
- Flow conditions of river
- Nothing
- Litter/garbage
- Development along river
- River etiquette by others
- Other (specify)

Other than weather...

How would you rate your experience at the *takeout*? Very satisfactory satisfied dissatisfied very unsatisfied

What was satisfactory (good) about your experience at the takeout? (Check all that apply)

- It was quick
- Few people there
- Lots of people there
- Clean restrooms
- No line at the restroom
- Campsites in good condition
- Good condition of boat ramp
- Parking
- Other
 (specify)

What	was less than satisfa	actory about your ex	perience at the tak	eout? (Check all that	apply)						
•	Delayed at take out										
•	Obnoxious/loud be	havior by others									
•	Dirty restrooms	aads at EAS									
•	Poor condition of c	amnsites at FAS									
•	Poor condition of boat ramps at FAS										
•	Litter/garbage										
•	Parking										
•	Too many people										
•	Nothing										
•	Other										
	(specify)										
9.	What is your home	zip code?									
	·	· _									
10.	. Do you have a curre	ent Montana fishing	license? Yes N	10							
11.	Does anvone in vou	ir group have a curre	ent Montana fishing	license? (N/A would	be if the group						
	size was I and the r	espondent has a fish	ing license)								
			re	25 NO							
12.	May I ask your age	}									
12	In closing, is there	and thing you could t	toll us that would ma	ko vour port Uppor'	Vallowstopa						
15.	River experience ev	ven better?	tell us that would ha	ike your next opper	renowstone						
14.	Gender	Male	Female	Unsure	(observed)?						
Record	led by surveyor.										
15.	Temperature										
16.	Wind										
17.	Water clarity										
18.	Precipitation										
19.	. Date/time										
Thank	vou for your time. If	vou are interested ir	learning more abou	It the project and/or	receiving						
update	s on the project and	its results, I have a b	ousiness card with co	ontact information to	sign up for our						
emails	and website.										

Appendix B: Observation Form

Circle Month:	July	August	Septemb	er			
Circle day:	123	4567	8 9 10 11	12 13 14 15 16 1	7 18 19 20 2	21 22 23 24	25 26 27 28 29 30 31
Start time:			AM/PM	End time:		AM/PM	Observer Initials

Weather- circle one per column

TEMP	WIND	RIVER CONDITION	PERCIP
Cool/cold	Calm	Clear water	Threatening
Warm	Breezy	Off-color water	Rainy
Hot	Windy	Muddy water	Stormy

Mark the site you are observing (listed in downstream order, Gardiner-to-Livingston)

Town access (mile 0)	1	Point of Rocks/Hookum (mile 21.6)	10	Dan Bailey/Paradise (mile 40.3)	18		
Queen of the Waters (mile 2.2)	2	Point of Rocks MDT (mile 22.5)	11	Loch Leven (mile 44.4)	19		
McConnell Landing (mile 3.5)	3	Emigrant Rest Area (mile 25.2)	12	Loch Leven Picnic (mile 45.5)	20		
Brogran's Landing (mile 7.4)	4	Emigrant (mile 33.5)	13	Mallard's Rest (mile 47.3)	21		
Cinnabar/Corwin Sprs. (mile 8)	5	Emigrant West (mile 34.1)	14	Pine Creek (mile 50.7)	22		
Slip & Slide (mile 12.9)	6	Grey Owl (mile 36)	15	Mouth of DePuys (mile 57.5)	23		
Joe Brown (mile 13.7)	7	Chicory (mile 36)	16	Carter's Bridge (mile 58.5)	24		
Crystal Cross (mile 17.5)	8	Mill Creek/Pray Bridge (mile 40)	17	Free River (mile 58)	25		
Carbella (mile 18)	9			Mayor's Landing (mile 64.7)	26		
PRIVATE PROPERTY	PRIVATE PROPERTY/OTHER (describe):						

A. BEGINNING OF SHIFT COUNT:

- 1. # of vehicles in parking area/site______
- 2. # of boat trailers in parking area_____
- 3. Total # of adults at the site_____
- 4. Total # of young adults/children (<18) at the site______

Check observed activities occurring at the site:

- 5. _____Swimming/wading/beaching
- 6. _____Fishing from shore/wading
- 7. ____Camping (tents/RV's/trailers present)
- 8. ____Picnicking

B. END OF SHIFT COUNT:

- 1. # of vehicles in parking area/site_____
- 2. # of boat trailers in parking area_____
- 3. Total # of adults at the site_____
- 4. Total # of young adults/children (<18) at the site_____

Check which activities were occurring at the site:

- 5. _____Swimming/wading/beaching
- 6. _____Fishing from shore/wading
- 7. ____Camping (tents/RV's/trailers present)
- 8. ____Picnicking

- 9. _____Dog walking/exercising
- 10. _____Bird watching/nature observation
- 11. _____Bank angling
- 12. ____hanging out

TOTAL

TOTAL

9. ____Dog walking/exercising

- 10. _____Bird watching/nature observation
- 11. _____Bank angling
- 12. ____hanging out

<u>C. DURING SHIFT COUNT</u>: Activity on the river going by, launching, getting off river TOTAL TOTAL

Commercial	Private
1. Fishing Craft	
a. Drift boats: Commercial:	Private:
# people: Commercial:	Private:
b. Rafts: Commercial:	Private:
# people: Commercial:	Private:
c. Other Craft: Commercial:	Private:
# people: Commercial:	Private:
 2. Non-fishing Craft a. Drift boats (non-fishing): Commercial: 	Private:
# people: Commercial:	Private:
b. Rafts (non-fishing): Commercial:	Private:
# people: Commercial:	Private:
c. Kayaks/canoes (non-fishing): Commercial:	Private:
# people: Commercial:	Private:
d. Tubes/floaties: Commercial:	Private:
# people: Commercial:	Private:
3. Paddle boards	
4. a. Number of vessels launching	
# people	
b. Number of vessels taking out	
# people taking out	
c. Number of vessels continuing through	
# people continuing through	

What was the most # of vehicles lined up to launch at one time during observation shift?

COMMENTS:

Appendix C: Individual FAS Observation Data

Private Property – ReedFly Farm: 5 observations for craft passing by

Month, day of week, calendar day observations completed

	July	August	Sept.	
				Total/week day
Saturday	4th; 11 th			2
Sunday	12 th	2 nd		2
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Total	3	1		4 (reported)

Note: one date was not submitted

Number of **morning start** times: 0 Number of **morning end** times: 0 Number of afternoon start times:

Number of afternoon/evening end times:

5 5

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	0%	Calm	80%	Clear water	80%	Threatening	0%
Warm	40%	Breezy	20%	Off-color water	20%	Rainy	0%
Hot	60%	Windy	0%	Muddy water	0%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	0%	Calm	80%	Clear water	80%	Threatening	0%
Warm	40%	Breezy	20%	Off-color water	20%	Rainy	0%
Hot	60%	Windy	0%	Muddy water	0%	Stormy	0%

	Fishi	Fishing			ishing
	Commercial	Private		Commercial	Private
Drift boats passing by	19	32		0	7
People in drift boats	52	88		-	14
	Commercial	Private		Commercial	Private
Rafts passing by	0	5		0	42
People passing by	-	13		-	137
	Commercial	Private		Commercial	Private
'Other' craft' passing by	0	0		0	55
People passing by	-	-		-	64

COMMENTS by Observer None

Emigrant: 15 observation points

	July	August	Sept.	
				Total/week day
Saturday	25 th			1
Sunday	12 th ;		6 th	3
	19 th			
Monday		3rd; 24 th		2
Tuesday		11 th ; 25 th		2
Wednesday	8 th	5 th ;		2
Thursday	16 th ;			2
	30 th			
Friday		21 st ; 28 th	4 th	3
Total	6	7	2	15

Month, day of week, calendar day observations completed

Number of **morning start** times: 5

Number of afternoon start times: 10

Number of **morning end** times: 3

Number of afternoon/evening end times: 12

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	0%	Calm	67%	Clear water	60%	Threatening	0%
Warm	27%	Breezy	27%	Off-color water	33%	Rainy	0%
Hot	73%	Windy	7%	Muddy water	7%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	0%	Calm	53%	Clear water	60%	Threatening	0%
Warm	27%	Breezy	40%	Off-color water	33%	Rainy	0%
Hot	73%	Windy	7%	Muddy water	7%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift				End of shift		
	Mean	Range	Total		Mean	Range	Total
Vehicles in parking area/site	26.6	1-74	399		27.6	5-76	414
Boat trailers in parking area	12.67	1-33	190		12.73	1-39	191
Adults	5.6	0-15	84		5.87	0-13	88
Children	2	0-6	30		1.27	0-3	19

	Begin shift	End Shift
Swimming	8 (53% of time)	7 (47% of time)
Shore/wade fishing	3 (20% of time)	3 (20% of time)
Camping (tents/RV's, trailers present)	0	0
Picnicking	1 (7% of time)	1 (7% of time)
Dog walking/exercising	0	2 (13% of time)
Bird watching/nature observation	1 (7% of time)	0
Hanging out	10 (67% of time)	6 (40% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishi	ing	Non-Fishing		
	Commercial	Private	Commercial	Private	
Drift boats launching	0	0	0	0	
People launching	-	-	-	-	
Drift boats passing by	0	7	0	0	
People in drift boats	-	20	-	-	
Drift boats taking out	0	0	0	0	
People taking out	-	-	-	-	
	Commercial	Private	Commercial	Private	
Rafts launching	0	1	0	2	
People launching	-	4	-	8	
Rafts passing by	0	2	0	2	
People passing by	-	5	-	6	
Rafts taking out	0	0	0	0	
People taking out	-	-	-	-	
	Commercial	Private	Commercial	Private	
'Other' craft' launching	0	0	0	6	
People launching	-	-	-	8	
'Other' craft' passing by	0	0	0	0	
People passing by	-	-	-	-	
'Other' craft' taking out	0	0	0	0	
People taking out	-	-	-	-	

of vehicles lined up to launch during observation shifts

O vehicles launching during 1 observation; 1 vehicle observed 8 different times; 2 vehicles observed 4 times; 3 vehicles observed 1 time

COMMENTS by Observer

None

Grey Owl: 20 observation points

	July	August	Sept.	
				Total/week day
Saturday	4 th ; 11 th	1 st ; 1 st ;	5 th	5
Sunday	19 th	9 th ;		2
Monday	20 th ;	3 rd ; 24 th ; 31 st		4
Tuesday	7 th ; 28 th			2
Wednesday	29 th	19 th ;	2 nd ; 9 th	4
Thursday	9 th			1
Friday	3 rd	14 th ;		2
Total	9	8	3	20

Month, day of week, calendar day observations completed

Number of **morning start** times: 10

Number of afternoon start times: 10

Number of **morning end** times: 6

Number of **afternoon/evening** end times: 14

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	25%	Calm	65%	Clear water	60%	Threatening	0%
Warm	25%	Breezy	25%	Off-color water	30%	Rainy	0%
Hot	50%	Windy	10%	Muddy water	10%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	10%	Calm	60%	Clear water	0%	Threatening	0%
Warm	35%	Breezy	30%	Off-color water	0%	Rainy	0%
Hot	55%	Windy	10%	Muddy water	0%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift				E	nd of shift	
	Mean	Range	Total		Mean	Range	Total
Vehicles in parking area/site	15.95	0-58	319		18.25	0-69	365
Boat trailers in parking area	9.7	0-33	194		12.10	0-43	242
Adults	3.6	0-13	72		4.30	0-12	86
Children	0.58	0-4	11		0.68	0-8	13

	Begin shift	End Shift
Swimming	0	0
Shore/wade fishing	2 (10% of time)	0
Camping (tents/RV's, trailers present)	0	0
Picnicking	0	0
Dog walking/exercising	0	2 (10% of time)
Bird watching/nature observation	0	0
Hanging out	5 (25% of time)	5 (25% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishing			Non-Fishing		
	Commercial	Private		Commercial	Private	
Drift boats launching	0	6	0	1		
People launching	-	18		-	2	
Drift boats passing by	0	9		0	1	
People in drift boats	-	26		-	4	
Drift boats taking out	0	0		0	0	
People taking out	-	-		-	-	
	Commercial	Private		Commercial	Private	
Rafts launching	0	0		0	2	
People launching	-	-		-	4	
Rafts passing by	0	9		0	10	
People passing by	-	27		-	51	
Rafts taking out	0	0		0	0	
People taking out	-	-		-	-	
	Commercial	Private		Commercial	Private	
'Other' craft' launching	0	0		0	7	
People launching	-	-		-	8	
'Other' craft' passing by	0	0		0 7		
People passing by	-	-		- 9		
'Other' craft' taking out	0	0		0 0		
People taking out	-	-		-	_	

of vehicles lined up to launch during observation shifts

• 0 vehicles launching during 2 observations; 1 vehicle observed 9 times; 2 vehicles observed 4 times; 3 vehicles observed 3 times

COMMENTS by Observer

No boats passed by on one observation

Mill Creek: 20 observation points

	July	August	Sept.	
				Total/week day
Saturday	11 th	1 st		2
Sunday	12 th ; 26 th	9 th		3
Monday		3 rd ; 24 th ; 24 th ; 31 st	7 th	5
Tuesday	21 st			1
Wednesday		5 th ; 19 th	9 th	3
Thursday	30 th	27 th		2
Friday	3 rd ; 10 th	28 th	4 th	4
Total	7	10	3	20

Month, day of week, calendar day observations completed

Number of **morning start** times: 6

Number of afternoon start times: 14

Number of **morning end** times: 3

Number of **afternoon/evening** end times: 17

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	30%	Calm	70%	Clear water	65%	Threatening	0%
Warm	10%	Breezy	15%	Off-color water	25%	Rainy	10%
Hot	60%	Windy	15%	Muddy water	10%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	15%	Calm	50%	Clear water	65%	Threatening	0%
Warm	25%	Breezy	35%	Off-color water	25%	Rainy	10%
Hot	60%	Windy	15%	Muddy water	10%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift				E	nd of shift	
	Mean	Range	Total		Mean	Range	Total
Vehicles in parking area/site	3.4	0-10	68		3.47	0-12	66
Boat trailers in parking area	1.35	0-4	27		1.21	0-5	23
Adults	1.6	0-7	32		0.53	0-2	10
Children	0.05	0-1	1		0	0	0

	Begin shift	End Shift
Swimming	0	1 (5% of time)
Shore/wade fishing	2 (10% of time)	4 (20% of time)
Camping (tents/RV's, trailers present)	0	0
Picnicking	0	0
Dog walking/exercising	0	0
Bird watching/nature observation	0	0
Hanging out	0	0

Participation in activities (# of times observed out of 19 observations)

	Fishi	ng	Non-F	ishing
	Commercial	Private	Commercial	Private
Drift boats launching	0	5	0	0
People launching	-	14	-	-
Drift boats passing by	3	75	0	6
People in drift boats	3	208	-	22
Drift boats taking out	0	3	0	0
People taking out	-	7	-	-
	Commercial	Private	Commercial	Private
Rafts launching	0	2	0	4
People launching	-	6	-	15
Rafts passing by	0	45	0	82
People passing by	-	137	-	291
Rafts taking out	0	1	0	1
People taking out	-	1	-	2
	Commercial	Private	Commercial	Private
'Other' craft' launching	0	0	0	11
People launching	-	-	-	11
'Other' craft' passing by	0	2	0	163
People passing by	-	2	-	176
'Other' craft' taking out	0	0	0	2
People taking out	-	-	-	2

of vehicles lined up to launch during observation shifts

0 vehicles launching 6 observation times; 1vehicle launching observed 9 different times;
 2 vehicles observed 2 times

COMMENTS by Observer

No boats passed by the whole time on one shift

Dan Bailey/Paradise: 16 observation points

	July	August	Sept.	
				Total/week day
Saturday	25 th		6 th	2
Sunday	12 th ;			1
Monday	13 th ; 20 th ; 20 th	3 rd ;	7 th	5
Tuesday		11 th ; 25 th ;		2
Wednesday	8 th		9 th	2
Thursday		27 th ;		1
Friday	24 th ;	21 st ;	4 th	3
Total	7	5	4	16

Month, day of week, calendar day observations completed

Number of **morning start** times: 9

Number of afternoon start times:

7

Number of **morning end** times: 5

Number of afternoon/evening end times: 11

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	31%	Calm	56%	Clear water	75%	Threatening	0%
Warm	31%	Breezy	38%	Off-color water	25%	Rainy	0%
Hot	38%	Windy	6%	Muddy water	0%	Stormy	6%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	13%	Calm	50%	Clear water	75%	Threatening	0%
Warm	38%	Breezy	47%	Off-color water	25%	Rainy	0%
Hot	50%	Windy	6%	Muddy water	0%	Stormy	6%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift			E	nd of shift	
	Mean	Range	Total	Mean	Range	Total
Vehicles in parking area/site	4.38	1-8	70	3.88	0-7	62
Boat trailers in parking area	0.25	0-6	4	0.13	0-1	2
Adults	2.56	0-6	41	2.81	0-8	45
Children	0.31	0-3	5	0.25	0-2	4

	Begin shift	End Shift
Swimming	0	0
Shore/wade fishing	2 (13% of time)	2 (13% of time)
Camping (tents/RV's, trailers present)	15 (94% of time)	13 (81% of time)
Picnicking	8 (50% of time)	5 (31% of time)
Dog walking/exercising	1 (6% of time)	0
Bird watching/nature observation	0	0
Hanging out	1 (6% of time)	2 (13% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishi	ng	Non-Fishing		
	Commercial	Private	Commercial	Private	
Drift boats launching	0	6	0	0	
People launching	-	17	-	-	
Drift boats passing by	0	34	2	4	
People in drift boats	-	103	5	9	
Drift boats taking out	0	0	0	0	
People taking out	-	-	-	-	
	Commercial	Private	Commercial	Private	
Rafts launching	0	2	0	0	
People launching	-	2	-	-	
Rafts passing by	0	25	9	26	
People passing by	-	76	29	97	
Rafts taking out	0	0	0	0	
People taking out	-	-	-	-	
	Commercial	Private	Commercial	Private	
'Other' craft' launching	0	0	0	1	
People launching	-	-	-	1	
'Other' craft' passing by	0	0	14 67		
People passing by	-	-	19 78		
'Other' craft' taking out	0	0	0 0		
People taking out	-	-	_	-	

of vehicles lined up to launch during observation shifts

• 0 vehicles lined up to launch during any observation period

COMMENTS by Observer

No boats passed by on one observation

Loch Leven: 17 observation points

	July	August	Sept.	
				Total/week day
Saturday	4 th ; 11 th	22 nd	5 th	4
Sunday	19 th ; 26 th	9 th		3
Monday				0
Tuesday	21 st	4 th ; 11 th ; 25 th	1 st	5
Wednesday	29 th	19 th		2
Thursday	16^{th}			1
Friday	3 rd		4 th	2
Total	8	6	3	17

Month, day of week, calendar day observations completed

Number of **morning start** times: 6

Number of afternoon start times: 12

Number of **morning end** times: 2

Number of **afternoon/evening** end times: 15

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	18%	Calm	53%	Clear water	71%	Threatening	0%
Warm	18%	Breezy	41%	Off-color water	29%	Rainy	11%
Hot	65%	Windy	6%	Muddy water	0%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	6%	Calm	53%	Clear water	71%	Threatening	0%
Warm	24%	Breezy	35%	Off-color water	29%	Rainy	0%
Hot	71%	Windy	12%	Muddy water	0%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift			E	nd of shift	
	Mean	Range	Total	Mean	Range	Total
Vehicles in parking area/site	25.39	5-51	457	25.59	4-51	435
Boat trailers in parking area	9.17	0-20	165	8.82	1-19	150
Adults	8.50	2-30	153	8.29	0-27	141
Children	0.83	0-8	15	2.41	0-8	41

	Begin shift	End Shift
Swimming	0	1 (6% of time)
Shore/wade fishing	2 (11% of time)	1 (6% of time)
Camping (tents/RV's, trailers present)	15 (83% of time)	14 (78% of time)
Picnicking	11 (61% of time)	12 (67% of time)
Dog walking/exercising	4 (22% of time)	2 (11% of time)
Bird watching/nature observation	1 (6% of time)	0
Hanging out	10 (56% of time)	9 (50% of time)

Participation in activities (# of times observed out of 18 observations)

	Fishi	ng	Non-F	ishing
	Commercial	Private	Commercial	Private
Drift boats launching	0	15	0	0
People launching	-	38	-	-
Drift boats passing by	0	22	0	0
People in drift boats	-	61	-	-
Drift boats taking out	4	11	0	0
People taking out	4	37	-	-
	Commercial	Private	Commercial	Private
Rafts launching	2	5	0	0
People launching	4	13	-	-
Rafts passing by	0	10	0	12
People passing by	-	27	-	34
Rafts taking out	0	0		
People taking out	-	-		
	Commercial	Private	Commercial	Private
'Other' craft' launching	0	0	0	0
People launching	-	-	-	-
'Other' craft' passing by	0	0	0	5
People passing by	-	-	- 6	
'Other' craft' taking out	0	0	1 19	
People taking out	-	-	2	23

of vehicles lined up to launch during observation shifts

0 vehicles launching during 2 observations; 1 vehicle observed launching 10 times; 2 vehicles observed 4 times; 4 vehicles observed 1 time

COMMENTS by Observer

could be double or triple counting boats and such because the same vessel can be observed a couple of times along the river depending on how many volunteers are observing. possible solution would be just to count when launching so as not to have redundant counting making data suspect.

Analyst's note: only 1 of the counts/observations was completed by a volunteer and the rest of the data was completed by the paid intern. In the case of this FAS, the volunteer didn't work on the same day as the intern, therefore no double counting occurred.

Mallard's Rest: 19 observation points

	July	August	Sept.	
				Total/week day
Saturday	25 th	1 st ; 8 th ; 15 th ; 22 nd		5
Sunday	12 th			1
Monday	20 th ;		7 th	2
Tuesday	7 th	4 th ; 25 th	1 st	4
Wednesday	8 th		2 nd	2
Thursday	30 th	20 th		2
Friday	10 th ; 24 th	14 th		3
Total	8	8	3	19

Month, day of week, calendar day observations completed

Number of **morning start** times: 8

Number of afternoon start times:

Number of afternoon/evening end times:

11

15

Number of **morning end** times: 4

Beginning of shift Conditions: Percent of time									
TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%		
Cool/cold	6%	Calm	58%	Clear water	68%	Threatening	0%		
Warm	33%	Breezy	26%	Off-color water	21%	Rainy	0%		
Hot	61%	Windy	15%	Muddy water	11%	Stormy	5%		

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	5%	Calm	53%	Clear water	68%	Threatening	0%
Warm	32%	Breezy	32%	Off-color water	21%	Rainy	5%
Hot	63%	Windy	16%	Muddy water	11%	Stormy	5%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift			End of shift		
	Mean	Range	Total	Mean	Range	Total
Vehicles in parking area/site	34.32	13-91	652	35.26	9-93	670
Boat trailers in parking area	11.05	2-33	210	12.05	3-30	229
Adults	8.26	1-16	157	7.58	0-28	144
Children	1.50	0-5	27	1.89	0-9	36

	Begin shift	End Shift
Swimming	4 (21% of time)	4 (21% of time)
Shore/wade fishing	5 (26% of time)	6 (32% of time)
Camping (tents/RV's, trailers present)	19 (100% of time)	17 (90% of time)
Picnicking	12 (63% of time)	11 (60% of time)
Dog walking/exercising	3 (16% of time)	2 (11% of time)
Bird watching/nature observation	3 (16% of time)	1 (5% of time)
Hanging out	9 (47% of time)	9 (47% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishing			Non-Fishing		
	Commercial	Private		Commercial	Private	
Drift boats launching	0	7		0	0	
People launching	-	18		-	-	
Drift boats passing by	0	3		0	1	
People in drift boats	-	8		-	2	
Drift boats taking out	1	9		0	2	
People taking out	3	28		-	4	
	Commercial	Private		Commercial	Private	
Rafts launching	0	0		0	7	
People launching	-	-		-	29	
Rafts passing by	0	7		4	5	
People passing by	-	18		10	18	
Rafts taking out	0	6		0	13	
People taking out	-	12		-	38	
	Commercial	Private		Commercial	Private	
'Other' craft' launching	0	0		0	4	
People launching	-	-		-	5	
'Other' craft' passing by	0	1		0	9	
People passing by	-	1		-	11	
'Other' craft' taking out	0	1		0	25	
People taking out	-	1		-	31	

of vehicles lined up to launch during observation shifts

 0 vehicles launching during 1 observation; 1 vehicle launching observed 7 different times; 2 vehicles observed 6 times; 3 vehicles observed launching 1 time; 4 vehicles observed once; 5 vehicles observed launching once

COMMENTS by Observer

Observed one truck with boat drive through launch area and move on to another spot (likely due to off water clarity).

Pine Creek: 19 observation points

	July	August	Sept.	
				Total/week day
Saturday	25 th	8 th ; 22 nd	5 th	3
Sunday	26 th			1
Monday	13 th ; 20 th	31 st		3
Tuesday	7 th	4 th ; 11 th		3
Wednesday	29 th	5 th	2 nd ; 9 th	4
Thursday	16 th	20 th		2
Friday	3 rd	28 th		3
Total	8	8	3	19

Month, day of week, calendar day observations completed

Number of **morning start** times: 7 Number of **morning end** times: 3 Number of afternoon start times: 12

Number of afternoon/evening end times: 16

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	16%	Calm	58%	Clear water	80%	Threatening	0%
Warm	26%	Breezy	26%	Off-color water	21%	Rainy	0%
Hot	58%	Windy	16%	Muddy water	0%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	11%	Calm	68%	Clear water	79%	Threatening	0%
Warm	26%	Breezy	16%	Off-color water	21%	Rainy	0%
Hot	63%	Windy	16%	Muddy water	0%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift				End of shift		
	Mean	Range	Total		Mean	Range	Total
Vehicles in parking area/site	19.68	4-74	374		18.37	3-52	349
Boat trailers in parking area	10.58	2-38	201		9.32	2-27	177
Adults	3.42	0-12	65		3.32	0-15	63
Children	0.17	0-2	3		0.67	0-4	12

	Begin shift	End Shift
Swimming	0	0
Shore/wade fishing	2 (11% of time)	2 (11% of time)
Camping (tents/RV's, trailers present)	0	0
Picnicking	1 (15of time)	0
Dog walking/exercising	2 (11% of time)	1 (5% of time)
Bird watching/nature observation	0	0
Hanging out	5 (26% of time)	4 (21% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishi	ng	Non-Fishing		
	Commercial	Private	Commercial	Private	
Drift boats launching	0	11	0	0	
People launching	-	34	-	-	
Drift boats passing by	0	0	0	1	
People in drift boats	-	-	-	4	
Drift boats taking out	6	3	0	0	
People taking out	17	10	-	-	
	Commercial	Private	Commercial	Private	
Rafts launching	0	7	0	1	
People launching	-	23	-	3	
Rafts passing by	0	2	0	11	
People passing by	-	6	-	39	
Rafts taking out	0	2	0	7	
People taking out	-	5	-	29	
	Commercial	Private	Commercial	Private	
'Other' craft' launching	0	0	0	0	
People launching	-	-	-	-	
'Other' craft' passing by	0	3	0	18	
People passing by	-	4	- 20		
'Other' craft' taking out	0	4	0	7	
People taking out	-	5	-	11	

of vehicles lined up to launch during observation shifts

• 1 vehicle launching observed 9 different times; 2 vehicles observed 6 times; 4 vehicles observed launching 2 times

COMMENTS by Observer

None

Carter's Bridge: 23 observation points

	July (10)	August (10)	Sept. (3)	
				Total/week day
Saturday	4 th ; 11 th	1 st ; 8 th ; 29 th		5
Sunday	5 th		6 th	2
Monday	13 th ; 13 th ; 27 th	3 rd		4
Tuesday	7 th ; 21 st		1 st ;	3
Wednesday	29 th	5 th ; 19 th	2 nd	4
Thursday		20 th ; 20 th ; 27 th		3
Friday	24 th	21 st		2
Total	10	10	3	23

Month, day of week, calendar day observations completed

Number of **morning start** times: 5

Number of afternoon start times:

18

Number of **morning end** times: 2

Number of **afternoon/evening** end times: 21

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	9%	Calm	48%	Clear water	70%	Threatening	4%
Warm	28%	Breezy	35%	Off-color water	26%	Rainy	0
Hot	70%	Windy	17%	Muddy water	4%	Stormy	0

*may not add to 100% due to rounding

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	13%	Calm	39%	Clear water	70%	Threatening	4%
Warm	17%	Breezy	44%	Off-color water	26%	Rainy	4%
Hot	70%	Windy	17%	Muddy water	4%	Stormy	4%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift			E	Ind of shift	
	Mean	Range	Total	Mean	Range	Total
Vehicles in parking area/site	27.17	3-67	625	24.7	2-76	568
Boat trailers in parking area	9.78	0-27	225	9.39	0-25	216
Adults	6.74	0-37	155	6.04	0-21	139
Children	1.25	0-8	25	1.05	0-7	20

	Begin shift	End Shift
Swimming	7 (30% of time)	4 (17% of time)
Shore/wade fishing	4 (17% of time)	3 (13% of time)
Camping (tents/RV's, trailers present)	1 (4% of time)	1 (4% of time)
Picnicking	3 (13% of time)	4 (17% of time)
Dog walking/exercising	6 (26% of time)	6 (26% of time)
Bird watching/nature observation	3 (13% of time)	1 (4% of time)
Hanging out	11 (48% of time)	12 (52% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishing			Non-Fishing		
	Commercial	Private		Commercial	Private	
Drift boats launching	0	6		0	0	
People launching	-	15		-	-	
Drift boats passing by	0	5		0	1	
People in drift boats	-	13		-	4	
Drift boats taking out	0	8		0	0	
People taking out	-	26		-	-	
	Commercial	Private		Commercial	Private	
Rafts launching	0	1		0	14	
People launching	-	2		-	36	
Rafts passing by	0	0		0	5	
People passing by	-	-		-	15	
Rafts taking out	0	4		0	5	
People taking out	-	15		-	16	
	Commercial	Private		Commercial	Private	
'Other' craft' launching	0	0		0	5	
People launching	-	-		-	5	
'Other' craft' passing by	0	0		0	0	
People passing by	-	-		-	-	
'Other' craft' taking out	0	0		0	10	
People taking out	-	-		-	12	

of vehicles lined up to launch during observation shifts

 0 vehicle launching during 1 observation; 1 vehicle observed 7 times; 2 vehicles observed 7 times; 3 vehicles observed 4 times; 4 vehicles observed 1 time; 5 vehicles observed 3 times

COMMENTS by Observer

2 children under 18 (teenagers) jumped off bridge 9 times; many boat trailers parked across river, separate from official river access

Many boat trailers parked across river not in actual river access.

Mayor's Landing: 19 observation points

	July	August	Sept.	
				Total/week day
Saturday	4 th	8 th ; 22 nd	5 th	4
Sunday	19 th		6th	2
Monday		24 th ; 31 st		2
Tuesday	21 st	4 th	1 st	3
Wednesday	8 th			1
Thursday	16 th ; 30 th	27 th		3
Friday	10 th ; 24 th	14 th ; 21 st		4
Total	8	8	3	19

Month, day of week, calendar day observations completed

Number of **morning start** times: 7 Number of **morning end** times: 2 Number of afternoon start times:12Number of afternoon/evening end times:17

Beginning of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	5%	Calm	32%	Clear water	68%	Threatening	0%
Warm	16%	Breezy	53%	Off-color water	26%	Rainy	0%
Hot	79%	Windy	16%	Muddy water	5%	Stormy	0%

End of shift Conditions: Percent of time

TEMP	%	WIND	%	RIVER CONDITION	%	PERCIP	%
Cool/cold	5%	Calm	26%	Clear water	68%	Threatening	1%
Warm	26%	Breezy	58%	Off-color water	26%	Rainy	0%
Hot	68%	Windy	16%	Muddy water	5%	Stormy	0%

Vehicles and people at beginning and end of shift (2-hour span)

	Beginning of shift			End of shift		
	Mean	Range	Total	Mean	Range	Total
Vehicles in parking area/site	16.26	3-39	309	16.53	2-32	314
Boat trailers in parking area	6.16	0-18	117	6.00	0-16	114
Adults	6.00	0-22	114	4.56	0-9	82
Children	1.68	0-9	32	0.24	0-2	4

	Begin shift	End Shift
Swimming	4 (21% of time)	0
Shore/wade fishing	0	0
Camping (tents/RV's, trailers present)	1	1
Picnicking	2 (11% of time)	1
Dog walking/exercising	16 (84% of time)	15 (79% of time)
Bird watching/nature observation	2 (11% of time)	1
Hanging out	7 (37% of time)	5 (26% of time)

Participation in activities (# of times observed out of 19 observations)

	Fishing			Non-Fishing		
	Commercial	Private		Commercial	Private	
Drift boats launching	4	0		0	0	
People launching	12	-		-	-	
Drift boats passing by	0	0		0	0	
People in drift boats	-	-		-	-	
Drift boats taking out	0	0		0	0	
People taking out	-	-		-	-	
	Commercial	Private		Commercial	Private	
Rafts launching	0	0		0	0	
People launching	-	-		-	-	
Rafts passing by	0	0		0	0	
People passing by	-	-		-	-	
Rafts taking out	0	0		0	0	
People taking out	-	-		-	-	
	Commercial	Private		Commercial	Private	
'Other' craft' launching	0	0		0	0	
People launching	-	-		-	-	
'Other' craft' passing by	0	0		0	0	
People passing by	-	-		-	-	
'Other' craft' taking out	0	0	0		0	
People taking out	-	-		-	-	

of vehicles lined up to launch during observation shifts

- During 9 different observation times, **one** vehicle was launching
- o During 6 different observation times **two** vehicles were lined up to launch

COMMENTS by Observer

None