

**The Social and Economic Impact of the Removal of the Gold Ray Dam:
A Two-Year Comparison of Recreational Usage
2010 – 2012**

Dr. Eva Skuratowicz
Jacquelyn Case
April 30, 2013
Southern Oregon University Research Center
skuratoe@sou.edu
541-552-6278

Introduction

The Southern Oregon University Research Center (SOURCE) was part of a larger team of governmental and nonprofit organizations that studied the removal of the Gold Ray Dam from the Rogue River, which is located near Central Point, Oregon. SOURCE was tasked with monitoring and analyzing the social/recreational and economic outcomes of dam removal. This report covers two phases of analysis: baseline information and two year post-removal follow-up. NOAA funded the baseline study that SOURCE did on the Rogue River in the summer of 2010. The Phase I study established pre-dam removal recreational and economic usage patterns in the Gold Ray Dam section of the Rogue. The two-year follow-up study, Phase II, was funded by Jackson County, and data were gathered at the former Gold Ray Dam site in the summer of 2012. This Phase II study gathered two-year post-removal data on recreational and economic usage to determine short-term outcomes.

Methodology

In order to assess river usage and revenue generated on the Rogue River over a two-year period, we deployed a number of research techniques. We counted the number of visitors (generally on an hourly basis) and documented the activity they were engaged in. At the same time we chose visitors to survey about their recreational usage, and while the population served to be fairly homogeneous, we made our best attempt to select for diversity in the areas of gender, age and race/ethnicity. To explore the revenue generated on the river we did phone interviews with fishing guides as well as commercial rafting companies.

We selected our research sites (see Figure 1) by first consulting with experts in the area, including river guides (both fishing and rafting) and then we observed the area along the section of the river we intended to study. Based on what we discovered, we initially chose six field sites: Shady Cove River Park, Tou Velle State Park, Nugget/Hayes Falls, Dodge Bridge, Fishers Ferry and the Gold Hill Sports Park. Shady Cove was a comparison site, and in 2012 we removed it from the study because it had not proved to be useful as a comparison in 2010. For Phase II, there were five field sites.

For both phases of the study, we typically stationed one researcher at each of the main field sites and one or two researchers “roved” among the other sites. One of our main field sites was Tou Velle State Park, upstream of the Gold Ray Dam (GRD), that consisted of two separate parks: a large picnic area as well as a boat ramp that was popular for fishing guides launching onto the river. It was here as

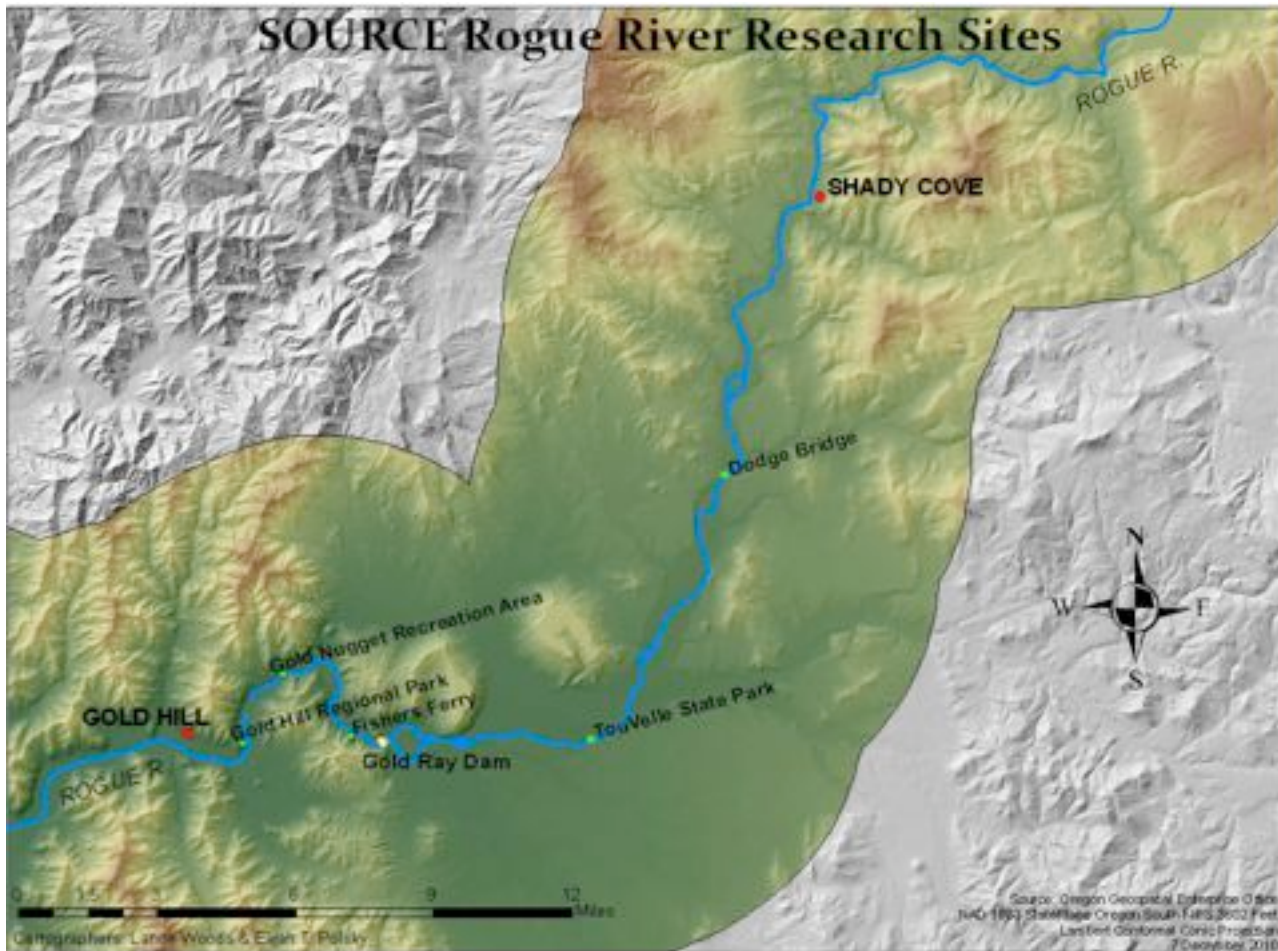
well that we discovered a beach area popular for picnicking and swimming. The other main site was Fishers Ferry, directly downstream of the GRD, which was a popular spot for bank anglers and sunbathers. It also served as the put-in location for most of the commercial rafting companies. Recreational users at Tou Velle and Fishers Ferry were counted hourly. Dodge Bridge was a field site farther upstream from the GRD and generally offered access to anglers and fishing guides. Dodge Bridge was counted once daily during Phase I in 2010 and twice daily during Phase II in 2012. We did not include 2010 Dodge Bridge data in our report because we found that the once a day count was not adequate for comparison. The Nugget/Hayes Falls take-outs (located near the Gold Nugget Recreation Area in Figure 1), farther downstream of the GRD, were surveyed at least twice a day by a roving researcher, and it was a good place to count and talk to bank anglers. Gold Hill Sports Park was also on the roving route and served as our site to survey guided rafters coming in off the river. Coordinating with the researcher at Fishers Ferry, the roving researcher surveyed the rafters while the commercial rafting companies were ending their trips.

We employed two methodologies for visitor counts. Since entry into the Rogue River was unencumbered, we positioned ourselves at commonly used access points. In some of those areas, such as the Tou Velle boat launch and Fishers Ferry, the field researchers' locations enabled them to monitor every person in the area. Thus, we used hourly counts of unique individuals at the Tou Velle boat launch and Fishers Ferry. In the other field sites, it was not possible to discern who was in the location from the previous count, so we did a total population count. At Tou Velle Picnic and Beach areas, Dodge Bridge, and Nugget Falls, we counted everyone in the location and used averages to understand usage rates.

We administered two types of survey instruments. The first was a questionnaire we used when approaching visitors who were engaging in any activity that did not involve a commercial guided rafting trip; we labeled these visitors as "non rafters" (see Appendix A for the non rafter questionnaire). By guided rafting trip, we are referring to rafting trips run by a commercial enterprise. Some of those who answered the non-rafter questionnaire were engaged in private rafting on the Rogue. The second questionnaire, for "guided rafters" was used specifically when talking to those visitors who were participating in a commercial guided rafting trip; these individuals were our guided rafter respondents (see Appendix B).

The research team from Southern Oregon University Research Center was a combination of faculty and senior-level students. For Phase I the baseline study, our interviewing and counting team consisted of five SOU students including Jacquelyn Case, Derek Bower, Katelyn Chisholm, Benjamin Nagel, and Rikki Pritzlaff; one adjunct anthropology instructor Jennifer Hayes-Clark; and the project director, Dr. Eva Skuratowicz. For Phase II, the two-year follow-up study, the interviewing and counting team consisted of students Jacquelyn Case, Sara Averbek, Katie Breen, Krista Hagman, Benjamin Katz, Ethan McClelland, and Dr. Eva Skuratowicz. For 2010, we had an average of three researchers counting and administering questionnaires for nine chosen days: four Saturdays – 6/12, 6/19, 7/3, 7/17; four Sundays – 6/6, 7/4, 7/11, 8/22 and one Monday – 8/9, between the hours of 9 a.m. and 4 p.m. Dates for these activities for 2012 were five Saturdays – 6/30, 7/7, 7/21, 8/11, 9/1; three Sundays – 7/8, 8/12, 9/2; and one Monday 8/6, and the hours in the field were between 9 a.m. and 4 p.m. Primary data analysis was conducted by Jacquelyn Case and Dr. Eva Skuratowicz. Dr. Karen Miller-Loessi, Dr. Mark Shibley, and Dr. Cynthia White also contributed to data analysis. Dr. Dan Rubenson and Kyle Pate, who were also part of the Phase I SOURCE team, produced a separate economic report that established the baseline property values for the Gold Ray Dam area.

Figure 1: Research Sites



Interviews of Recreational Users

Non-Rafter Questionnaire

In 2010, we administered a total of 101 questionnaires to river users among the various field sites along the Rogue River. The total number of questionnaire respondents for 2012 was 112. Visitors were asked about the different activities they enjoy on the river, and answered questions about how often and for how long they have been engaging in those activities on the Rogue. Activities included: fishing, rafting, canoeing, birding, picnicking, leisure (defined as a river “non-activity”, such as sun bathing, sitting to enjoy the surroundings, talking with a friend, reading a book, watching a child play, etc.), swimming, kayaking, boating, etc.

In order to assess the impact visitors make on the local economy, we asked respondents to tell us how much they spent on food and gas nearby (i.e. Shady Cove/Gold Hill) for their trip to the river. If the visitor was from more than three hours away we also asked them how much they spent on lodging, groceries, car rental, plane or bus fare, and entertainment. We asked the respondents to describe their ideal conditions of the river, including their ideal river flow, crowding, and conflict. Finally, we included a few demographic questions regarding occupation, age, and race. The respondent’s social class and gender were determined by the interviewer, based on observation.

For both phases of the study, most of our non-rafter respondents were locals. Ninety percent were from Oregon, 80% lived within 30 miles of the Rogue River, and 66% lived within 15 miles. Of those who came from outside of Oregon, 4% were from California and 5% were from another state. These people often had a long history of recreating on the Rogue as demonstrated by Table 1 below. Analyzing the spending habits of the respondents found that in 2010, 55% of all non-rafter respondents spent money locally on food or gas during their visit to the River and in 2012, that number was only 43% (see Table 2 below).

Table 1: How Long Our Respondents Have Been Coming to the Rogue

		1950s	1960s	1970s	1980s	1990s	2000
Fly Fishing	2010 N = 17	-	12%	18%	18%	24%	29%
	2012 N = 21	5%	5%	19%	10%	14%	48%
Bait/Tackle	2010 N = 53	2%	8%	11%	19%	25%	36%
	2012 N = 48	4%	2%	13%	13%	25%	35%
Rafting	2010 N = 26	-	-	8%	12%	23%	58%
	2012 N = 39	3%	0%	13%	5%	21%	59%

Table 2: Local Food and Gas Expenditures

	<u>2010</u>	<u>2012</u>
Spent less than \$20	57%	50%
Spent between \$21 and \$40	30%	38%
Spent between \$41 and \$80	13%	13%
	N = 101	N = 112

Visitor Experience

We were curious to see how respondents felt about their experience on the river and asked them to tell us not only what made for a pleasant experience (see Chart 1), but also what detracted from that experience (see Chart 2). This was an open-ended question resulting in answers with multiple characteristics, therefore our percentages add up to more than 100%. Some changes from 2010 to 2012 are worth noting for this study. In Chart 2, crowds were cited as detracting from a pleasant experience; as demonstrated from the population count analysis that follows, there were more people recreating in the former GRD area in 2012. Also, noise was cited less frequently as an issue. We attribute this to the fact that mining (dredging machines are loud) on the river had moved from the GRD section in 2010 to closer to Gold Hill in 2012. Trash and litter remained a problem in both phases of the study.

Chart 1: What Makes for a Pleasant Experience on the River?

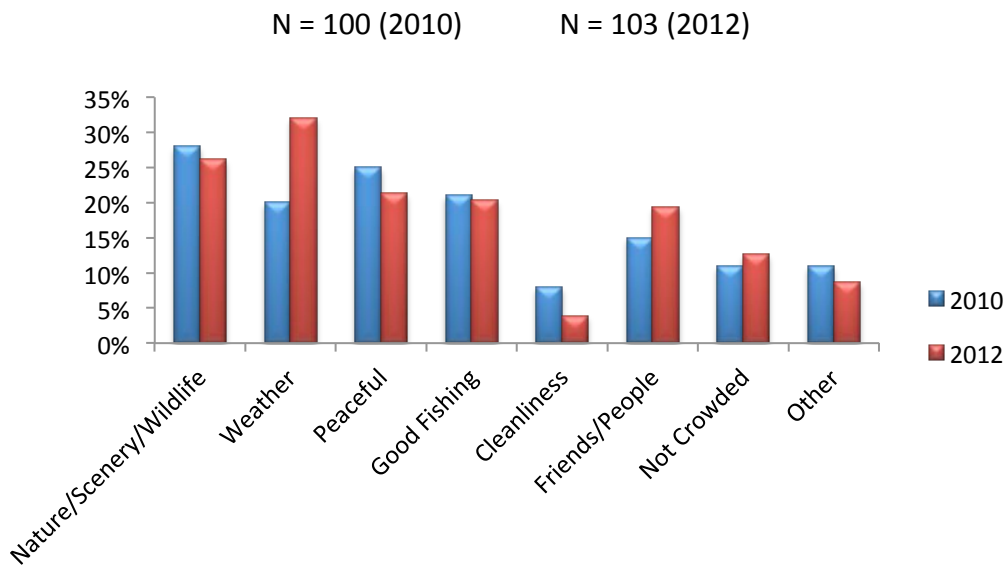
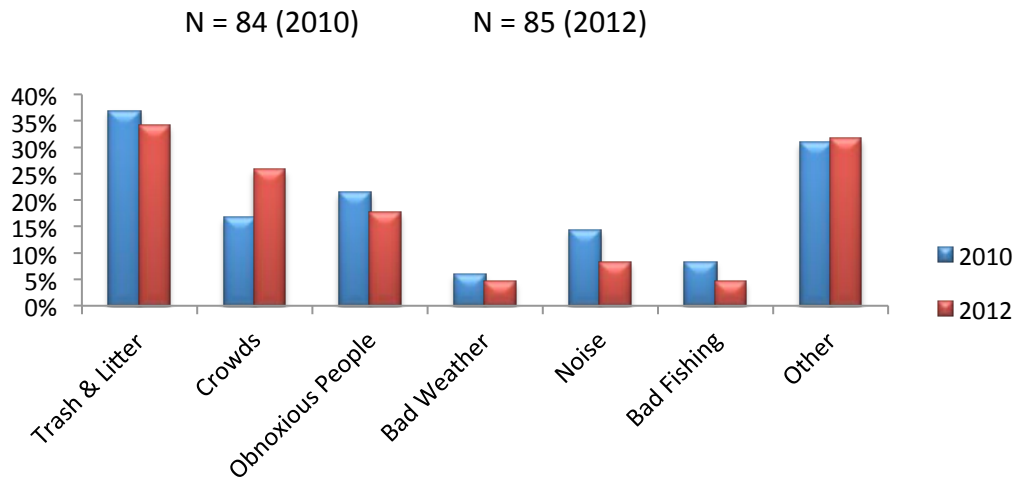


Chart 2: What Detracts from a Pleasant Experience on the River?



Demographics

We found that the average non-rafter study participant was a white male between the ages of 35 and 54 (see Table 3). Of those who were currently employed, the largest percentage in both phases fit into the category of skilled laborer (Table 4). In Phase II, we administered questionnaires to more employed and retired professionals.

Table 3: Age, Gender and Race/Ethnicity of Non-Rafter Respondents

Age		
	2010	2012
18-34	20%	26%
35-54	53%	40%
55+	27%	34%
N = 101 (2010) N = 109 (2012)		

Gender		
	2010	2012
Female	37%	33%
Male	63%	67%
N = 101 (2010) N = 105 (2012)		

Race/Ethnicity		
	2010	2012
White/Caucasian	86%	97%
Hispanic	5%	3%
Asian	2%	-
American Indian/Alaska	2%	-
Other	5%	
N = 99 N= 103		

Table 4: Occupation of Non-Rafter Respondents

Occupation		
	<u>2010</u>	<u>2012</u>
Skilled Labor	18%	27%
Service (food,	12%	13%
Professional	11%	20%
Healthcare	7%	2%
Admin/Office Worker	5%	3%
Education	4%	7%
Technical	2%	-
Other	19%	12%
Retired	21%	15%
	N = 99	N = 110

Retired Non-Rafters

2010	2012
36% skilled laborers	53% professional
23% former military	24% service/hospitality
14% in education	18% skilled laborers

Guided Rafter Questionnaire

In 2010, we interviewed 15 respondents who were on a guided rafting trip and in 2012, the number of guided rafter respondents was 30. We interviewed one person per commercial rafting trip. Thirty-seven of these respondents told us why they were in the Rogue Valley, and 38% of that group was here to see plays at the Oregon Shakespeare Festival. The rest told us they were here for vacation, passing through or visiting family and friends. The guided rafters came mostly from California (57%). Sixteen percent were from Oregon and 27% were from other states/countries.

The guided rafters were asked about the money they spent locally while in the Rogue Valley. We hypothesize that the responses were underestimates, for two reasons. First, it is often difficult to accurately represent spending when assessing it retrospectively (people frequently find it difficult to remember all the purchases they have made while on vacation). Second, some of the respondents were reticent to disclose their spending habits and we suspect they may have underestimated for social desirability reasons.

Table 5: Guided Rafters Money Spent Locally for 2010 and 2012

Raft Trip	\$ 4,368.00
Hotel	\$ 4,299.00
Camping	\$ 568.00
Restaurant	\$ 4,365.00
Groceries	\$ 1,800.00
Plane/Train	\$ 5,600.00
Entertainment	\$ 3,150.00
Car Rental	\$ 500.00
Total	\$ 24,650.00
Average/person	\$ 547.78

River Mining

We asked guided rafters open-ended questions about what makes for a pleasant experience or detracts from a pleasant experience on the river. We did not give them any prompts or categories for their answers. In general, their answers tended to center on the quality of the river rafting guide and being with their friends or family. Since these answers did not address the specifics of being on the Rogue River, we do not report on them here. However, there is one area that is specific to the Rogue. In 2010, 20% of the guided rafters stated that the presence of dredging equipment for mining along the route of their rafting trip negatively affected their experience on the river. By 2012, that percentage went up -- 43% of the guided rafters we interviewed told us that the noise and appearance of dredging detracted from their time on the Rogue.

Demographics

Below are the demographic characteristics of the guided rafters. Since we approached only one person per commercial rafting trip, the age, gender and race/ethnicity of the respondents do not necessarily represent everyone else who was a participant in the rafting trip.

Table 6: Guided Rafters Age, Gender and Race/Ethnicity

Age		
	2010	2012
18-34	40%	17%
35-54	53%	40%
55+	7%	53%
	N = 15	N = 30

Gender		
	2010	2012
Female	47%	66%
Male	53%	34%
	N = 15	N = 29

Race/Ethnicity		
	2010	2012
White/Caucasian	80%	80%
Hispanic	7%	-
Asian	13%	10%
American	-	3%
Other	-	7%
	N = 15	N = 30

Visitor Counts

In this section, we discuss river usage as determined by visitor counts. We counted 1,535 visitors total while observing the stretch of the Rogue River between Dodge Bridge and Gold Hill (see Chart 3) in Phase I. The total visitors counted in the same area for Phase II was 1,838. As Table 7 demonstrates, the most common activities were participating in commercial rafting and fishing (all types of fishing). Following closely behind the top two activities were picnicking and leisure.

Chart 3: Cumulative River Usage

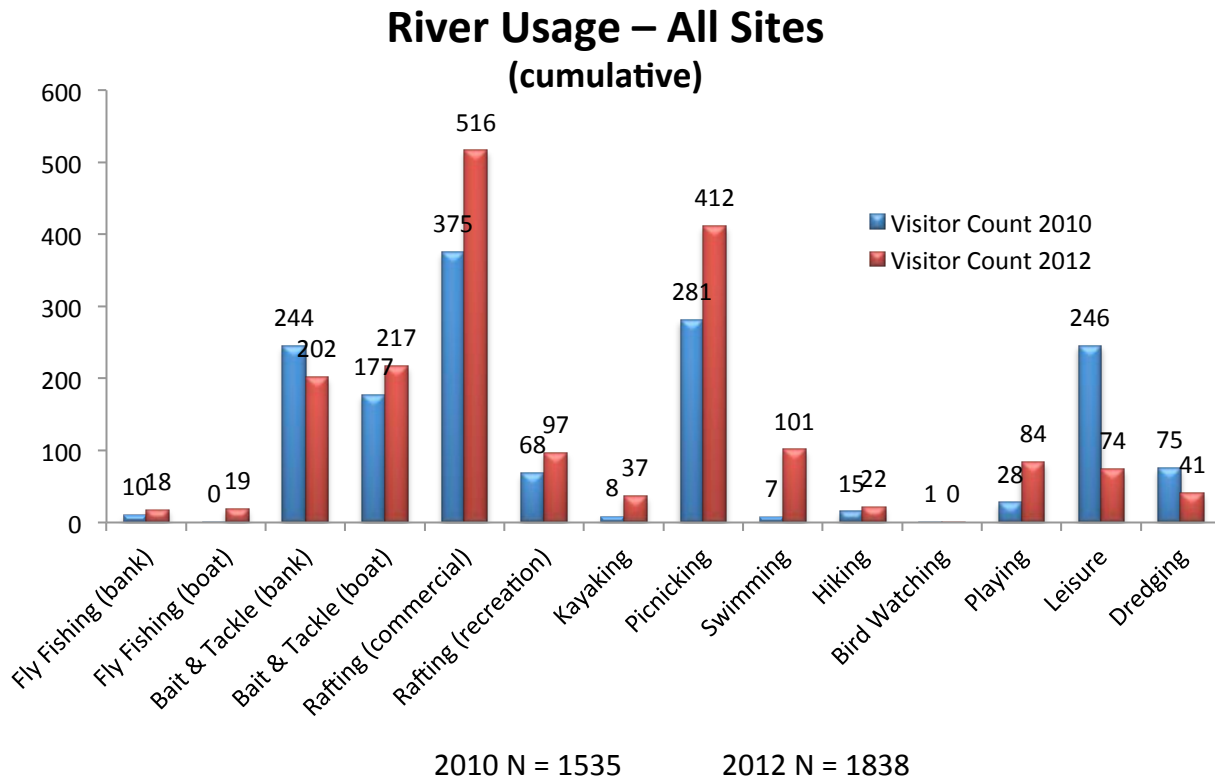


Table 7: River Activities

Top River Activities* (cumulative)		
Rafting (commercial)	24%	2010
	28%	2012
Fishing (all)	28%	2010
	25%	2012
Picnicking	18%	2010
	22%	2012
Leisure	16%	2010
	4%	2012

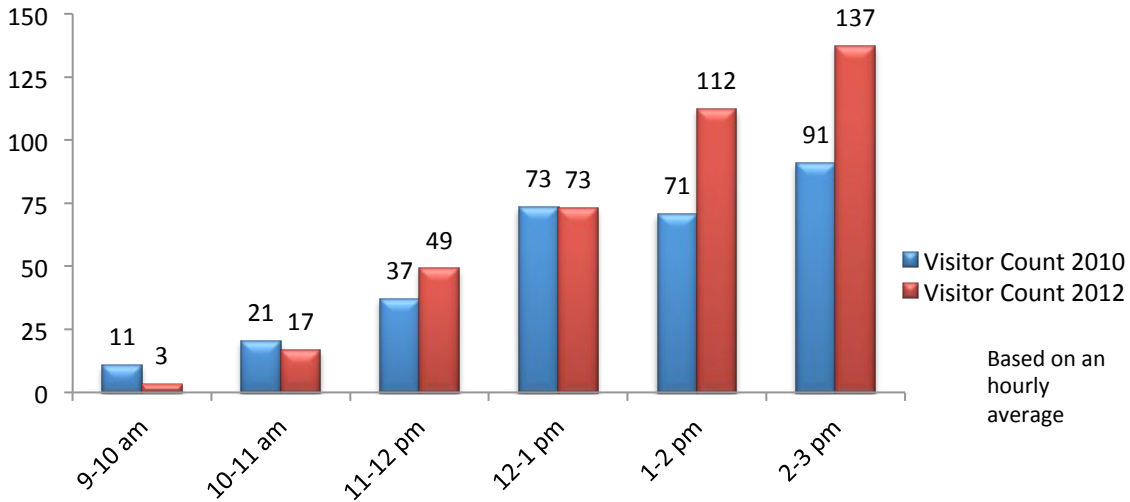
*does not = 100%

Tou Velle State Park

Two years after dam removal, recreational activity increased in all areas of Tou Velle State Park. Tou Velle is in a particularly significant location because it is the closest upriver boat ramp and park from the former GRD site. This increase ranged from more picnickers in the large picnic area in the park to more swimming in the small beach area near the boat ramp. Perhaps most indicative of the post-dam removal trends was the increase in boating that was not connected to fishing. See Table 10 for an illustration of the uptick in commercial and recreational rafting, and recreational kayaking. During the same time period, the launching of boats for bait and tackle fishing went down. Chart 6 is another demonstration of the increase in boat launches in Phase II. The 10 -11 am time period saw a dramatic shift upward and this is almost entirely due to the new commercial rafting activity, as some local rafting companies had moved their put-in location from Fishers Ferry to the Tou Velle boat ramp.

Chart 4: Tou Velle Picnic Area Activity

Hourly Activity



2010 average N = 202 2012 average N = 261

Table 8: Tou Velle Picnic Area Change in Activities

Tou Velle Top Activities		
Picnicking	77%	2010
	88%	2012
Leisure	8%	2010
	5%	2012
Playing	5%	2010
	0%	2012
Swimming	2%	2010
	4%	2012

Chart 5: Tou Velle Beach Hourly Usage

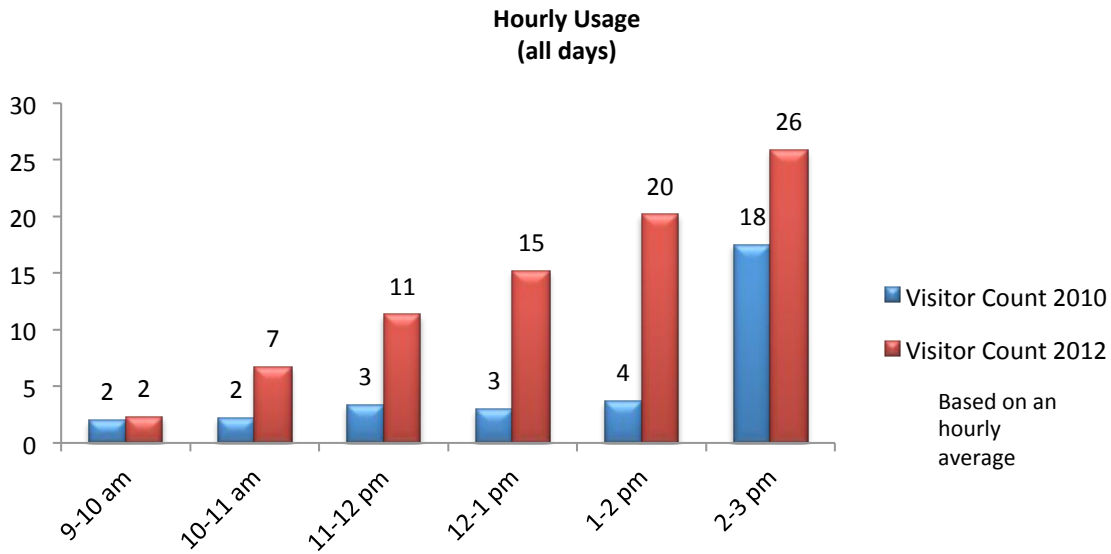


Table 9: Tou Velle Beach Change in Activities

Tou Velle Beach Top 4 Activities		
Picnicking	57%	2010
	45%	2012
Swimming	19%	2010
	36%	2012
Leisure	14%	2010
	9%	2012
Playing	8%	2010
	10%	2012

Chart 6: Tou Velle Boat Ramp Hourly Usage

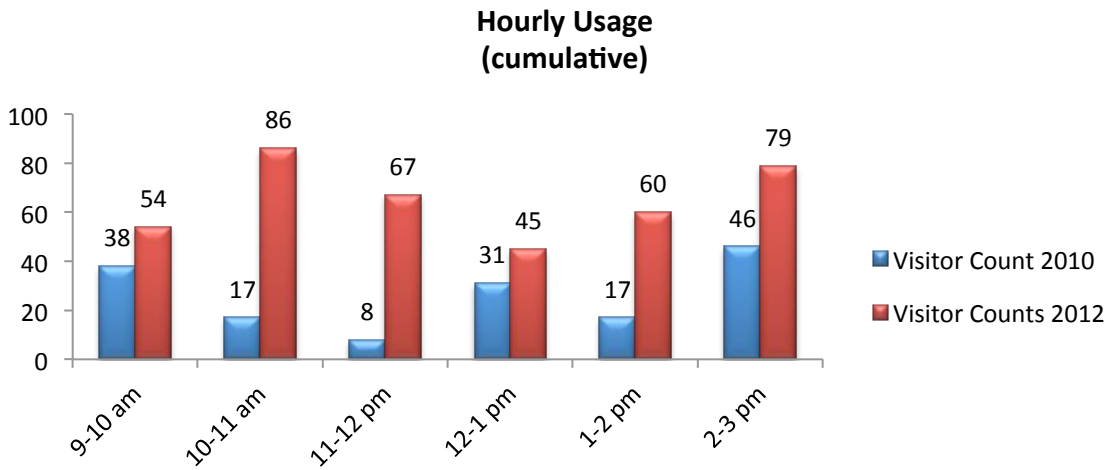


Table 10: Tou Velle Boat Ramp Change in Activities

Tou Velle Boat Ramp Top 4 Activities		
Bait & Tackle (boat)	67%	2010
	38%	2012
Rafting (commercial)	8%	2010
	29%	2012
Rafting (recreational)	8%	2010
	16%	2012
Kayacking	0%	2010
	6%	2012

Fishers Ferry, Dodge Bridge and the Nugget

Type of recreation and usage patterns also changed from 2010 to 2012 at the other field sites in the GRD area. Fishers Ferry saw reductions in bait and tackle fishing from the bank; leisure; and dredging (see Chart 7). Anglers have told us that the fish now move more quickly through the former GRD site and do not pool in specific areas as they did when the fish ladder was in place. Thus, there are fewer guaranteed areas to catch fish. Our researchers also saw fewer people engaging in leisure and we believe this is due to fewer anglers in the area. Typically those classified as pursuing leisure were accompanying anglers (e.g. someone would sunbathe or read while their friend/partner would fish). Also, dredging machines for mining were common in the summer of 2010 at Fishers Ferry as miners anticipated the dam removal. Dredging machines were moved further down river by 2012. Increased activities in the area include using a boat for bait and tackle fishing, commercial rafting, picnicking,

swimming and playing. Chart 8 displays the activities at Dodge Bridge. Since we do not have comparable data from 2010, we are including it here as a reference. We used boat trailers in the parking lot as a proxy for boat launching, so we know that the primary activities at Dodge Bridge were launching motorized or drift boats, and rafts for recreational rafting.

Chart 7: Changes in Cumulative Activities at Fishers Ferry

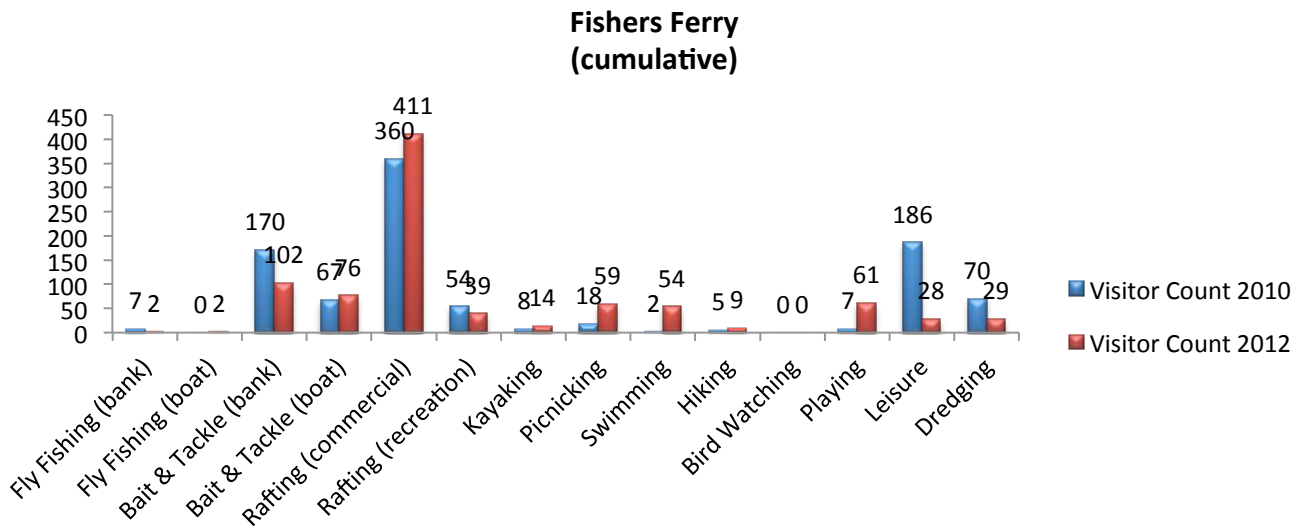
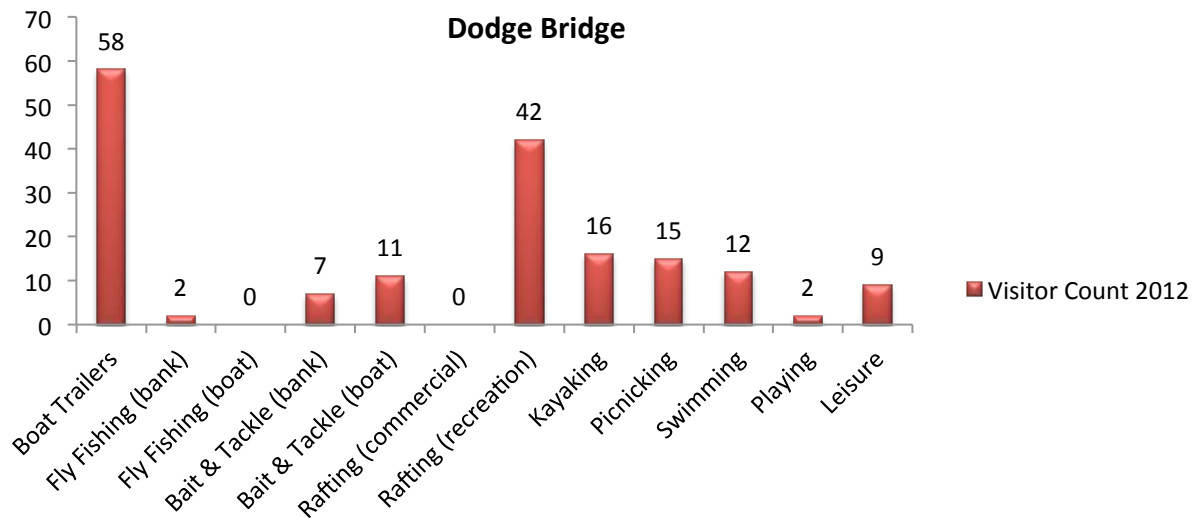


Chart 8: Activities at Dodge Bridge



Activity Site Comparison

A comparison of activities across the various field sites presents how recreation has shifted since the GRD was removed. As discussed above, we observed fewer bait and tackle anglers fishing from the bank at Fishers Ferry. Chart 9 shows the shift from Fishers Ferry to the Nugget. Although the numbers are small, Chart 10 indicates that the Tou Velle boat ramp may be seeing increased usage by anglers who are fly fishing from the bank.

One of the most important findings of this study, in terms of changes in the recreational usage and the economy of the Rogue River, is that commercial rafting has increased since dam removal. Chart 11 illustrates the upward shift in commercial rafting since 2010 as well as the shift by rafting companies toward using the Tou Velle boat ramp as new spot for river access.

Chart 9: Bait and Tackle Fishing from the Bank Compared Across Field Sites

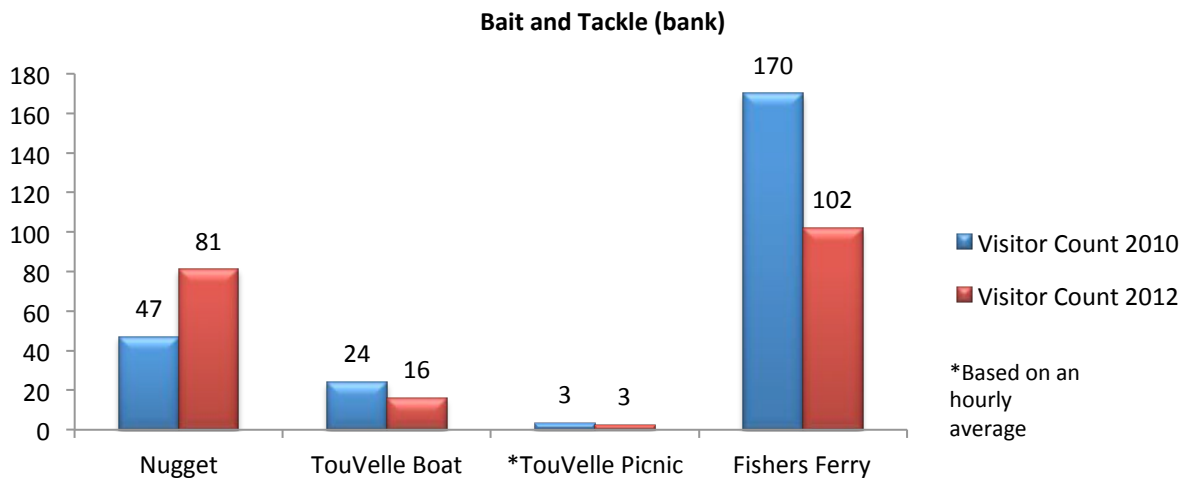


Chart 10: Fly Fishing from the Bank

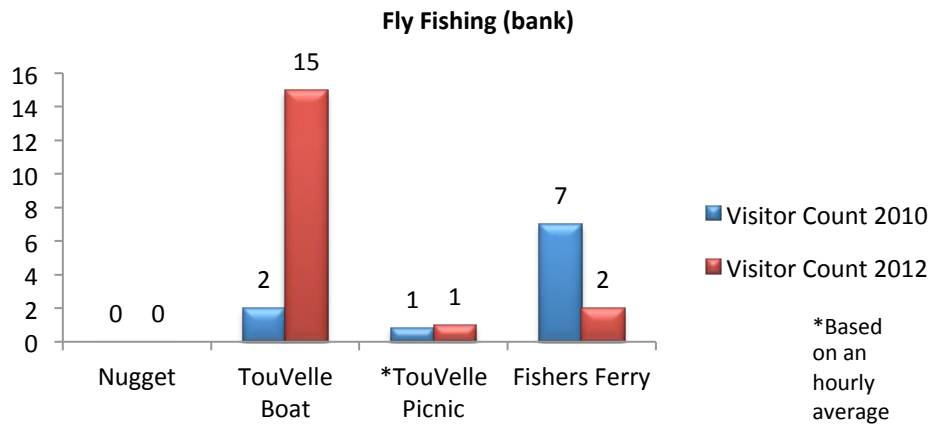
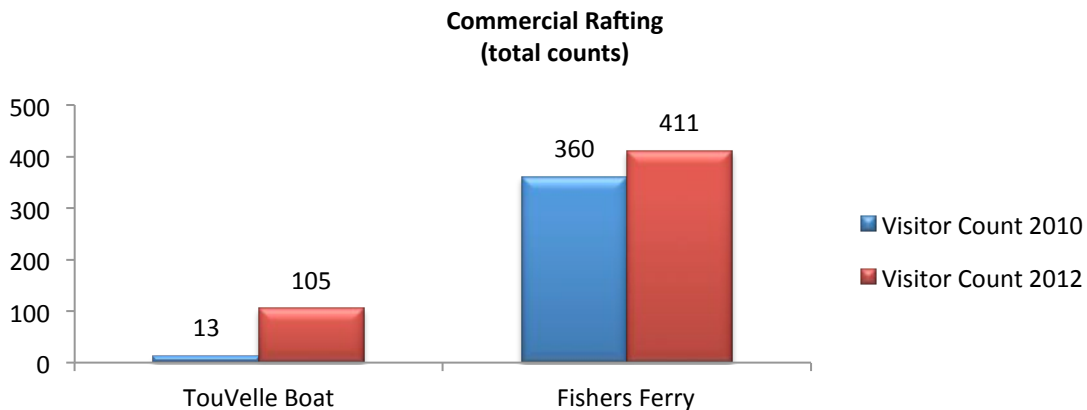


Chart 11: Commercial Rafting Compared Across Field Sites



Fishing Guides and Rafting Companies

In order to determine the economic impact of dam removal, we did baseline and follow-up interviews with fishing guides as well as selected follow-up interviews with guided rafting companies. Here we analyze whether fishing guides have changed how they conduct business on the river, whether there is a difference in the revenue they generated in 2010 compared to 2012, and how river and fishing conditions may have changed. We also report on how the major rafting companies on the Rogue have adapted to dam removal on their Nugget/Powerhouse runs.

Methodology for Fishing Guides

For 2010 and 2012, we obtained a list of registered fishing guides from the Oregon State Marine Board, and supplemented this with information from Rogue River fishing guide websites. We also employed a snowball sampling approach by asking the guides whom we interviewed to give us the names and contact information of other people who guide on the Rogue. As Table 10 indicates, we completed interviews with a similar number of guides in 2010 and 2012 were able to interview the same 43 fishing guides for both time periods. The longitudinal representation of guides, 67%, gives us a robust perspective of changes over time for this industry.

Unlike the non-rafter and guided rafter interviews, fishing guide interviews were conducted on the telephone. The fall season is a busy one for fishing guides, so phone interviews for 2012 were started around Thanksgiving to ensure that we had a sizable response rate. The decision to delay 2012 interviews until the late fall was made in as a result of the challenges faced in 2010 while trying to call guides in the late summer and early fall. Finally, those guides counted as “missing” were those whom we were unable to reach despite repeated calls.

Table 10: Overview of Fishing Guide Interviews in 2010 and 2012

		Total Respondents	
Total Listed Guides 2010	100	66	66%
Total Guides Refused	7		
Total Missing	27		
Total Listed Guides 2012	109	64	59%
Total Guides Refused	4		
Total Missing	41		
Total Interviews 2010/2012		130	
Guides Interviewed Both Years		43	
Percentage of 2012 Guides Interviewed Pre Dam Removal		67%	

Interview Findings

The complete phone questionnaire can be found in Appendix C. We asked guides about the type of guiding they did, their revenue for the previous two years, and conditions on the river. The phone interview also contained a series of open-ended questions so that fishing guides could express any concerns or comments that were not covered in the more closed-ended questions that made up the majority of the survey instrument.

There were some shifts in the predominant type of fishing by Rogue River guides. In 2012 the number of “gear” fishing guides increased by 8%, as did the number of ‘fly’ fishing guides, also increasing by 8%, while the number of guides reporting that they guide both ‘fly and gear’ fishing decreased by 16% (see Table 11). However, as seen in Tables 12 and 13, those reporting that they guided both types of fishing in 2012 were more likely to guide gear fishing (15% reporting that they guide fly fishing 60 – 90 percent of the time compared with 62% guiding gear fishing 60 – 95 percent of the time). This spread between ‘gear’ and ‘fly’ fishing guides was also the trend in 2010. With the exception of one guide in 2010, everyone we spoke to for both time periods used a boat for guiding, and slightly over half of the guides used a non-motorized boat.

Table 11: Gear vs. Fly fishing

	2010		2012	
Gear Fishing	15	22%	18	30%
Fly Fishing	12	18%	16	26%
Both	40	60%	27	44%
Total	67		61	

Table 12: Percentages of Guides Fly Fishing

	2010		2012	
5% - 40%	29	72%	16	62%
50%	6	15%	6	23%
60% - 95%	5	13%	4	15%
	40	100%	26	100%

Table 13: Percentage of Guides Gear Fishing

	2010		2012	
5% - 40%	5	13%	4	15%
50%	6	15%	6	23%
60% - 95%	29	72%	16	62%
	40	100%	26	100%

Some of the most important questions that we investigated for this research project were whether and how dam removal would affect economic activity on the Rogue. In 2010, we asked fishing guides how business had been for that year compared to business in 2009. One-third of the responses fell in the “worse” category (see Table 14). We asked the guides to tell us what factors contributed to this difference and many of them blamed decreased business on the economic downturn. Some of them indicated that assessing factors that contribute to an upward or downward trend in their business is nuanced because they have to consider a combination of the economy and the quality of the fish run. A few others stated that the unanticipated early breach of the dam caused so much turbidity that it had a negative impact on the trips they booked at the end of the summer. In 2012, when we asked guides how business had been in the past two years since the dam was removed, the responses indicated a shift upward: 31% of responses were in the “better” category. However, when asked, many of the guides were reluctant to attribute the change in business to the dam removal.

Table 14: River Guide Business Activity Compared to the Previous Year
Business Comparison

	2010 compared to 2009		2011/2012 compared to pre-removal	
Better	11	17%	19	31%
Worse	22	34%	5	8%
Same	22	34%	32	52%
Don't Know	0	0%	0	0%
Other	10	15%	5	8%
	65	100%	61	100%

To hone in more specifically on economic outcomes, during both phases of the study, we asked the guides about the number of days they took clients fishing and the revenue they had generated while on the Rogue over the last two years. These questions were a bit complicated because we wanted to delineate pre-dam removal from post-dam removal and thus when we did phone interviews in 2010, we asked about revenue generated up until dam removal. This means that the income data for 2010 included the winter, spring and summer of that year, but did not include the fall. In order to remain comparable, when we called guides in the fall of 2012, we asked for the winter, spring and summer of that year, but not the fall. For 2009 and 2011, we requested revenue generated for the entire year.

We were able to get actual revenue data and number of days on the river with clients, from most of the guides we interviewed. In Table 15, we designated the data from those interviewees as “valid”. For example, in 2010, 63 guides told us how many paid days they had on the river and 62 told us their earnings for winter, spring and summer of that year. If we only look at the “valid” data, we can see that earnings went up after the dam was removed. In 2009, 64 guides reported that they earned \$584,570; in 2010, 62 guides reported that they earned \$460,150; in 2011, 46 guides reported that they earned \$605,400; and in 2012, 48 guides reported that they earned \$500,000. We expected the dips in 2010 and 2012 because we did not ask for fall earnings for those years.

In order to have a better sense of how much overall money was generated by fishing guides on the Rogue, we need to account for the guides who would not or were not able to answer our questions regarding total earnings, or were not reached by our interviewers. We used the mean (average) of the number of days on the river and the mean revenue generated per day by those river guides for whom we had data, as an estimator for the hours and revenue of the “average” fishing guide (see Table 15). We took the number of guides missing for each year and multiplied them by that revenue/hours estimator to come up with an estimate for all of the missing guides for each year. The total revenue is the result of the valid revenue (dollar totals reported by fishing guide interviewees) plus the missing estimate (number of missing guides multiplied by the revenue estimator).

As is displayed in Table 15, when we use estimates for the missing guides, there is an even greater upward trend in total revenue in the two years after the dam was removed. We want to treat these exact total revenue numbers with some caution because we had a larger number of missing

guides in 2011 and 2012 then in the two previous years. However, we are confident of this overall upward trend in earnings.

Table 15: Fishing Guide Revenue

Differences in Fishing Guide Earnings for 2009-12

	Days 2009	Days 2010	Days 2011	Days 2012
N Valid	64	63	60	62
Missing	9	10	8	6
Mean	25.80	21.06	35.05	30.11
Minimum	0	0	0	0
Maximum	120	105	205	198
Earnings				
	2009	2010	2011	2012
N Valid	64	62	46	48
Missing	9	11	22	20
Mean	\$ 9,134	\$ 7,422	\$ 13,161	\$ 10,417
Minimum	\$ -	\$ -	\$ -	\$ -
Maximum	\$ 42,000	\$ 42,000	\$ 87,125	\$ 72,250

Total Revenue 2009-12, including missing

Year	Valid	Missing Estimate	Total
2009	\$ 584,570	\$ 82,206	\$ 666,776
2010	\$ 460,150	\$ 81,642	\$ 541,792
2011	\$ 605,400	\$ 289,542	\$ 894,942
2012	\$ 500,000	\$ 208,340	\$ 708,340

The data for 2010 and 2012 only includes information reported through August; therefore it is not surprising that the total revenues for those two years are consistently lower.

Another significant research question was whether the area used by fishing guides increased when the GRD was removed. In 2012, we asked guides if the area where they guided had increased, and if so, what new areas did they encompass? As Table 16 shows, 52 of the 64 respondents (81%) said their guiding area had increased, and the Tou Velle boat ramp to Fishers Ferry/Gold Hill stretch of the river was mentioned by nine guides as a new area they were taking clients.

Table 16: 2012 How Fishing Area Increased

	2012
Increase (did not give specifics)	24
Increase - New Take-outs	1
Increase – Tou Velle to Fishers Ferry	7
Increase – Tou Velle to Gold Hill	2
	52

After the dam was removed, we asked fishing guides (in 2012) if they had noticed any changes in the appearance and/or behavior of the fish. Of the 49 guides who responded to this question, 84% reported that they had seen a positive change in the fish – 10% citing a change in appearance, 47% noticing changes in behavior, and 27% observing changes in both. The most common changes noticed were improvement in health and vitality of the fish, suggesting that because the fish were not forced to climb the ladder at the GRD, they made it up the river in better shape, thus they were “less beat up”. Guides consistently reported that the fish were arriving earlier than in years past. They also mentioned that spawning beds and holding patterns have seemingly changed, and fish numbers have increased in some cases.

Our observations in 2010 revealed a concern about the dredging (mining) that started to occur on the Rogue in the Fisher’s Ferry area before the dam was removed, and how it might affect business on the river. We did not, however, ask any specific questions in 2010 relating to dredging, but the comments volunteered during interviews led us to include a question on the post-removal questionnaire. We found that 47% of guides in 2012 felt that dredging had affected their business. Some of the most common responses included: dredging equipment taking up large sections of the river (some people reported 20 or more dredges in one area of the river) making it difficult to navigate, competing for space, concerns about turning up spawning beds, and overall disturbance of the environment (see Table 17). Fifty-three percent of the guides reported that they were not affected or were unsure if the dredging was affecting their business. In many of these cases the fishing guides did not fish the areas that were being mined, and rarely encountered the miners or dredging equipment.

Table 17: Has Increased Dredging Affected Fishing Guide Business?

	2012	
Yes	21	47%
No	15	33%
Unsure	9	20%
	45	100%

Our research team wondered if removing the dam would change areas perceived as crowded or would increase conflict among river users. We asked guides in both 2010 and 2012 whether they encountered conflict and crowding on the river. The answers we heard were consistently anchored in issues between bank anglers and boat anglers, with a few other concerns around snagging and crowding. In 2012 the guides brought a new issue about jet boaters, now that there is greater access for jet boats in that part of the river.

Additional Comments from the Guides

Before concluding the interview we asked the guides if there was anything else that affected their business that we did not cover, and they had positive and negative comments about how dam removal impacted them. Positive assessments included that it was best for the health of the river, opened up new sections to fish, cooled the river down and cleaned it out, and that the overall fishing has improved. Negative responses addressed the following concerns: mud and silt has made the area hard to fish and hard on boat engines, there are new hazards and gravel build-up, overcrowding at Fishers Ferry, there is no fish count and there needs to be better regulations of the dredging.

Changes for Rafting Companies

The Power House class IV and Nugget Falls class III+ rapids are a lucrative section of the Rogue River for guided rafting companies. This section starts below Fishers Ferry, and as discussed in the visitor count analysis above, provides a great deal of business for commercial rafting companies. With the removal of the dam and the resulting increased accessibility of the river, we had hypothesized that rafting companies would change their put-in points and offer a wider variety of trips to customers. In 2010, we interviewed a number of the larger companies about these anticipated changes and some of them were enthusiastic about introducing new river runs. Two years after dam removal, we contacted

the four largest utilizers of the Nugget/Power House stretch to ascertain whether and how river usage had changed.

We chose to interview the business owners of the commercial rafting companies that had the greatest presence on the Nugget/Power House section of the Rogue during the summers of 2010 and 2012. These companies range from one that rafts that section of the Rogue exclusively to one that runs trips all over the West, but still uses the upper Rogue a great deal. Combining the estimates from just these four companies for their upper Rogue rafting trips gives a total of at least 4,660 clients for the summer of 2012. This is an underestimate because there are other companies that do run the upper Rogue, but not as frequently.

When asked whether the dam removal has changed their business, all of the companies told us that it had not. However, when asked more specifically about the rafting trips offered, it became clear that dam removal had contributed to increased opportunities: one company has introduced a new “scenic float” that puts in at Tou Velle and takes out at Fishers Ferry and two other companies have new runs that put-in at Dodge Bridge and take-out at the Gold Hill Sports Park. These are relatively new changes and we suspect that follow-up in a year or two would reveal how much these runs generate new business.

We asked the rafting companies for additional comments about this section of the Rogue. Two of the business owners spoke about Fishers Ferry, indicating that it would make a significant difference if the ramp and parking area were improved. One person stated that, “Lyman’s has a lot of potential”, another suggested more put-ins and take-outs on that stretch of the river, and a third person noted that there are no restrooms at Nugget, but it is a heavily utilized area.

Three of the four commented on the negative impact of dredging along this section of the river. One company owner said that customers frequently commented on the noise that came from the dredging machines; he assessed it in this manner, “Mining impacts the quality of the trips that we offer, but doesn’t impact the bottom line.” Another owner presented a different view, saying that there was noise and air pollution from the dredging motors and said that “customers won’t go on the trip again, they (dredging machines) detracted from their experience.” A third owner told us that dredgers are “a concern of mine” and that there needs to be “more enforcement”.

Conclusion

Visitor counts, and interviews with recreational users, fishing guides and commercial rafting companies, reveal changes in recreational and economic patterns after the Gold Ray Dam was removed. Data collected from various field sites above and below the former dam location show a shift in the rates of activities and the utilization patterns of the river. During the second phase of our study, we observed more commercial rafting, private rafting and kayaking on the Rogue, and a greater usage of Tou Velle State Park. While Fishers Ferry continues to be a popular put-in site for commercial rafting, we saw less recreational use in that area. In specific, anglers appeared to have moved to other nearby parts of the river, along with those engaged in leisure activities. Interviews with fishing guides resulted in multiple measures of increased business after the dam was removed: guides assessed that their business was better and the revenue they reported to us was higher (when accounting for missing fishing guides, post-dam revenue for guides was substantially higher). Fishing guides also indicated positive changes in fish appearance and behavior. Rafting companies stated that their business remained stable after the GRD was removed. Three of the four commercial rafting companies we spoke with have introduced new rafting trips that begin above the former dam site.

We suspect that these recreational and economic changes will persist and perhaps become even more pronounced as river users, fishing guides and commercial rafting companies continue to adapt to the new configuration of the Rogue. Further investigation in the next few years would measure the persistence of these changes. If funding were available for future research, SOURCE would like to do a follow-up study of riverfront property values in addition to a longer-term assessment of recreational and economic changes on the river.

Appendix A

Non-rafter Questionnaire

Location of survey: Shady Cove GRD Site_____ Date_____

Interviewer Name _____

Current recreational activity _____ (if fishing, bank or boat?)

I'm a student at SOU and am part of the research team that is analyzing the economic and recreational impact of the removal the Gold Ray Dam. We are studying how people use the middle part of the Rogue River for recreation. I have a very short survey for people using the river. It is an **anonymous and voluntary** survey and will take 5 – 8 minutes of your time.

1) Is this your first time on the Rogue? Y_____ N _____

2) Where are you from? _____ **(first time visitors go to question 9)**

3) We would like to know about the activities you enjoy on the Rogue River. Please tell me which activities you engage in, how many times you have done them in the past 12 months, how long you have been enjoying these activities on the Rogue, in which season you do them, and any other parts of the River you do the same activity.

Activity	# in last 12 mos.	How many years?	Spring	Summer	Fall	Winter	Which parts of the Rogue do you do these activities?
Fly Fishing (answer Q.3a & 3b)							Upper Mid Lower
Bait and Tackle Fishing (boat or bank?) (answer Q.3a & 3b)							Upper Mid Lower
Rafting commercial or not?							Upper Mid Lower
Canoeing							Upper Mid Lower
Birding							Upper Mid Lower
Picnicking							Upper Mid Lower
Leisure (what?)							Upper Mid Lower
Kayaking							Upper Mid Lower

Boating							Upper Mid Lower
							Upper Mid Lower

Upper: Fish Hatchery to Shady Cove **Mid:** Shady Cove to Gold Hill **Lower:** Gold Hill to the Ocean

3a) Have you noticed any changes in the appearance of the fish since the dam was removed?

Yes _____ No _____ Don't Know _____

If yes, please describe

3b) Have you noticed any changes in the behavior of the fish since the dam was removed?

Yes _____ No _____ Don't Know _____

If yes, please describe

4) Does river flow affect your activity?

Yes _____ If yes, how? _____
 No _____ if no, skip to question 6.

5) What is your ideal river flow?

CFS _____ Very High High Moderate Low Very Low

6) Do you participate in guided activities on the Rogue? (e.g., rafting, fishing)

Yes _____ No _____ (if no, please skip to question 9)

7) How often do you sign up for guided trips on the Rogue River in a year?

Less than 1 1-2 3-4 4-6 More than 6

8) How much do you spend on average for those guided trips? _____

9) Are you renting any equipment for your activities today? (Please indicate for both)

Own _____ Rent _____ Amount \$\$ for rentals _____
Where did you rent the equipment? _____

10) Did you purchase items such as food or gas nearby (Gold Hill/Shady Cove) during your visit today?

Yes _____ No _____ (if no, please skip to question 12)

11) Approximately how much did you spend on those food items?

Less than \$10 \$10-\$20 \$21-40 \$41-60 \$61-80 >\$80

12) How long did it take, from where you live, to get to the Rogue River? _____

13) If it took you **more than 3 hours** to get to the river, which of the following types of business have you used during your stay? (otherwise skip to question 15)

		Amount \$\$ Spent
Camping	<input type="checkbox"/>	_____
Hotels/Lodging	<input type="checkbox"/>	_____
Restaurant	<input type="checkbox"/>	_____
Grocery	<input type="checkbox"/>	_____
Car Rental	<input type="checkbox"/>	_____
Plane/Train	<input type="checkbox"/>	_____
Bus/Charter Bus	<input type="checkbox"/>	_____
Entertainment	<input type="checkbox"/>	_____
Recreation	<input type="checkbox"/>	_____

14) Was your primary reason for coming to the area to engage in river recreation?

Yes _____ No _____

If no, what was your primary reason? _____

15) What makes for an enjoyable experience on the river?

16) What detracts from that experience?

17) Describe any specific problems you have had on the river. (e.g., noise, conflicts, crowding, etc.)

18) What age category are you in?

18-24 25-34 35-44 45-54 55-64 65-74 75+

19) What is your occupation? _____

20) If you are retired, what was your occupation? _____

21) What race/ethnicity do you identify with?

White/Caucasian

Hispanic

Asian

American Indian/Alaska Native

Black/African American

Native Hawaiian/Pacific Islands

Other

Interviewer fills out

G _____

Appendix B

Guided Rafter Questionnaire

Location of survey: Shady Cove GRD Site _____ Date _____
Interviewer Name _____

I'm a student at SOU and am part of the research team that is analyzing the economic and recreational impact of the removal the Gold Ray Dam. We are studying how people use the middle part of the Rogue River for recreation. I have a very short survey for people using the river. It is an **anonymous and voluntary** survey and will take 5 – 8 minutes of your time.

- 1) Is this your first time on the Rogue? Y _____ N _____
- 2) How much did you pay for your rafting trip today? _____
- 3) Where are you from? _____
- 4) How far away is that from the rafting company you are using? _____ **If more than 3 hours**, go to next question, **for locals**, go to question 7 on next page.
- 5) If it took you **more than 3 hours** to get to the river, which of the following types of business have you used during your stay?

		Amount \$\$ Spent
Camping	<input type="checkbox"/>	_____
Hotels/Lodging	<input type="checkbox"/>	_____
Restaurant	<input type="checkbox"/>	_____
Grocery	<input type="checkbox"/>	_____
Car Rental	<input type="checkbox"/>	_____
Plane/Train	<input type="checkbox"/>	_____
Bus/Charter Bus	<input type="checkbox"/>	_____
Entertainment	<input type="checkbox"/>	_____
Recreation	<input type="checkbox"/>	_____

6) Was your primary reason for coming to the area to engage in river recreation?

Yes _____ No _____

If no, what was your primary reason? _____

If first time on Rogue, skip to question 13 on page after next. For repeat visitors, continue on.

7) We would like to know about other activities you enjoy on the Rogue River. Please tell me which activities you engage in, how many times you have done them in the past 12 months, how long you have been enjoying these activities on the Rogue, in which season you do them, and any other parts of the River you do the same activity.

Activity	# in last 12 mos.	Since what year?	Spring	Summer	Fall	Winter	Which parts of the Rogue do you do these activities?
Fly Fishing (answer Q.7a & 7b)							Upper Mid Lower
Bait and Tackle Fishing (boat or bank?) (answer Q.7a & 7b)							Upper Mid Lower
Rafting - commercial or not?							Upper Mid Lower
Canoeing							Upper Mid Lower
Birding							Upper Mid Lower
Picnicking							Upper Mid Lower
Leisure (what?)							Upper Mid Lower
Kayaking							Upper Mid Lower
Boating							Upper Mid Lower
							Upper Mid Lower

Upper: Fish Hatchery to Shady Cove **Mid:** Shady Cove to Gold Hill **Lower:** Gold Hill to the Ocean

7a) Have you noticed any changes in the appearance of the fish since the dam was removed?

Yes _____ No _____ Don't Know _____

If yes, please describe _____

7b) Have you noticed any changes in the behavior of the fish since the dam was removed?
Yes _____ No _____ Don't Know _____

If yes, please describe

8) Does river flow affect your activity?
Yes _____ If yes, how? _____
No _____ if no, skip to question 10.

9) What is your ideal river flow?
CFS _____ Very High High Moderate Low Very Low

10) Have you participated in guided activities on the Rogue? (e.g., rafting, fishing)
Yes _____ No _____ (if no, please skip to question 13 on the next page)

11) How often do you sign up for guided trips on the Rogue River or other rivers in a year?
Less than 1 1-2 3-4 4-6 More than 6

12) How much do you spend on average for those guided trips? _____

13) What makes for an enjoyable experience on the river?

14) What detracts from that experience?

15) Describe any specific problems you have had on the river. (e.g., noise, conflicts, crowding, etc.)

16) What age category are you in?
18-24 25-34 35-44 45-54 55-64 65-74 75+

17) What is your occupation? _____

18) If you are retired, what was your occupation? _____

19) What race/ethnicity do you identify with?

White/Caucasian

Hispanic

Asian

American Indian/Alaska Native

Black/African American

Native Hawaiian/Pacific Islands

Other

Interviewer fills out

G _____

Appendix C

Fishing Guide Post-Removal Questionnaire

1. Did you receive a letter from us? ___ yes ___ no
2. Did we interview you before the dam was removed? ___ yes ___ no
3. Have you guided any trips on the Rogue River, anywhere from Shady Cove to Gold Hill in the last two years? ___ yes ___ no (if no, stop the interview)
4. What kind of fishing do you guide? Gear fishing, fly fishing or both?
___ gear fishing ___ fly fishing ___ both, if both what percentage do you do ___ % fly and what percentage do you do ___ gear%
5. Do you use a boat? ___ yes ___ no
- 5a. Is it motorized? ___ yes ___ no

We're just focused on the area of the Rogue between Shady Cove and Gold Hill, so please keep that in mind when you answer the rest of the questions.

6. How does your business compare from before the dam was removed to the past two years since?

We need to get a concrete idea of your business for last year and this year.
ENCOURAGE GUIDE TO GET CALENDAR OR PAPERWORK IF NECESSARY.

7. How many paid days did you have guiding from Shady Cove to Gold Hill on the Rogue River in Winter, Spring, Summer and Fall of 2011? _____ days ___ **actual** ___ **estimate**
 - 7a. How many of those were full paid days? _____ full-paid days ___ **actual** ___ **estimate**
 - 7b. How many of those were half paid days? _____ half paid days ___ **actual** ___ **estimate**
8. How many paid days did you have on that part of the Rogue for the Winter, Spring and Summer of this year, 2012? _____ days ___ **actual** ___ **estimate**
 - 8a. How many of those were full paid days? _____ full-paid days ___ **actual** ___ **estimate**
 - 8b. How many of those were half paid days? _____ half paid days ___ **actual** ___ **estimate**
9. How much, on average, do you charge per person? \$ _____
Typical # of people per boat? _____
- 9a. Is that a half day or full day price? ___ half ___ full
10. Do you think dam removal has affected your business in the past two years?
___ yes ___ no
- 10a. (If yes) How?
11. Has the opening up of the GRD section increased the area where you guide?
___ yes ___ no
- 11a. (If yes) How?

12. Have you noticed a difference in the appearance and/or behavior of the fish since the removal of the dam?

yes no

12a. (If yes) How?

13. Has the increased dredging on the river affected your business?

I want to ask you just a few questions about crowding and conflict on the mid to upper Rogue.

14. For 2012, how often did you find that the spots you take customers to fish are too crowded for your customer to fish?

most of the trips you guide

about half the trips guide

a few of the trips you guide

none of the trips you guide

15. For 2012, how often did you have to deal with conflict with other people fishing when you are guiding customers?

most of the trips you guide

about half the trips guide

a few of the trips you guide

none of the trips you guide

16. What type of conflict occurs?

17. Is there anything you feel that affects your guiding that we did not cover?