Lower Clark Fork River Angler Creel Survey – 2015

Noxon Rapids Reservoir, Cabinet Gorge Reservoir, and Bull River

Project Completion Report

Montana Tributary Habitat Acquisition and
Recreational Fishery Enhancement Program
Appendix B

June 2017

P.O. Box 3727
Spokane, Washington 99230-3727

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Prepared by:

Jason Blakney
Fisheries Biologist
Montana Fish, Wildlife and Parks
Thompson Falls, MT

Ryan Kreiner
Fisheries Biologist
Montana Fish, Wildlife and Parks
Thompson Falls, MT

and

Tim Tholl
Natural Resource Technician
Avista Corporation
Noxon, MT

Prepared for:

Avista
Noxon, Montana
and

Montana Fish, Wildlife and Parks

Helena, Montana

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Summary

The establishment of diverse, multispecies sportfisheries over the last 30 years in the lower Clark Fork River drainage in Montana has led to a tremendous increase in fishing pressure, especially on Noxon Rapids Reservoir (Noxon Reservoir). Given the popularity of these fisheries, an in-depth angler creel survey was conducted from April through November 2015, on three waterbodies in the lower Clark Fork River drainage, Montana; Noxon Reservoir, Cabinet Gorge Reservoir, and the Bull River. To characterize the current recreational fisheries, this survey evaluated angling pressure, catch rates, harvest, angler preferences, and angler demographics. One of the main objectives for the surveys on the Bull River and Cabinet Gorge Reservoir was to investigate and provide baseline data on the experimental passage of Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* above Cabinet Gorge Dam on the recreational fisheries.

Noxon and Cabinet Gorge reservoirs support unique and diverse fish communities that contain coldwater, coolwater and warmwater fish species. The majority of anglers in 2015 targeted non-native sportfish with Northern Pike *Esox Lucius*, Smallmouth Bass *Micropterus dolomieu*, and Yellow Perch *Perca flavescens* being the top three species targeted by anglers on both reservoirs. Anglers that targeted Smallmouth Bass, Largemouth Bass *M. salmoides* or both species comprised 30-40% of fish community targeted by anglers on both reservoirs. Eighty-five percent of the 1,324 angling parties interviewed on Noxon Reservoir were Montana residents, while 68% of the 228 parties interviewed on Cabinet Gorge Reservoir were Montana residents. Boat anglers comprised the majority of angling parties interviewed on both reservoirs. Surveyed parties caught nearly 11,500 fish representing 15 different species on Noxon Reservoir, while over 900 fish of 12 different species were documented to have been caught on Cabinet Gorge Reservoir. Yellow Perch represented the highest proportion of angler catch as well as the highest catch rates (fish/hr) on both reservoirs. Walleye *Sander vitreus* harvest was much higher than what was observed for other gamefish species, with nearly identical harvest rates between reservoirs. A very limited number of angler interviews were obtained on the Bull River and it is believed that an active fire season, associated closures, and limited public access facilitated the light fishing pressure encountered. Little information on the impact of experimental Westlope Cutthroat Trout passage on the fisheries was obtained as no tagged fished were reported to have been captured.

Aircraft were used to conduct instantaneous angler counts across the duration of the creel survey. Flight count data along with other variables were used to estimate angling pressure and were compared with estimates produced from Montana Fish, Wildlife and Park's random mail-in surveys. Estimates of total fish caught by species and angler type over the surveyed period were developed for Noxon Reservoir. Species-specific information obtained from this creel survey was paired with data from reservoir monitoring data and from other regional creel surveys where applicable.

Introduction

The fishery and fish community have drastically changed in the lower Clark Fork River (LCFR), Sanders County, northwest Montana, over the past century. Prior to 1910, the free-flowing river was a migratory corridor for large runs of native salmonids including Bull Trout *Salvelinus confluentus*, Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* and Mountain Whitefish *Prosopium williamsoni* (Pratt and Huston 1993). It is believed that many of these native salmonids spent much of their adult life foraging in Lake Pend Oreille (LPO), Idaho and used the river as a migratory corridor to access natal tributaries across western Montana. The lower river's residents at this time were mainly believed to be native cyprinid and catostomid species along with Mountain Whitefish (Huston 1985). Three hydroelectric dams were built on the mainstem lower Clark Fork River in the early and middle 20th century. These dams impounded the river and created present mainstem reservoirs: Thompson Falls Reservoir (completed in 1915), Noxon Rapids Reservoir (hereafter, Noxon) (1959), and Cabinet Gorge Reservoir (1953). With the creation of novel lentic habitats, fisheries professionals recognized the potential to establish these waterbodies as sportfisheries. To set the stage for the introduction of sportfish, a large portion of the river was chemically treated to rid its waters of undesirable, native non-game fish species in 1959 (Huston 1965). From the early 1950s through the early 1980s numerous attempts were made to convert the reservoirs into salmonid fisheries (Huston 1985). The most effort was put into the establishment of Rainbow Trout *O. mykiss* fisheries; however, a variety of other salmonids were stocked at varying sizes, from fry reared in tributary streams to catchable-sized fish (Huston 1965, 1985). These species included Brown Trout *Salmo trutta*, Westslope Cutthroat Trout, Yellowstone Cutthroat Trout *O. clarki bouveri*, Kokanee Salmon *O. nerka* and Coho Salmon *O. kisutch* (Huston 1965, 1985). Efforts to establish sustainable salmonid sportfisheries were largely unsuccessful, notwithstanding the effort of past resource managers and stakeholders.

Due to seasonally warm water temperatures, lower Clark Fork River reservoirs are much better suited to non-native cool and warmwater species, than to the coldwater salmonids. With the stabilization of reservoir fluctuations related to hydroelectric operations in the late 1970s through the mid-1980s, successful fisheries began to emerge. Largemouth Bass *Micropterus salmoides* and Yellow Perch *Perca flavescens* were present in the system prior to impoundment but occupied limited habitat patches with no notable fisheries (Huston 1965, 1985). Northern Pike *Esox Lucius* were illegally introduced into the Flathead River system in the 1950s and first appeared in Noxon Reservoir in 1972 and Cabinet Gorge in 1974 (Huston 1985). Populations of these three gamefish benefited with stabilization of reservoir levels as their spawning and rearing habitats are closely tied to shallow and weedy littoral areas. Smallmouth Bass *M. dolomieu* were first stocked in Noxon Reservoir in 1982 and by 1984 were distributed throughout the reservoir and in Cabinet Gorge Reservoir as well (Huston 1985). Walleye *Sander vitreus* were first discovered in Noxon Reservoir in 1994 (WWP 1995) and were also the product of an illegal introduction. A recent study that analyzed 15 years of reservoir monitoring data described a fish

community in transition from a native forage-species dominated assemblage to one increasingly dominated by non-native predatory species (Scarnecchia et al. 2014). Today, the five gamefish species mentioned above comprise the vast majority of species targeted by anglers on Noxon and Cabinet Gorge reservoirs.

Several native and non-native salmonid species currently occur in lower Clark Fork River impoundments at very low abundance. These include Bull Trout, Westslope Cutthroat Trout, Mountain Whitefish, Rainbow Trout, Brown Trout, Brook Trout *Salvelinus fontinalis*, Lake Whitefish *Coregonus clupeaformis,* and Lake Trout *S. namaycush*. Native non-game fish species present include Peamouth *Mylocheilus caurinus*, Northern Pikeminnow *Ptychocheilus oregonensis*, Largescale Sucker *Catostomus macrocheilus*, Longnose Sucker *C. catostomus* and Redside Shiner *Richardsonious balteatus*. Other introduced fish species that occur in the reservoirs include Black Bullhead *Ameiurus melas*, Yellow Bullhead *A. natalis* and Pumpkinseed Sunfish *Lepomis gibbosus*.

The establishment of diverse, multispecies sportfisheries over the last 30 years has led to a tremendous increase in fishing pressure in the lower Clark Fork, especially on Noxon Reservoir. In 1982, fishing pressure on Noxon Reservoir was estimated at about 800 angler days per year (Montana Fisheries Information System-MFISH) and by 2013 rose to a record high of nearly 33,000 angler days per year (MFWP 2014). The most recent pressure estimates were conducted in 2015 showed over 26,000 angler days on Noxon Reservoir and 7,000 on Cabinet Gorge Reservoir (MFWP, unpublished data). Noxon Reservoir is currently ranked 3rd in Montana Fish, Wildlife and Park's (MFWP) Region 1 and 31st statewide for angling pressure across all waterbodies (MFWP, unpublished data). Given the popularity of the lower mainstem Clark Fork fishery, an in-depth creel survey was warranted.

In recent decades, angler creel surveys have been conducted in the lower Clark Fork River drainage. An angler creel survey was performed on Noxon and Cabinet Gorge reservoirs from May through October 1994; however, very light fishing pressure was encountered with only 31 interviews conducted on Noxon Reservoir and seven on Cabinet Gorge Reservoir over a six-month period (NDT 1995). In the winter of 2011 and 2012, an ice fishing creel survey collected over 1,200 interviews on Noxon, Cabinet Gorge and Thompson Falls reservoirs as well as two nearby small sub-impoundments (Kreiner 2013).

This report outlines a creel survey conducted April through November 2015, on three waterbodies in the lower Clark Fork River drainage, Montana; Noxon Reservoir, Cabinet Gorge Reservoir and the Bull River. To characterize the recreational fishery, this survey sought to determine and evaluate angling pressure, catch rates, harvest, angler preferences and angler demographics. On the Bull River and Cabinet Gorge Reservoir, a separate objective was to evaluate the passage of a select number of Westslope Cutthroat Trout above Cabinet Gorge Dam on the recreational fishery, initiated in 2015.

Methods

Study area

The LCFR in northwest Montana begins at the confluence with the Flathead River near Paradise, Montana and continues downstream to LPO in Idaho. In the early 1900s, the first of three power generating dams was constructed across the LCFR which restricted migrations of native fish and altered the physical characteristics of the waterbody. The most upstream of the three dams, Thompson Falls Dam, located near the town that bears its namesake, was built in 1913 and created Thompson Falls Reservoir. This impoundment is the smallest of the three LCFR reservoirs at about 352 hectares with a maximum depth of around 21 meters and is currently owned and operated by Northwestern Energy. Approximately 61 kilometers downstream near the town of Noxon; Noxon Rapids Dam creates Noxon Reservoir, the largest of the mainstem impoundments with a surface area of 3,177 hectares, and a maximum depth of greater than 61 meters (Figure 1). Finally, just inside the Idaho border, Cabinet Gorge Dam creates Cabinet Gorge Reservoir that is 1,153 hectares, approximately 30 kilometers in length, with a maximum depth of 51 meters (Figure 2). Both Noxon Rapids and Cabinet Gorge dams were built in the 1950s and are currently owned and operated by Avista. All three impoundments are considered mainstream or run-of-the-river reservoirs (Kalff 2002). Thus, the reservoirs retain both lotic and lentic characteristics. Noxon Reservoir is essentially divided into two distinct habitat types. The upper portion of Noxon Reservoir (35 km), from Thompson Falls Dam downstream to Beaver Creek Bay is more riverine and much of this section is characterized by a narrow, U shaped channel around 300 meters wide with visible current. The lower reservoir (26 km), is wider and visually more lentic in appearance with more extensive littoral zone and an average width of over 1000 meters (Huston 1985). Cabinet Gorge Reservoir is typified by a deep, narrow channel with smaller, shallow bays and shoals, but not to the extent observed in lower Noxon Reservoir.

The Bull River is the largest tributary to Cabinet Gorge Reservoir, entering from the north (Figure 2). A fourth order stream about 40 kilometers in length, the Bull River drains the high peaks of the southern portion of the Cabinet Mountain Wilderness and has two distinct channel types. Native and non-native salmonids comprise the majority of the fish community in the river, with the East Fork Bull River being critical habitat for Bull Trout (Moran and Storaasli 2015). The lower and upper portions of the mainstem Bull River and the fish bearing portions of its tributaries are classified as B and C (Rosgen 1996) channels typically found in mountain valleys of the western United States. Much of the mainstem channel is characterized as an E type (Rosgen 1996) channel from above its confluence with the East Fork upstream to just below the confluences of the North, Middle and South Forks. The river in this section is deep, slow and sinuous. While much of the uplands and tributaries lie on public land administered by the U.S. Forest Service, most of the land bordering the mainstem Bull River is privately owned.

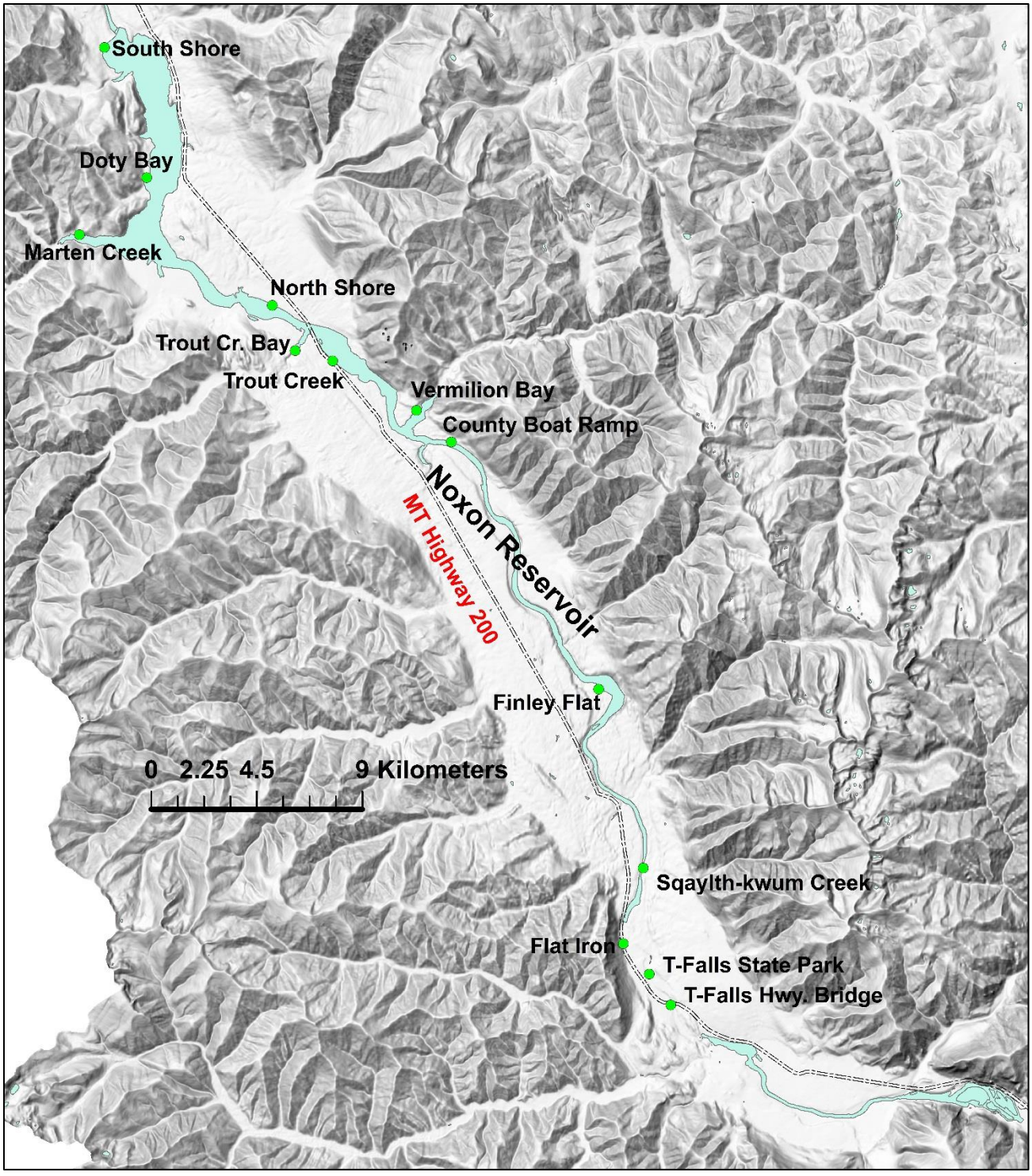

FIGURE 1. Angler access locations where creel interviews were conducted on Noxon Reservoir in 2015.

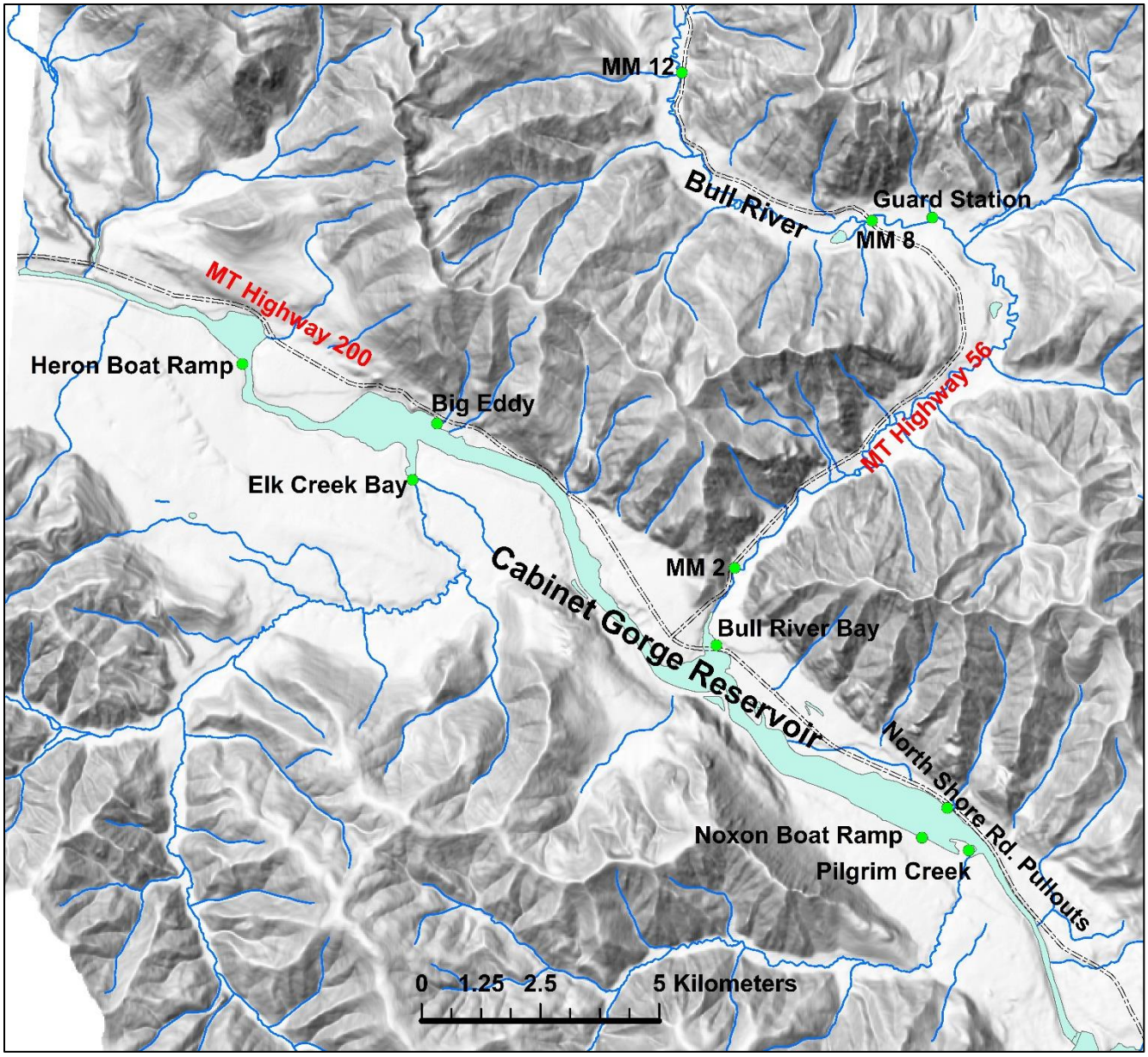

FIGURE 2. Angler access locations where creel interviews were conducted on Cabinet Gorge Reservoir and the Bull River in 2015. Mile markers (MM) are denoted for Bull River-MT Highway 56 access locations.

Sampling stratification for angler surveys

Surveys were conducted by two full-time creel clerks from the beginning of April through the end of November on the three lower Clark Fork waterbodies. One clerk worked from the beginning of April through the end of October and a second clerk worked from the beginning of May through the end of November. Clerks worked eight-hour daily shifts during the months of April, September, October, November and 10 hour daily shifts from May through August to cover the longer summer daylight hours. Clerks did not interview anglers associated with fishing

tournaments. Results of this study were analyzed and reported in six-week increments referred to in this document as a "period", based on an *a priori* perception of angling pressure (low, moderate, high). The five periods were: April 1 through May 15 (low), May 16 through June 30 (moderate), July 1 through August 15 (high), August 16 through September 30 (high) and October 1 through November 30 (low).

A stratified random sampling design was employed where surveys were stratified by waterbody, start location, and time of day, and period. The waterbody, start location and time of day were assigned randomly on a monthly basis. Sampling locations on Noxon Reservoir were stratified by geographic location (i.e., north shore vs. south shore). To maximize angler interviews, a roving creel survey methodology was used (Malvuesto 1983). Creel clerks attempted to measure all harvested fish which were measured to the nearest inch in the field and converted to millimeters for this report. Instantaneous angler counts were conducted via fixed-wing aircraft.

Strata explanation

We allocated 75% of possible days of sampling effort to Noxon Reservoir with the remaining 25% of days spent on Cabinet Gorge Reservoir and the Bull River (Table 1). Justification for the increased sampling on Noxon Reservoir was based on past angler-use data (Figure 3) and professional judgment. Angling pressure estimates from MFWP's mail-in questionnaires for Noxon Reservoir were estimated at 32,848 angler days in 2013 and 26,301 angler days in 2015 (MFWP 2014, MFWP unpublished data) (Figure 3). Cabinet Gorge Reservoir was estimated to have received 1,869 and 7,180 angler days in 2013 and 2015 respectively, while the Bull River was estimated to have received 2,182 angler days in 2013 and 2,056 angler days in 2015 (MFWP 2014, MFWP unpublished data) (Figure 3). Although the proportion of surveys in Cabinet Gorge Reservoir and Bull River are not exactly in-line with the most recent angler-use information, a deliberate effort was made to collect adequate baseline angler data on these two fisheries in concert with experimental Westslope Cutthroat Trout passage over Cabinet Gorge Dam (Bernall and Johnson 2016), to assess its potential influence on the recreational fishery. After the 3rd Saturday in May, when the Bull River opened to angling, Cabinet Gorge Reservoir and the Bull River were surveyed on the same day due to proximity and the collectively low number of access points between the two waters.

TABLE 1. The number of days creel survey interviews were conducted at specific predetermined sample areas stratified by waterbody, time of day and period. Cabinet Gorge Reservoir and the Bull River were sampled on the same day after May 15. From April 1 through May 15 only Cabinet Gorge Reservoir was surveyed because the Bull River was closed to fishing during that period.

Period	Noxon AM South	Noxon PM South	Noxon AM North	Noxon PM North	Cabinet Bull AM	Cabinet Bull PM	Period Total
April 1-May 15	11	13	3	6	3	4	40
May 16-June 30	13	15	5	3	7	9	52
July 1-Aug 15	14	14	7	5	6	7	53
Aug 16-Sept 30	17	19	5	4	9	6	60
Oct 1-Nov 30	18	19	6	7	8	10	68
Total	**73**	**80**	**26**	**25**	**33**	**36**	**273**

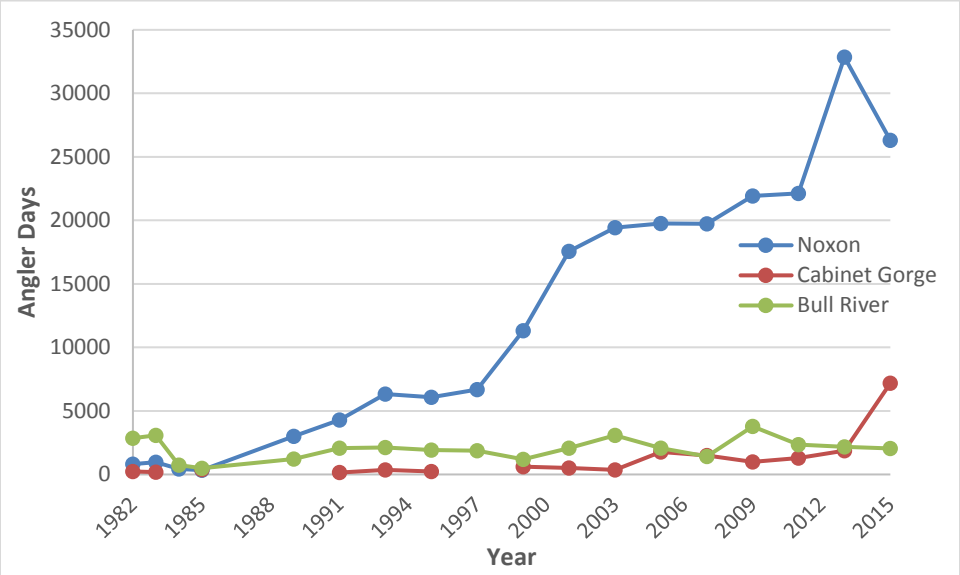

FIGURE 3. Estimates of fishing pressure (angler days) from 1982 to 2015 on Noxon Reservoir, Cabinet Gorge Reservoir and the Bull River from statewide mail-in surveys (MFWP data).

On Noxon Reservoir, 50% of surveys began on the east side of the reservoir and 50% on the west side of the reservoir. Similarly, 50% of surveys started on the Bull River and 50% on Cabinet Gorge Reservoir. Prior to the Bull River opening to fishing on May 16, surveys were only conducted on Cabinet Gorge Reservoir. To evenly sample mornings and evenings, 50% of surveys for a given month started approximately two hours after sunrise while the remaining 50% of surveys concluded approximately one-half hour after sunset. Efforts were made to sample weekdays and weekends/holidays proportional to their frequency on the calendar (Table 2). Proportionally more weekend and holidays were sampled on Cabinet Gorge Reservoir and Bull River to maximize the number of angler interviews, as these fisheries received substantially less pressure when compared to Noxon Reservoir (Table 2).

TABLE 2. The number of days creel survey interviews were conducted on weekdays versus weekends/holidays on Noxon Reservoir, Cabinet Gorge Reservoir and the Bull River. Cabinet Gorge Reservoir and the Bull River were sampled on the same day after May 15. From April 1-May 15 only Cabinet Gorge was surveyed because the Bull River was closed to fishing during that period.

	Noxon		**Cabinet-Bull River**	
Period	**Weekday**	**Weekend Holiday**	**Weekday**	**Weekend Holiday**
April 1-May 15	19	14	6	1
May 16-June 30	27	9	8	8
July 1-Aug 15	26	14	9	4
Aug 16-Sept 30	32	13	8	7
Oct 1-Nov 30	34	16	9	9
Total	**138**	**66**	**40**	**29**
Percent	68	32	58	42

Seventy-five percent of angler surveys at Noxon Reservoir were conducted at south shore access points and 25% at north shore access points. The justification for this effort was also based on professional judgment, specifically related to angler-use at access points. In general, south shore access points are easily accessible off Highway 200 which likely explains their disproportionately high use. South shore access points include Flat Iron, Finley Flat, Trout Creek, Trout Creek Bay, Marten Creek and South Shore (Figure 1). North shore access points include Thompson Falls State Park, Birdland Bay Bridge, Sqaylth-kwum Creek, county boat ramp, Vermilion Bay and North Shore (Figure 1). On days when angler interviews were conducted on Cabinet Gorge Reservoir, all known access locations were visited by clerks in a single day. These access sites include Bull River Bay, Big Eddy, Noxon and Heron boat access sites, south shore roadside pullouts near Noxon, north shore roadside pullouts, Pilgrim Creek and Elk Creek Bay (Figure 2). Bull River access sites include the Bull River Guard Station (only if mainstem was fished) and access points off Highway 56 at mile markers one, eight and 12 (Figure 2).

Aerial angler counts were conducted via fixed-wing aircraft and were stratified by six-week periods and time of day (AM/PM) (Table 3). These instantaneous angler counts were less structured and more opportunistic because they were dependent upon visibility and weather, along with local fire conditions and associated air traffic. All three waterbodies were easily counted over a one hour period. Angler count information collected during flights included the number of shore anglers, the number of boats fishing and the number of people actively fishing on each boat (pilots flew low enough to count those actively fishing on boats and from shore). We did not attempt to stratify by weekday versus weekend/holiday and a *post hoc* analysis of the flight data found no statistical differences in nearly all of the mean instantaneous anglers counts by period for both reservoirs (Appendix A, Tables A-1 and A-2). To compare angler counts on weekday versus weekend days, an f-test to compare the variance between the two means was

employed. If variance between the means was not significant (p-value > 0.05) a two-sample t-test was used, and if a significant difference (p-value < 0.05) between means was observed, a Welch two-sample t-test was used to account for unequal variance (Gotelli and Ellison 2004). Pairwise comparisons to assess differences in mean angler counts between six-week periods was evaluated using a one-way analysis of variance (ANOVA) with *post hoc* Tukey comparisons for significant ANOVA results (Appendix A, Tables A-3 to A-5) (Gotelli and Ellison 2004).

TABLE 3. Timing of angler counts conducted via fixed-wing aircraft on Noxon Reservoir, Cabinet Gorge Reservoir and the Bull River.

Period	**Time of Day**	**Weekday**	**Weekend**
April 1-May 15	AM	3	4
	PM	4	4
May 16-June 30	AM	2	5
	PM	3	4
July 1-Aug 15	AM	4	6
	PM	4	6
Aug 16-Sept 30	AM	3	6
	PM	2	6
Oct 1-Nov 30	AM	2	4
	PM	4	4
	Total	31	49
	Percent	39	61

Summary statistics

Harvest rates were calculated as the number of fish harvested divided by the total number of fish caught for a given species. Mean overall catch rate (similar to total ratio estimator, Malvuesto 1983) was used to estimate the total number of fish caught per angler group for a given species and time period because this estimate takes into account fish that were caught by anglers that were not targeting that species. Thus, mean overall catch rate gives a more realistic idea of total fish caught than mean targeted catch rate which only includes fish caught by anglers that were targeting that species. Mean overall catch rate for a species was calculated for each individual interview as the number of fish caught divided by the amount of time spent fishing. The average of these individual catch rates for a specific period was calculated for a given species and angler type (shore or boat angler).

Mean targeted catch rate (similar to means of ratio estimator, Malvuesto 1983) was used to estimate catch rates for fish caught by anglers that were actively targeting that species. Using information only for anglers that were targeting a certain species has been suggested to be the most appropriate measure of catch rate if the objectives of such analysis was to: 1) to measure fishing quality or success for a species; and 2) to obtain an index of stock abundance for

particular species (Malvuesto 1983). Daily targeted catch rates were calculated as the sum of all target species of fish caught on a specific day divided by the sum of the total effort. Daily targeted catch rate over a period was then averaged to provide mean targeted catch rate estimates for a specific species and angler type.

The difference between mean overall versus mean targeted catch rate on Noxon Reservoir across the eight month survey window was also evaluated. An f-test to compare the variance between the two means was employed. If variance between the means was not significant (p-value > 0.05) a two-sample t-test was used, and if a significant difference (p-value < 0.05) between means was observed, a Welch two-sample t-test was used to account for unequal variance (Gotelli and Ellison 2004).

Estimates of total fish caught per period are organized in this report by species and angler type. Factors that comprise this calculation include mean angler count from aerial surveys, mean daylight per period, the number of days in the period, and the mean overall catch rate. Confidence intervals were calculated for estimates of total catch using formulas developed for the propagation of error for products (K. Podruzny, MFWP, personal communication; Pezzullo 2013).

Estimates of total fish caught per period by angler type and species were calculated using the equation:

$$x = (a * c * e * f)$$

Standard error for estimates total fish caught per period by angler type and species were calculated using the equation:

$$SE\ x = (a * c * e * f) * \sqrt{\left(\frac{b}{a}\right)^2 + \left(\frac{d}{c}\right)^2 + \left(\frac{g}{f}\right)^2}$$

Where:

a = Mean angler count per period

b = Mean angler count per period standard error

c = Mean daylight length per period (hours)

d = Mean daylight length per period standard error

e = Days in a period

f = Mean CPUE per period (hours)

g = Mean CPUE per period standard error

x = Estimate of the number of a given fish species caught per period by angler type

SE x = Standard error for estimate of the number of a given fish species caught per period by angler type

To estimate total angling pressure per period by angler type, the following data were used: mean angler count from aerial surveys, mean daylight per period, the number of days in the period, and the mean trip length from completed trip interviews. Mean trip length was defined as the average amount of angling pressure from completed trips observed during a specific period. This was divided by period effort (mean angler count, mean daylight and days in the period) to estimate angler days per period (McFarland and Roche 1987). Confidence intervals for angling pressure were calculated using formulas developed for the propagation of error for products (K. Podruzny, MFWP, personal communication; Pezzullo 2013).

Estimates of angler days per period by angler type were calculated using the equation:

$$y = (a * c * e)/h$$

Standard error for estimates of angler days per period by angler type were calculated using the equation:

$$SE\ y = (j/h) * \sqrt{\left(\frac{k}{j}\right)^2 + \left(\frac{i}{h}\right)^2}$$

Where:

a = Mean angler count per period

b = Mean angler count per period standard error

c = Mean daylight length per period (hours)

d = Mean daylight length per period standard error

e = Days in a period

h = Mean trip length per period (hours)

i = Mean trip length per period standard error

j = Period effort (hours) $j = (a * c * e)$

k = Period effort standard error $k = (a * c) * \sqrt{\left(\frac{b}{a}\right)^2 + \left(\frac{d}{c}\right)^2}$

y = Estimate of angler days per period by angler type

SE y= Standard error for estimate of angler days per period by angler type

Results

Noxon Reservoir: angling effort and angler demographics

A total of 1,324 interviews were conducted on Noxon Reservoir representing lone anglers and angler parties (only one member of each angling party was interviewed). Interviews conducted at Finley Flat and Trout Creek access points, both located on the south shore of Noxon Reservoir, accounted for about 53% of interviews carried out during the creel survey (Table 4). Other top interview locations on Noxon Reservoir included North Shore, Marten Creek and Flat Iron. Together these five access sites, four of which are located on the reservoir's south shore, comprised nearly 86% of angler party interviews. About 85% of angling parties interviewed on Noxon Reservoir were Montana residents, 7% Idaho residents, 3% Washington residents and 5% were residents of other states, provinces or countries (Table 5). Of the Montana residents interviewed, approximately 47% were from Sanders County, 18% from Missoula County, 11% from Ravalli County and 7% from Lincoln County (Appendix B, Table B-1). In total, anglers from 20 different Montana counties were documented to have fished Noxon Reservoir from early spring through late fall of 2015 (Appendix B, Table B-1). It should be noted that while a total 1,324 interviews were documented, samples size varied for different summary statistics because in some instances creel clerks did not complete all of the required survey fields, making those interviews unusable for certain metrics (for example the total of 1,320 presented in Table 5).

TABLE 4. Number of angler party interviews by access location on Noxon Reservoir.

Noxon Reservoir		
Access Location	%	# of interviews
Finley Flat	27.0	357
Trout Creek	26.5	351
North Shore	11.6	153
Marten Creek	10.8	143
Flat Iron	9.9	131
South Shore	6.0	79
Vermilion Bay	3.7	49
Thompson Falls State Park	2.0	27
Trout Creek Bay	1.1	14
Birdland Bay Bridge	0.4	5
County Boat Ramp	0.4	5
Sqaylth-kwum Creek	0.2	3
Trout Creek roadside pullout	0.2	3
Thompson Falls Highway Bridge	0.2	3
Doty Bay	0.1	1
Total		**1,324**

TABLE 5. State of origin for angler parties interviewed at Noxon Reservoir (n=1320).

Angler Origin: Noxon Reservoir		
State	n	%
MT	1118	84.7
ID	97	7.3
WA	41	3.1
Other	64	4.9

Anglers fishing from boats represented 73% of interviews on Noxon Reservoir in 2015. The number of boat angler interviews obtained per period ranged from 101 interviews from October 1 through November 30 to 265 interviews from July 1 through August 15 (Table 6). The number of shore angler interviews obtained per period ranged from 36 from October 1 through November 30 to 104 from May 16 through June 30 (Table 6). Mean complete trip length for boat anglers ranged from 4.4 hours from October 1 through November 30 to 6.0 hours from July 1 through August 15 (Table 6). Mean complete trip length for shore anglers ranged from 2.0 hours from October 1 through November 30 to 3.0 hours from two different periods (May 16-June 30 and July 1- August 15) (Table 6). The 1,302 interviews outlined in Table 6, represent a total of 1945 boat anglers and 679 shore anglers. Forty-nine percent of interviews on Noxon Reservoir were from anglers that had completed their fishing trip.

TABLE 6. Summary statistics for angler party interviews conducted on Noxon Reservoir stratified by period and angler type including total number of interviews, total number of anglers, number of completed trips, mean trip length and 95% confidence intervals for mean trip length. This table does not take into account the additional 22 interviews that were not used due to missing or incomplete data.

Period	Angler Type	Total # of interviews	Total # of anglers	# of complete trips	Mean complete trip length (hrs)	Mean complete trip length 95% CI
April 1-May 15	Boat	134	277	83	5.2	0.5
	Shore	69	116	17	2.4	0.9
May 16- June 30	Boat	207	440	117	5.8	0.5
	Shore	104	236	13	3.0	1.8
July 1- August 15	Boat	265	595	160	6.0	0.5
	Shore	85	160	13	3.0	1.6
August 16- September 30	Boat	245	522	175	5.4	0.4
	Shore	56	109	5	2.3	1.0
October 1-November 30	Boat	101	111	45	4.4	0.6
	Shore	36	58	10	2.0	1.3
Total		1,302	2,624	638		

Angler count data from aerial surveys was considered a measure of instantaneous angling pressure and was used to estimate total pressure over the survey period as well as the total number of fish caught. Mean angler counts from aerial surveys ranged from 6.3 (± 5.0) boat anglers per flight between October 1 and November 30 to 40.3 (± 11.5) boat anglers from July 1 through August 15, with 14 to 20 flights being conducted per period (Table 7). The mean number of shore anglers ranged from 0.2 (± 0.4) per flight between October 1 and November 30 to 1.5 (± 0.8) anglers per flight from May 16 through June 30 (Table 7). The three six-week periods between May 16 and September 30 had the highest mean angler counts and the means between these periods were not significantly different from one another (Appendix A, Table A-3). No significant differences were found among means for shore angler counts for the five six-week periods from April 1 through November 30 (Appendix A, Table A-3).

TABLE 7. Mean angler count based on aerial surveys with 95% confidence intervals for Noxon Reservoir. The sample size (n) represents the number of flights per period. For the boat angler type, the mean represents the number of anglers counted on boats that were actively fishing.

		Noxon Reservoir		
Period	**Angler Type**	**Mean Angler Count**	**n**	**95% CI**
April 1-May 15	Boat	15.7	15	19.1
	Shore	1.0	15	0.7
May 16-June 30	Boat	31.1	14	10.0
	Shore	1.5	14	0.8
July 1-Aug 15	Boat	40.3	20	11.5
	Shore	1.4	20	0.6
Aug 16-Sept 30	Boat	33.4	17	12.1
	Shore	1.4	17	0.9
Oct 1-Nov 30	Boat	6.3	14	5.0
	Shore	0.2	14	0.4

Anglers interviewed for the creel survey were asked to indicate the species they were targeting on a trip and were able to target more than one species on a given trip. Of the 1,324 interviews obtained on Noxon Reservoir (Table 8), a total of 2,076 responses were collected for a mean of 1.6 species targeted per angling party. Northern Pike were the most sought after species in 2015, and were targeted by 25% of anglers (Table 8). Fishermen targeted Smallmouth Bass at a rate of about 19%, Largemouth Bass at around 10% and about 9% of those surveyed targeted both bass species on the same trip. Therefore, the bass group was targeted by 38% of the interviewed anglers. Yellow Perch were the third most popular species targeted by about 18% of anglers. Combined, Northern Pike, Yellow Perch and the two bass species represented nearly 82% of fish species sought after by anglers over the period of study. Other species of interest to anglers included Walleye (10%) and Pumpkinseed (5%). The remaining fish species such as trout, whitefish, native suckers and minnows were targeted infrequently and lumped into the "Other" category which comprised nearly 4% of those interviewed (Note: The "Other" category includes Pumpkinseed for catch and harvest metrics found in Results).

TABLE 8. Fish species (Spp.) targeted by anglers at Noxon Reservoir. Percentages are based on 1,324 angler party interviews where anglers were able to select one or more fish species they were targeting on a given trip (n=2,076).

Noxon Spp. Targeted	Percent
Northern Pike	25.0
Smallmouth Bass	19.1
Yellow Perch	18.4
Walleye	10.1
Largemouth Bass	10.1
Bass	9.2
Pumpkinseed	4.6
Other	3.5

The increased popularity of lower mainstem Clark Fork fisheries and the potential contribution to the local economy, presented the opportunity to collect basic demographic information from anglers such as the state of residency (and county for MT residents), duration of trip and their lodging accommodations (Table 9). In Table 9, angler demographic information was paired with species preferences (i.e., targeted species). Sanders County Montana residents comprised the highest proportion of anglers targeting Walleye and Yellow Perch, at about 42% and 43% respectively. Largemouth Bass and Northern Pike were the species least targeted by Sanders County residents at about 29% each. Largemouth Bass were the species targeted at the highest rate by out-of-state fishermen at 22%. Walleye anglers comprised the highest percentage of fisherman that made day trips to the reservoir, at around 52%. Twenty percent of those targeting Largemouth Bass stayed in local hotels, the highest rate for those seeking area lodging. About 50% of Northern Pike fishermen camped (including RV), or stayed at friends or relatives' homes, the highest rate for that category.

TABLE 9. Summary of demographic information for angler parties targeting popular gamefish species on Noxon Reservoir. Percentages are based on the sample size for a given category and divided by the total number interviews targeting a specific species. The bass category represents the sum interviews where groups or individuals were targeting Largemouth Bass, Smallmouth Bass or both species.

		Residency			Accommodations			
Species*	**Interviews Targeting Species (total)**	**Sanders County**	**From MT**	**Out of State**	**Home (i.e., day trip)**	**Motel-Rental**	**Own Property in Area**	**Camping, RV, Relatives Friend's House**
NP (%)		28.5	82.3	17.7	35.1	10.2	3.9	50.1
n	519	148	427	92	182	53	20	260
SMB (%)		34.9	84.2	15.8	43.3	13.0	3.6	38.9
n	393	137	331	62	170	51	14	153
LMB (%)		28.6	78.2	21.8	39.8	20.4	2.9	36.4
n	206	59	161	45	82	42	6	75
Bass (%)		38.7	85.4	14.6	44.8	11.5	3.4	39.3
n	652	252	557	95	292	75	22	256
WE (%)		42.2	86.7	13.3	51.7	15.7	1.9	39.8
n	211	89	183	28	109	14	4	84
YP (%)		42.7	87.4	12.6	46.4	5.6	3.3	43.6
n	429	183	375	54	199	24	14	187

* Species abbreviations used throughout follow MFWP nomenclature and are as follows; NP: Northern Pike, SMB: Smallmouth Bass, LMB: Largemouth Bass, WE: Walleye, and YP: Yellow Perch.

Estimates of angling pressure were calculated by period for both shore and boat anglers (Table 10). These estimates suggested that most boat angling pressure occurred from July 1 through August 15 and the most shore angling pressure occurred from August 16 through September 30, although shore pressure was very similar from May 15 through September 30. The lowest period for both shore and boat anglers was from October 1 through November 30.

TABLE 10. Estimates of angling pressure for shore and boat anglers on Noxon Reservoir based on mean angler counts from aerials surveys, mean daylight per period, the number of days per period and mean angler trip length per period for completed trips.

Period	Angler Type	# Angler days	95% CI (+/-)
Apr 1-May 15	Boat	1912.5	1240.7
Apr 1-May 15	Shore	264.6	214.7
May 16- June 30	Boat	3919.3	1300.5
May 16- June 30	Shore	359.4	281.9
July 1- Aug 15	Boat	4718.7	1396.8
July 1- Aug 15	Shore	325.4	222.8
Aug 16- Sept 30	Boat	3724.4	1380.9
Aug 16- Sept 30	Shore	362.0	281.9
Oct 1-Nov 30	Boat	880.8	703.2
Oct 1-Nov30	Shore	62.1	136.4
		16,529.2	**7,159.8**

Noxon Reservoir: harvest and catch

Creel interviews on Noxon Reservoir documented nearly 11,500 fish of at least 15 different species caught by anglers from April through November of 2015 (Figure 4) (Appendix B, Table B-2). Survey participants caught approximately 5,100 Yellow Perch, 2,900 Smallmouth Bass, 1,200 Pumpkinseed, 1,000 Largemouth Bass, 800 Northern Pike and 140 Walleye (Table 11). Overall harvest rates for popular gamefish varied quite dramatically from about 4% of Largemouth Bass harvested to 84% of Walleye (Table 11). The Walleye harvest rate was over two times that of Northern Pike (36%) and seven times higher than Smallmouth Bass (12%).

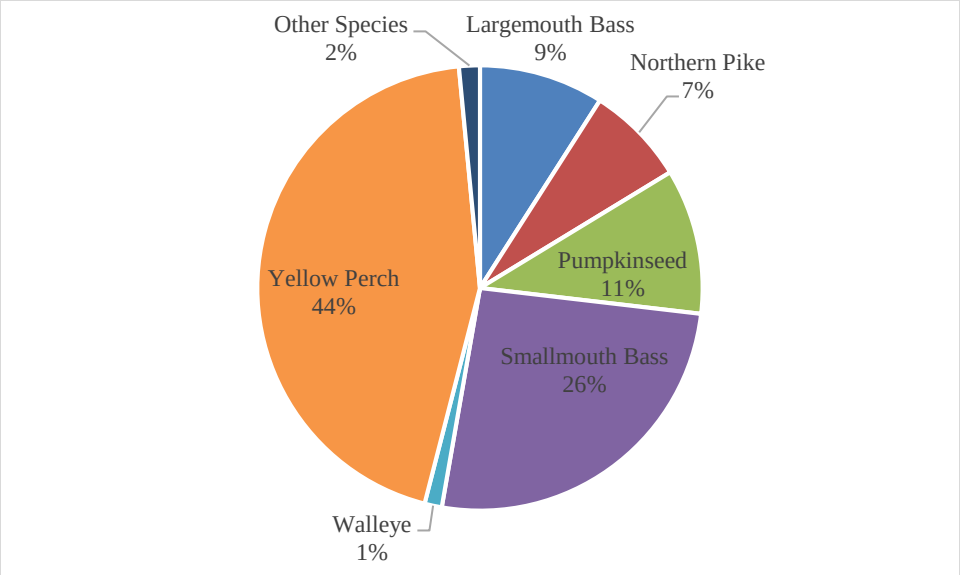

FIGURE 4. Percentage of total catch by interviewed anglers for commonly caught fish species on Noxon Reservoir, April through November 2015. The "Other Species" category includes various species of trout, whitefish, suckers, minnows and bullheads.

Length frequency histograms for popular gamefish harvested can be found in Appendix B, Figures B-1 through B-5. Mean harvest length for the most popular sportfish were as follows; Northern Pike: 620.5 mm (± 12.8), Smallmouth Bass: 295.6 mm (± 6.9), Largemouth Bass: 332.3 mm (± 23.6), Walleye: 433.9 mm (± 12.6), Yellow Perch: 213.6 mm (± 1.4) (Table 12).

TABLE 11. Catch summary statistics from interviewed anglers for commonly targeted gamefish species on Noxon Reservoir including the number harvested, released, total caught and overall harvest rate (%).

Noxon Reservoir, April-November 2015				
Species	Harvested	Released	Total Caught	Overall Harvest Rate (%)
Walleye	121	23	144	84.0
Northern Pike	298	534	832	35.8
Yellow Perch	1700	3408	5108	33.3
Smallmouth Bass	355	2619	2974	11.9
Pumpkinseed	118	1094	1212	9.7
Largemouth Bass	37	1003	1040	3.6

TABLE 12. Mean length (mm), sample size (n) and 95 % confidence intervals for popular gamefish species harvested on Noxon Reservoir and measured by creel clerks.

	Noxon Reservoir		
Species	Mean Length (mm)	n	95% CI (mm)
Northern Pike	620.5	297	12.8
Smallmouth Bass	295.6	346	6.9
Largemouth Bass	332.3	37	23.6
Walleye	433.9	121	12.6
Yellow Perch	213.6	1700	1.4

Targeted catch rates, targeted harvest rates, and associated summary statistics were organized by period, species and angler type and can be found in Appendix B, Table B-3. The range of mean catch rates and proportion of fish harvested for boat anglers can be found in Figures 5 and 6. The following ranges of catch and harvest rates presented are for *boat anglers*, shore angler data can be found in Appendix B. Northern Pike mean targeted catch rate ranged from 0.08 fish/hr (± 0.06) from April 1 through May 15 to 0.21 fish/hr (± 0.08) from July 1 through August 15. The mean proportion of Northern Pike harvested ranged from 0.25 fish/hr (± 0.12) from July 1 through August 15 to 0.44 fish/hr (± 0.17) from May 16 through June 30. Smallmouth Bass mean targeted catch rate ranged from 0.31 fish/hour (± 0.24) from April 1 through May 15 to 0.76 fish/hr (± 0.30) from August 16 through September 30. The mean proportion of Smallmouth Bass harvested ranged from 0.01 (± 0.02) from May 16 through June 30 to 0.22 (± 0.11) from August 16 through September 30. Largemouth Bass mean targeted catch rate ranged from 0.25 fish/hr (± 0.10) from July 1 through August 15 to 0.76 fish/hr (± 0.44) from October 1 through November 30. The mean proportion of Largemouth Bass harvested ranged from no fish being harvested from April 1 through May15 to 0.17 (± 0.23) from October 1 through November 30. Walleye mean targeted catch rate ranged from 0.01 fish/hr (± 0.02) from October 1 through November 30 to 0.15 fish/hr (± 0.12) from July 1 through August 15. The mean proportion of Walleye harvested ranged from 0.72 (± 0.22) from July 1 through August 15 to all fish harvested in both the August 16 to September 30 and the October 1 to November 30 periods. Yellow Perch mean targeted catch rate ranged from 0.74 fish/hr (± 0.37) from May 16 through June 30 to 2.15 fish/hr (± 1.16) from August 16 through September 30. The mean proportion of Yellow Perch harvested ranged from 0.13 (± 0.13) between May 16 through June 30 to 0.68 (± 0.19) from April 1 through May 15. Mean targeted catch rate for "Other" species category which includes Pumpkinseed, whitefish, trout, sucker and minnow species ranged from 0.20 fish/hr (± 0.08) from July 1through August 15 to 1.39 fish/hr (± 1.59) from May 16 through June 30. The proportion of "Other" species harvested ranged no fish harvested in the April 1 to May 15 and October 1 to November 30 periods to 0.17 (± 0.33) from May 16 through June 30.

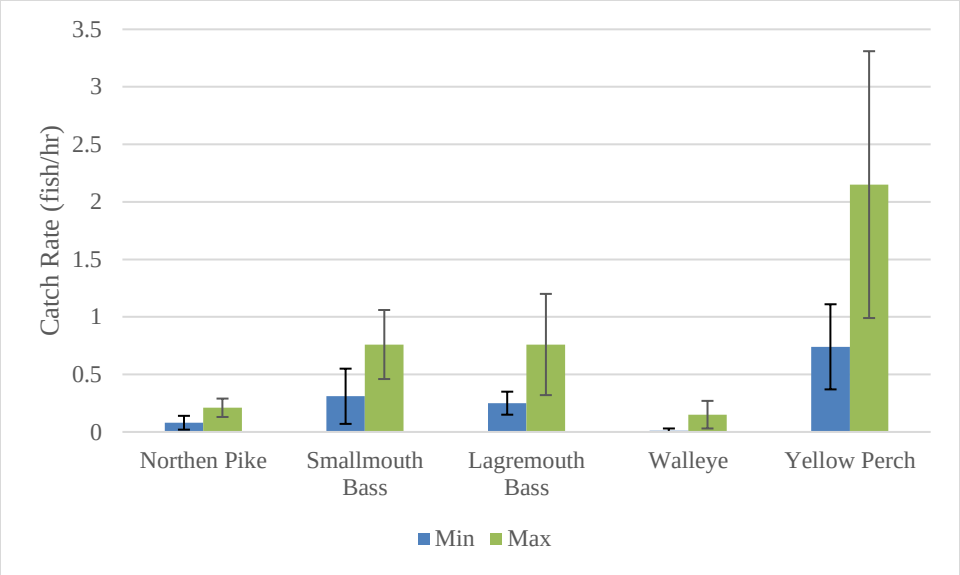

FIGURE 5. Minimum (Min) and maximum (Max) period mean targeted catch rates with 95% confidence intervals for boat anglers fishing for popular gamefish species on Noxon Reservoir in 2015.

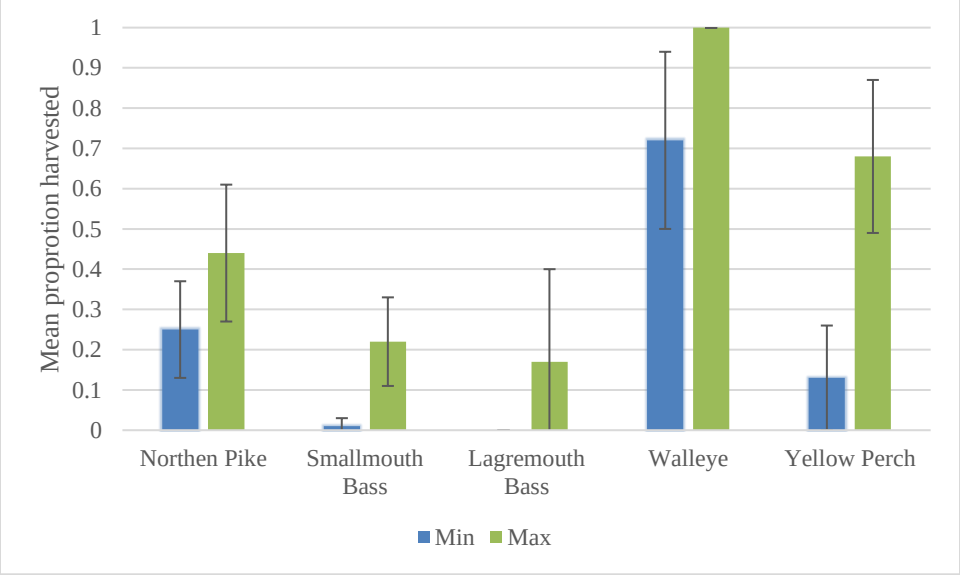

FIGURE 6. Minimum (Min) and maximum (Max) period mean proportion of fish harvested with 95% confidence intervals for boat anglers fishing for popular gamefish species on Noxon Reservoir in 2015.

Based on data from this eight month survey, nearly 277,000 (range 122,000-431,000) fish were estimated to have been caught by anglers on Noxon Reservoir in 2015 (Appendix B, Table B-4). It is estimated that anglers caught about 115,000 Yellow Perch, 58,000 Smallmouth Bass, 47,000 "Other" species, 32,000 Largemouth Bass, 17,000 Northern Pike and 7000 Walleye (Appendix B, Table B-4).

To determine whether mean targeted catch rate differed from mean overall catch rate across the extent of the creel survey, a two-sample t-test was employed (Table 13). These alternative catch rates were calculated in the same way as described in the Methods; however, Table 13 represents data from the entire length of the survey and is not broken up by period. No significant differences were observed for mean overall versus mean targeted catch rate in all species caught by boat anglers. The only significant difference in catch rate was observed for shore anglers that caught Largemouth Bass, where the mean targeted catch rate was significantly higher than mean overall catch rate.

TABLE 13. Comparison mean overall catch rate versus mean targeted catch rate using a two-sample t-test for Noxon Reservoir.

Noxon Reservoir						
Species	**Angler Type**	**Overall catch rate**	**Targeted catch rate**	**df**	**T-stat**	**P-value**
Northern Pike	Boat	0.20	0.17	238.03	-1.30	0.19
Northern Pike	Shore	0.16	0.10	142.71	-0.88	0.38
Smallmouth Bass	Boat	0.68	0.61	244.72	-0.92	0.36
Smallmouth Bass	Shore	0.82	0.89	124.55	0.15	0.88
Largemouth Bass	Boat	0.40	0.47	333.00	0.85	0.40
Largemouth Bass	Shore	0.39	0.95	29.54	2.28	**0.03**
Walleye	Boat	0.08	0.09	243.00	0.24	0.81
Walleye	Shore	0.02	0.02	36.00	0.16	0.87
Yellow Perch	Boat	1.42	1.39	233.37	-0.11	0.91
Yellow Perch	Shore	1.36	2.14	86.38	1.38	0.17
Other	Boat	0.52	0.47	200.00	-0.40	0.69
Other	Shore	1.43	1.55	138.00	0.28	0.78

Cabinet Gorge Reservoir: angling effort and angler demographics

A total of 228 interviews were conducted on Cabinet Gorge Reservoir. Interviews conducted at Bull River Bay and Big Eddy access points, accounted for nearly 64% of interviews carried out during the creel survey (Table 14). Other top interview locations on Cabinet Gorge Reservoir included south shore roadside pullouts and the Noxon boat ramp. Together these four access sites, comprised almost 83% of angler party interviews. About 68% of angling parties interviewed on Cabinet Gorge Reservoir were Montana residents, 22% Idaho residents, 5% Washington residents and 5% were residents of other states, provinces or countries (Table 15). Of the Montana residents interviewed, approximately 54% were from Sanders County, 20% from Lincoln County, 10% from Missoula County and 6% from Flathead County (Appendix C, Table C-1). In total, anglers from 14 different Montana counties were documented to have fished Cabinet Gorge from early spring through late fall of 2016 (Appendix C, Table C-1).

TABLE 14. Number of angler party interviews by access location on Cabinet Gorge Reservoir.

Cabinet Gorge Reservoir		
Access Location	%	# of interviews
Bull River Bay	47.1	107
Big Eddy	16.7	38
South shore roadside pullouts	10.1	23
Noxon Boat Ramp	8.8	20
Heron Boat Ramp	5.7	13
North shore roadside pullouts	5.7	13
Pilgrim Creek	4.0	9
Elk Creek Bay	1.8	4
		227

TABLE 15. State of origin for angler parties interviewed at Cabinet Gorge Reservoir (n=226).

Angler Origin: Cabinet Gorge Reservoir		
State	n	%
MT	153	67.7
ID	49	21.7
WA	12	5.3
Other	12	5.3

Anglers fishing from boats represented 57% of interviews on Cabinet Gorge Reservoir. The number of boat angler interviews obtained per period ranged from 9 interviews from April 1 through May 15 to 36 interviews from May 16 through June 30 (Table 16). The number of shore angler interviews obtained per period ranged from 9 from October 1 through November 30 to 40 from May 16 through June 30 (Table 16). Mean complete trip length for boat anglers ranged from 4.6 hours from October 1 through November 30 to 7.4 hours from April 1 through May 15 (Table 16). Mean complete trip length for shore anglers ranged from 0.8 hours from October 1 through November 30 to 5.5 hours from July 1 through August 15 (Table 16). The 220 interviews outlined in Table 16, represent a total of 262 boat anglers and 175 shore anglers. Forty-four percent of interviews on Cabinet Gorge Reservoir were from anglers that had completed their fishing trip.

TABLE 16. Summary statistics for angler party interviews conducted on Cabinet Gorge Reservoir stratified by period and angler type including total number of interviews, total number of anglers, number of completed trips, mean trip length and 95% confidence intervals for mean trip length. This table does not take into account the additional 8 interviews that were not used do to missing or incomplete data.

Period	Angler Type	Total # of interviews	Total # of anglers	# of complete trips	Mean complete trip length (hrs)	Mean complete trip length 95% CI
April 1-May 15	Boat	9	20	6	7.4	1.4
	Shore	17	26	1	2.1	-
May 16- June 30	Boat	36	78	22	4.9	1.0
	Shore	40	88	6	2.1	1.0
July 1- August 15	Boat	34	67	21	5.5	1.2
	Shore	16	30	2	5.5	0.3
August 16- September 30	Boat	30	67	17	5.4	1.2
	Shore	12	19	2	2.0	2.1
October 1-November 30	Boat	17	30	15	4.6	1.3
	Shore	9	12	5	0.8	0.2
Total		220	437	97		

Angler count data from aerial surveys was considered a measure of instantaneous angling pressure and was used to estimate total pressure over the survey period. Mean anglers count from aerial surveys ranged from 1.4 (± 1.1) boat anglers per flight between October 1 and November 30 to 6.3 (± 1.7) boat anglers from July 1 through August 15, with 14 to 20 flights conducted per period (Table 17). The mean number of shore anglers ranged from no shore anglers counted from August 16 through September 30 and October 1 through November 30 to 0.3 (± 0.4, 0.6) shore anglers per flight from April 1 through May 15 and May 16 through June 30 (Table 17). Clerks did interview shore fishermen during the two periods where no shore anglers were counted; therefore, 0.1 anglers per period was used to calculate estimates for fish caught and angling pressure to account for a minimal level of shore angling pressure during these time periods. The three six-week periods from May 16 through September 30 had the highest mean angler counts and the means between these periods were not significantly different from one another (Appendix A, Table A-4). No significant difference was found among means for shore angler counts for the five six-week periods from April 1 through November 30 (Appendix A, Table A-4).

TABLE 17. Mean angler count based on aerial surveys with 95% confidence intervals for Cabinet Gorge Reservoir. The sample size (n) represents the number of flights per period. For the boat angler type, the mean represents the number of anglers counted on boats that were actively fishing.

		Cabinet Gorge Reservoir		
Period	**Angler Type**	**Mean Angler Count**	**n**	**95 % CI**
April 1-May 15	Boat	2.2	15	1.2
	Shore	0.3	15	0.4
May 16-June 30	Boat	3.8	14	1.6
	Shore	0.3	14	0.6
July 1-Aug 15	Boat	6.3	20	1.7
	Shore	0.1	20	0.1
Aug 16-Sept 30	Boat	4.2	17	1.4
	Shore	0.0	17	0.0
Oct 1-Nov 30	Boat	1.4	14	1.1
	Shore	0.0	14	0.0

Of the 228 interviews obtained on Cabinet Gorge Reservoir, a total of 336 responses were collected for a mean of 1.5 species targeted per angling party (Table 18). Northern Pike were the most sought after species in 2015, and were targeted by 41% of anglers (Table 18). Anglers targeted Smallmouth Bass at a rate of about 20%, Largemouth Bass at around 3% and about 7% of those surveyed targeted both bass species on the same trip. The bass group in total represented 30% of species targeted by anglers. Yellow Perch were the third most popular species targeted by about 14% of anglers. Northern Pike, Yellow Perch and the two bass species represented nearly 84% of fish species sought after by anglers during the period of study. Other species of interest to anglers included Walleye (10%) and Trout species (4%). The remaining fish species such as whitefish, native suckers and minnows were targeted infrequently and lumped into the "Other" category which comprised nearly 2% of those interviewed (Note: The "Other" category includes Pumpkinseed for catch and harvest metrics found in Results).

TABLE 18. Fish species (Spp.) targeted by anglers at Cabinet Gorge Reservoir. Percentages are based on 228 angler party interviews where anglers were able to select one or more fish species they were targeting on a given trip (n=336).

Cabinet Gorge Spp. Targeted	%
Northern Pike	40.5
Smallmouth Bass	19.9
Yellow Perch	13.7
Walleye	10.1
Bass	7.4
Trout spp.	4.2
Largemouth Bass	2.7
Other	1.5

Angler demographic-species preference information was also collected at Cabinet Gorge Reservoir (Table 19). Sanders County Montana residents comprised the highest proportion of anglers targeting Walleye and Yellow Perch, at 37% each. Smallmouth Bass were the species least targeted by Sanders County residents at about 34%. Northern Pike were targeted by around 34% of out-of-state fishermen, the highest rate observed in this survey. Northern Pike anglers had the highest percentage of fisherman that made day trips to the reservoir, at around 65%. Around 6% percent of those targeting Bass species stayed in local hotels, the highest rate for those seeking area lodging. About 50% of Yellow Perch fishermen camped (including RV), or stayed at friends or relatives' homes, the highest rate for that category.

TABLE 19. Summary of demographic information for angler parties targeting popular gamefish species on Cabinet Gorge Reservoir. Percentages are based on the sample size for a given category and divided by the total number of interviews targeting a specific species. The Bass category represents the sum interviews where groups or individuals were targeting Largemouth Bass, Smallmouth Bass or both species.

		Residency			Accommodations			
Species	**Interviews Targeting Species (total)**	**Sanders County (%)**	**From Montana**	**Out of State**	**Home (i.e., day trip)**	**Motel-Rental**	**Own Property in Area**	**Camping, RV, Relatives Friend's House**
NP (%)		35.8	66.4	33.6	65.0	3.6	1.5	29.2
n	137	49	91	46	89	5	2	40
SMB (%)		33.8	70.6	29.4	55.9	4.4	4.4	35.3
n	68	23	48	20	38	3	3	24
Bass (%)		35.1	72.3	27.7	56.4	6.4	4.3	31.9
n	94	33	68	26	53	6	4	30
WE (%)		37.0	77.8	22.2	55.6	-	-	44.4
n	27	10	21	6	15	0	0	12
YP (%)		37.0	71.7	28.3	47.8	-	2.2	50.0
n	46	17	33	13	22	0	1	23

Estimates of angling pressure were calculated by period for both shore and boat anglers on Cabinet Gorge Reservoir (Table 20). Estimates suggest that most boat angling pressure occurred from July 1 through August 15 and that most shore angling pressure occurred from April 1 through May 15. The lowest period for boat anglers was from April 1 through May 15 although the period from October 1 through November 30 was similarly low. Two periods had low estimates of shore angling pressure, July 1 through August 15 and August 16 through September 30. Each estimate has large confidence interval, most are not statistically different from one another and should be taken with caution.

TABLE 20. Estimates of angling pressure for shore and boat anglers on Cabinet Gorge Reservoir based on mean angler counts from aerial surveys, mean daylight per period, and mean angler trip length per period.

Period	Angler Type	# Angler days	95% CI (+/-)
Apr 1-May 15	Boat	187.6	110.4
Apr 1-May 15	Shore	101.6	125.9
May 16- June 30	Boat	556.1	254.3
May 16- June 30	Shore	98.4	198.8
July 1- Aug 15	Boat	799.6	282.0
July 1- Aug 15	Shore	12.6	17.0
Aug 16- Sept 30	Boat	471.8	184.4
Aug 16- Sept 30	Shore	29.8	51.2
Oct 1-Nov 30	Boat	179.7	149.5
Oct 1-Nov30	Shore	75.9	103.5
		2,513.2	**1,477.0**

Cabinet Gorge Reservoir: harvest and catch

Creel interviews on Cabinet Gorge Reservoir documented over 900 fish of at least 12 different species caught by anglers from April through November of 2015 (Figure 7) (Appendix C, Table C-2). Survey participants caught approximately 330 Yellow Perch, 320 Smallmouth Bass, 190 Northern Pike, 35 Walleye and 20 Largemouth Bass (Table 21). Overall harvest rates for popular gamefish varied quite dramatically from about 6% of Largemouth Bass harvested to 86% of Walleye (Table 21). The Walleye harvest rate was over two times that of Northern Pike (41%) and over 10 times higher than Smallmouth Bass (8%). Length frequency histograms for popular gamefish harvested can be found in Appendix C, Figures C-1 through C-4. Mean harvest length for the most popular sportfish are as follows: Northern Pike 645.9 mm (± 29.2), Smallmouth Bass 336.3 mm (± 26.4), Walleye 442.8 mm (± 32.1), and Yellow Perch 212.1 mm (± 8.3) (Table 22).

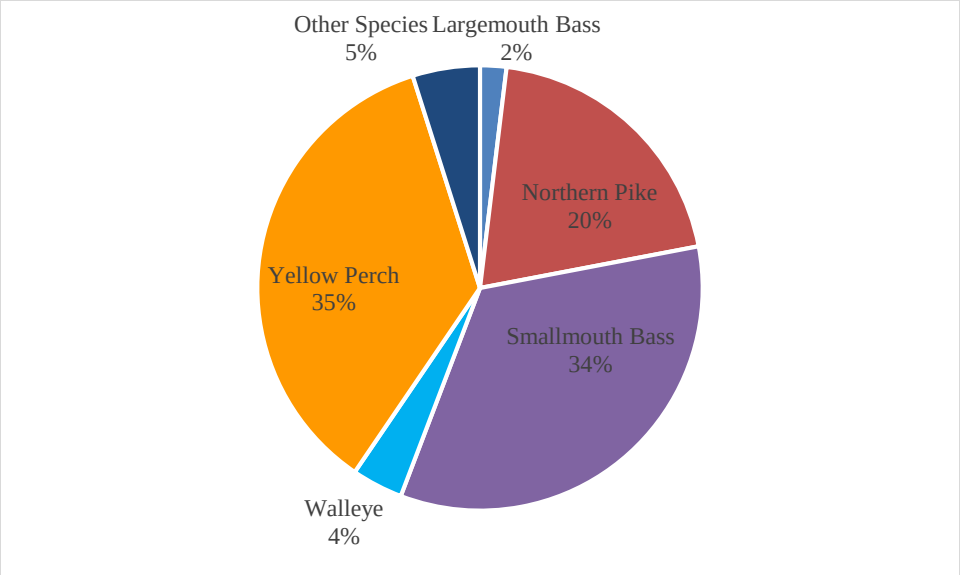

FIGURE 7. Percentage of total catch by interviewed anglers for commonly caught fish species on Cabinet Gorge Reservoir, April through November 2015. The "Other Species" category includes various species of trout, whitefish, suckers and Northern Pikeminnow.

TABLE 21. Catch summary statistics from interviewed anglers for commonly targeted gamefish species on Cabinet Gorge Reservoir including the number harvested, released, total caught and harvest rate (%).

Cabinet Gorge Reservoir, April-November 2015				
Species	# Harvested	# Released	Total Caught	Harvest Rate (%)
Walleye	30	5	35	85.7
Northern Pike	78	111	189	41.3
Yellow Perch	61	274	335	18.2
Smallmouth Bass	26	292	318	8.2
Largemouth Bass	1	17	18	5.6

TABLE 22. Mean length (mm), sample size (n) and 95% confidence intervals for popular gamefish species harvested on Cabinet Gorge Reservoir and measured by creel clerks.

	Cabinet Gorge Reservoir		
Species	Mean Length (mm)	n	95 % CI (mm)
Northern Pike	645.9	77	29.2
Smallmouth Bass	336.3	25	26.4
Largemouth Bass	-	-	-
Walleye	442.8	30	32.1
Yellow Perch	212.1	63	8.3

Targeted catch rates, targeted harvest rates along with associated summary statistics are organized by period, species and angler type in Appendix C, Table C-3. The range of mean catch rates and proportion of fish harvested for boat anglers can be found in Figures 8 and 9. The following ranges of catch and harvest rates presented are for *boat anglers*, shore angler data can be found in Appendix C. Northern Pike mean targeted catch rate ranged from 0.09 fish/hr (± 0.06) from October 1 through November 30 to 0.33 fish/hr (± 0.47) from April 1 through May 15. The mean proportion of Northern Pike harvested ranged from 0.41 (± 0.80) from April 1 through May 15 to 0.59 (± 0.27) from May 16 through June 30. Smallmouth Bass mean targeted catch rate ranged from 0.21 fish/hr (± 0.11) from October 1 through November 30 to 0.51 fish/hr (± 0.32) from July 1through August 15. The mean proportion of Smallmouth Bass harvested ranged from no fish harvested from April 1 through May 15 as well as from May 16 through June 30 to 0.35 (± 0.40) from August 16 through September 30. Largemouth Bass mean targeted catch rate ranged from 0.05 fish/hr (± 0.00) from August 16 through September 30 to 0.42 fish/hr (± 0.70) from October 1 through November 30. No anglers targeted Largemouth Bass from April 1 through May 15 and from July 1 through August 15. No Largemouth Bass were recorded to be harvested during the entire survey period. Walleye targeted mean catch rate ranged from 0.00 fish/hr from April 1 through May 15 to 0.39 fish/hr (± 0.77) from May 16 through June 30. The mean proportion of Walleye harvested ranged from no fish harvested from April 1 through May 15 and October 1 through November 30 to all fish harvested from May 16 through June 30. Yellow Perch mean targeted catch rate ranged from no fish caught from April 1 through May 15 to 1.80 fish/hr (± 2.37) from July 1 through August 15. The mean proportion of Yellow Perch harvested ranged from no fish harvested from April 1 through May 15 and October 1 through November 30 to 0.34 (± 0.64) from August 16 through September 30. Estimates of total number of fish caught were not produced for Cabinet Gorge Reservoir due to the small sample size and the lack of information collected for many of the period/ angler type/ species categories. Similarly, a comparison of mean targeted versus overall catch rates were not produced due to the low number of interviews obtained on Cabinet Gorge Reservoir.

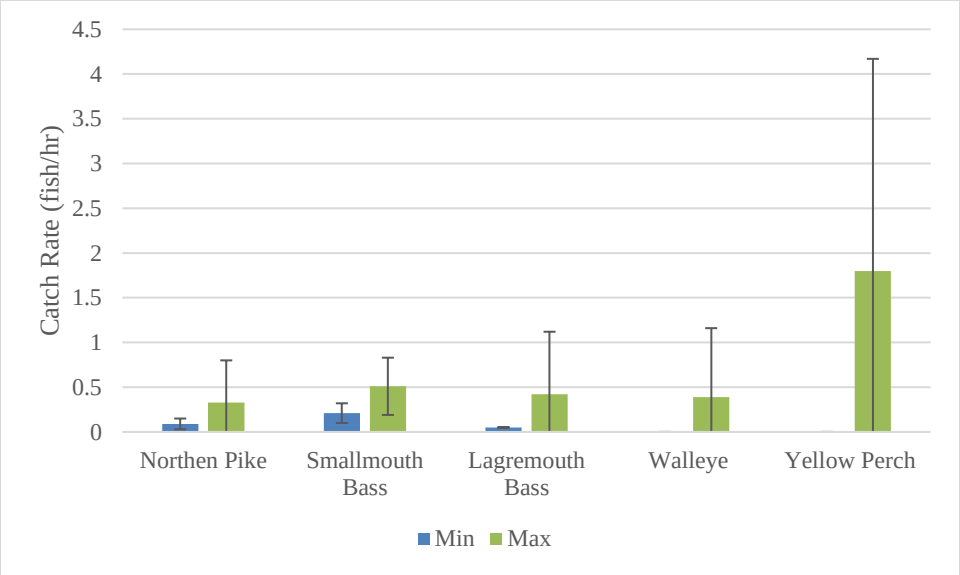

FIGURE 8. Minimum (Min) and maximum (Max) period mean targeted catch rates with 95% confidence intervals for boat anglers fishing popular gamefish species on Cabinet Gorge Reservoir in 2015.

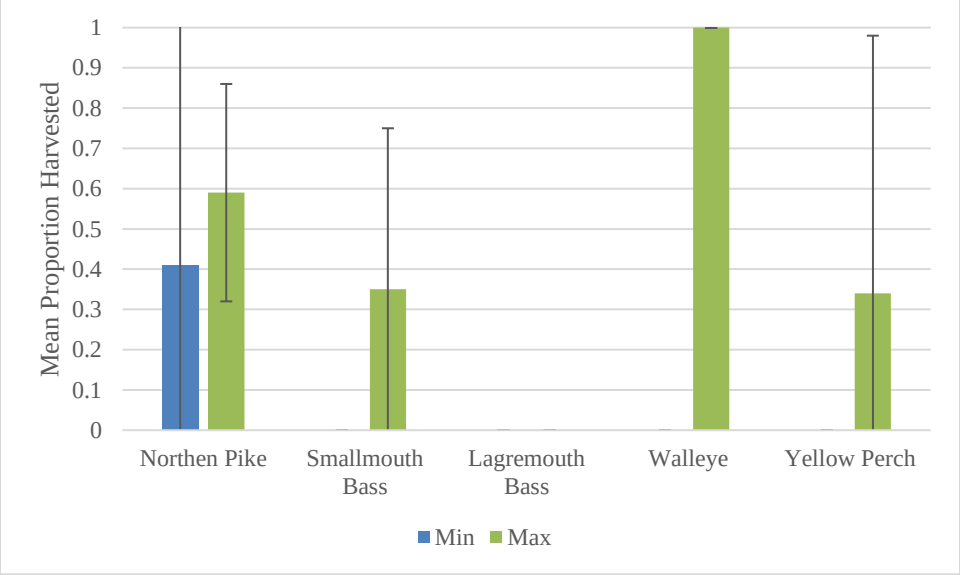

FIGURE 9. Minimum (Min) and maximum (Max) period mean proportion of fish harvested with 95% confidence intervals for boat anglers fishing for popular gamefish species on Cabinet Gorge Reservoir in 2015.

Bull River

A total of 25 angler interviews were obtained on the Bull River from May 16 through November 30 and included nine complete and 16 incomplete interviews (Table 23). Seventeen of the parties interviewed were shore anglers and eight were boat anglers, representing a total of 43 anglers (Table 23). Twenty-three fish were caught for a trout species catch rate of 0.64 (± 0.36)

fish/hr (Table 24). Species captured by anglers included Westslope Cutthroat Trout (n=18), Brown Trout (n=3) and Bull Trout (n=2) (Table 24). In general, boat and shore angler counts were low (Table 25), and the Bull River was not flown from mid-August to mid-September due to multiple wildfires in the drainage. No significant difference in mean instantaneous angler counts were observed for boat or shore fishermen across each of the four six-week periods from May 16 through November 30 (Appendix A, Table A-5).

TABLE 23. Summary information for angler party interviews on the Bull River.

Bull River	
Summary Information	**n**
Interviews	25
Complete interviews	9
Incomplete interviews	16
Boat interview parties	8
Shore interview parties	17
Total of anglers	43
Fish Caught	23
Fish Harvested	0
Trout spp. catch rate (fish/hr)	0.64
Trout spp. catch rate 95% CI	0.46

TABLE 24. Summary information for the Bull River including angler party target species, number of fish caught and overall catch rate.

	Bull River		
Species	**# Targeted**	**# Caught**	**Overall catch rate (fish/hr)**
Brown Trout	9	3	0.44
Trout	8	-	-
Westslope Cutthroat Trout	6	18	0.31
Rainbow Trout	2		-
Bull Trout	-	2	0.63

Table 25. Mean angler count for the Bull River based on aerial surveys with 95% confidence intervals. The sample size (n) represents the number of flights per period. For the boat angler type, the mean represents the number of anglers counted on boats that were actively fishing. Note, estimates for the August 16 through September 30 period were estimated minimums due to an active wildfire that restricted angler and surveyor access.

Period	Angler Type	Mean Angler Count	n	95 % CI
May 16-June 30	Boat	1.0	12	0.7
	Shore	0.5	12	0.7
July 1-Aug 15	Boat	1.0	20	1.0
	Shore	0.5	20	0.4
Aug 16-Sept 30	Boat	0.0	7	-
	Shore	0.0	7	-
Oct 1-Nov 30	Boat	0.2	14	0.3
	Shore	0.1	14	0.1

Discussion

Noxon Reservoir has seen a 25 to 30-fold increase in angling pressure since the early 1980s due to the establishment of a diverse sportfishery. During the creel survey period from April 1 through November 30, 2015; the Noxon Reservoir angling pressure estimate calculated from data collected from this survey estimated 33% fewer angler days compared to the estimate calculated from MFWP's angler pressure data from random mail-in angler surveys over the same time period (16,529 vs. 24,775 angler days). A possible bias associated with using roving creel survey data to calculate pressure is that pressure may be under estimated by missing anglers that took short fishing trips; those that come and go undetected. The resulting error is compounded because the absence of those short trips from calculations leads to a longer average completed trip length which drives down the estimate (D. Skaar, MFWP, personal communication). The Cabinet Gorge pressure estimate calculated for this survey was 63% less when compared to the estimate produced from the mail-in survey over the same timeframe (2,513 vs. 6,848 angler days). It is likely that the relatively low sample size of angler interviews obtained on Cabinet Gorge Reservoir exacerbated the bias associated with the roving creel survey methodology. Overall, estimates of angling pressure have remained low at Cabinet Gorge Reservoir when compared to Noxon Reservoir; 3.6 times lower over the eight month survey period in 2015 based on MFWP mail-in surveys and 6.5 times lower based on estimates from this report.

Estimates of angling pressure over the creel period were also independently calculated using a creel census program developed by MFWP in the 1980s (McFarland and Roche 1987) and compared to the estimates produced in this document. Differences in estimates of total angling

pressure between the method used for this creel survey and the method used in the MFWP creel census program were small, less than 500 angler days for Noxon Reservoir and less than 400 angler days for Cabinet Gorge Reservoir. This suggests that the estimates produced for this report are acceptably consistent, however caution should be taken given the possible bias associated with roving creel surveys and the large confidence intervals that surround these estimates.

In the past, the MFWP mail-in surveys described the lower Clark Fork River from the confluence of the Flathead River to the Idaho border as Clark Fork River Section 1. This section also encompasses three mainstem impoundments, so in the past it is likely that some anglers stated they were fishing the Clark Fork River when they were actually fishing one of the reservoirs, possibly in a section that had riverine characteristics. This past overlap likely led to overestimates of fishing pressure on Clark Fork River Section 1, and probably underestimated pressure on the three reservoirs. At this time, Clark Fork River Section 1 now ends at the Clark Fork's confluence with the Thompson River and anglers fishing downstream to the Idaho border are fishing one of three reservoirs (Thompson Falls, Noxon or Cabinet Gorge). This change was made to the 2015 MFWP mail-in estimates of angling pressure.

Lower Clark Fork reservoirs received the most angler pressure in 2015 from May 16 through September 30. Out-of-state anglers comprised a higher proportion of anglers on Cabinet Gorge Reservoir when compared to Noxon Reservoir, which is likely due to the proximity of Cabinet Gorge Reservoir to northern Idaho and eastern Washington. Angler demographic information suggests anglers that fish Noxon Reservoir are more likely to stay at area hotels, while anglers that fish Cabinet Gorge Reservoir are more likely to make day trips. Anglers that camp, stay in an RV or stay with friends/family comprise a similar portion of those interviewed on both reservoirs (about 30 to 50% based on species targeted). Cabinet Gorge Reservoir is physically less diverse than Noxon Reservoir as is evident by its lack of littoral habitat, and results from this survey indicate that based on species targeted, the fishery is less diverse as well.

As boating and angling pressure increase on the lower Clark Fork River reservoirs (PRC 2017), the threat of additional aquatic invasive species establishment also increases. This emphasizes the increased importance of education and the use of aquatic invasive species check-stations. The need for maintenance of recreational areas and angler access site improvements will also likely increase in the future (PRC 2017), outlining the importance of communication and planning between relevant stakeholders. One of the largest challenges in the future will be the maintenance of a diverse fishery that includes native salmonids and an evolving novel fish community (Scarnecchia et al. 2014).

Bass

The bass fishery in the lower Clark Fork reservoirs has increased in popularity and offers anglers the opportunity to catch both large fish and good numbers of fish. About 38% of interviewed

angling parties targeted Largemouth Bass, Smallmouth Bass or both species in 2015 on Noxon Reservoir. Smallmouth Bass were targeted at a higher rate and were more abundant in angler creels in both reservoirs when compared to Largemouth Bass. Anglers on Noxon Reservoir and Cabinet Gorge Reservoir caught 2.9 and 17.7 times more Smallmouth Bass compared to Largemouth Bass, respectively. The differences in the number of Largemouth Bass caught and targeted pressure compared to Smallmouth Bass are likely reflective of the physical differences between the two impoundments. Noxon Reservoir has more littoral habitat which is better suited for Largemouth Bass, while Smallmouth Bass habitat is abundant in both waterbodies.

The mean targeted overall catch rate for Smallmouth Bass was greater than Largemouth Bass on Noxon Reservoir; however, these catch rates were not significantly different from one another. The use of targeted catch rates is suggested when evaluating the quality of fishing for a certain species (Malvuesto 1983). Smallmouth Bass catch rates were higher on Noxon Reservoir compared to Cabinet Gorge Reservoir, and were higher than other regionally popular fisheries where such data exists, including Fort Peck (MFWP, unpublished data), Nelson Reservoir (Nagel 2015), the middle Missouri River downstream of Great Falls (Gardner and Wente 2008), Lake Roosevelt, Washington (Spotts et al. 2002) and Flaming Gorge Reservoir, Wyoming/Utah (Moseley et al. 2004) (Appendix D, Table D-1). However, Smallmouth Bass catch rates in the lower Clark Fork were lower than catch rates encountered on two north Idaho fisheries; Hayden Lake (IDFG 2010) and Coeur d' Alene Lake (IDFG 2011).

Documented regional Largemouth Bass catch rates were limited and were only available from three north Idaho fisheries (IDFG 2010, 2011) (Appendix D, Table D-2). The Noxon Reservoir catch rate was similar to the rate encountered on Coeur d' Alene Lake but was nearly 1 fish/hr lower than Hayden Lake and Lateral Lakes. It is difficult to assess how the lower Clark Fork River reservoirs compare to other fisheries in Montana and around the region for Largemouth Bass fishing because little creel data exists for the species.

Nearly 40% of angler groups interviewed during this creel survey targeted one or both species of bass, which may be an indication of the quality of the bass fishery. Noxon Reservoir currently has eight organized bass tournaments per year, and quality fish (> 380 mm), as defined by Gabelhouse 1984) are common for both species at tournament weigh-ins.

Harvest of Largemouth Bass and Smallmouth Bass on both reservoirs was relatively low and was within the range of harvest documented in other regional fisheries (Appendix D, Tables D-1 and D-2). An acceptable level of harvest that balances body condition, species abundance, the presence of large fecund adults and local conditions is presently unknown; however based on cursory evidence, if either species could sustain higher harvest it would likely be Smallmouth Bass. Based on the increased number of young Smallmouth Bass (< 279 mm) detected in the Thompson Falls fish ladder, angler catch, and annual gillnetting, there appears to be several highly successful year classes which have recruited into Noxon Reservoir since 2012 (MFWP, unpublished data, Kreiner and Tholl 2016). It is unknown whether this apparent increase in

Smallmouth Bass will impact growth or condition, but it is possible that some level of increased harvest on these age classes would benefit the population. Montana Fish, Wildlife and Parks plans to evaluate potential changes in growth rate and condition over time in relation to increasing abundances of bass and other species.

The influence of increased harvest on Largemouth Bass is also not understood and it is uncertain if increased harvest would sustain species abundance and catch rates, especially given variable recruitment and slow growth encountered on lower Clark Fork impoundments (Saffel 2000, 2003). While satisfaction with the current Largemouth Bass fishery appears high, there may be a trade-off between abundance, catch rates and the average size of fish caught. However, given the social popularity of catch and release fishing within specific angling groups, any analysis suggesting that increased harvest of one or both bass species would be beneficial to overall size structure in Noxon Reservoir would need to be clearly communicated and may not actually result in additional harvest.

The comparably cool climate of western Montana lies on the fringe of Largemouth Bass distribution which limits recruitment success and facilitates slow growth (Huston 1985, Walker-Smith 1995, Saffel 2003). The monitoring of fishing tournaments has been a valuable tool to better understand bass population dynamics, especially for Largemouth Bass, as the species is not especially susceptible to being caught in gillnets. Bass tournaments have been monitored on Noxon Reservoir since 1997 and eight were held on the reservoir in 2015. Long-term tournament data indicate mean lengths and proportion of quality fish (> 380 mm) for both bass species have increased overall since 2003, concomitant with increased angling pressure and the number of tournaments held each year (Kreiner and Tholl 2016). Despite this, the proportion of large Largemouth Bass (> 460 mm) weighed-in at tournaments peaked in 2003 at 23% and has ranged from 3% to 8% since. Some anglers have implicated over-harvest as the cause of decline for larger bass. However, this survey indicates that only 3% of harvested Largemouth Bass harvested were > 460 mm, which suggests the current level of harvest is not impacting the population of large bass. Because Noxon Reservoir is on the northern fringe of Largemouth Bass distribution which limits recruitment success and facilitates slow growth, preserving the shallow, weedy bays and backwater habitats critical for juvenile Largemouth Bass rearing is especially essential to maintain this fishery (Durocher et al. 1984).

Illegal bass harvest during restrictive period

Montana Fish, Wildlife and Parks has received many unconfirmed reports of anglers illegally harvesting bass during a restrictive period aimed at protecting spawning fish on Clark Fork River impoundments (June 15- July 15). A total of five interviews were obtained between the two reservoirs in which anglers reported keeping bass species during the restrictive period (Appendix D, Table D-3), when anglers were limited to harvesting one bass greater than 559 mm. None of the 31 reported fish harvested were greater than 559 mm in length. All offending angler parties were from Sanders or Lincoln counties, and a single angler accounted for over half of these

illegally harvested fish- a total which would have exceeded the limit at any point in the year. The harvest of small numbers of either bass species during the spawning season is not likely to negatively impact their populations, as both are abundant in Noxon Reservoir. However, this information does outline that there is a small subset of the local angling population that does not consult or choose to follow fishing regulations.

Walleye

Walleye were illegally introduced into the lower Clark Fork River system in Montana in the late 1980s or early 1990s (WWP 1995, Horn and Tholl 2010) and the population has become self-sustaining. The species is a top predator, may compete with other predators for prey and space and can reduce numbers of abundant fish genera and species including percids, cyprinids, catostomids and salmonids (Colby and Hunter 1989, McMahon 1992, Bramblet and Zale 2016). Walleye have very high reproductive potential and can become abundant under the right environmental conditions which can lead to a reduction in forage, gamefish species, and ultimately result in a high density, stunted Walleye population in suboptimal condition (McMahon 1992, Bramblet and Zale 2016).

In 2013, MFWP released an environmental assessment (EA) to investigate Walleye suppression in Noxon Reservoir due to the illegal nature of the introduction, declining trends in prey fish species, and concern for the future of the sportfishery (Kreiner and Tholl 2016). This EA was met with significant public opposition and the department issued a decision notice that more research was needed to answer questions raised in the public comment period before a final decision could be made. Subsequently, three studies were initiated by MFWP and funded by Avista through the Clark Fork Settlement Agreement (Avista 1999) to: 1) update case histories of the original Walleye Expansion in Montana EA (Colby and Hunter 1989) used to evaluate introduction of Walleye outside of their native range in Montana (Bramblet and Zale 2016); 2) create a predictive model to evaluate the future potential of Walleye in Noxon Reservoir if no suppression was to occur (Scarnecchia and Lim 2016); and 3) quantify the current value of the Noxon Reservoir fishery and how suppression, if instituted, could change the economic value of the reservoir fishery (Neher 2016). The angling information collected in this creel survey also provides an important component since a majority of public comments received during the EA process involved angling or angler harvest.

Anglers targeting Walleye comprised 10% of fishing parties interviewed on both reservoirs in 2015. Although Walleye were targeted and caught less often than both species of bass, Northern Pike, or Yellow Perch, they were harvested at a much higher rate than any other gamefish species. Approximately 85% of Walleye caught in both reservoirs were harvested by interviewed anglers. Anglers appear to be harvesting fish in the age 2-5 range (Appendix D, Figure D-1), based on multiple years of aging data from Noxon Reservoir (MFWP, unpublished data) and it appears the older age classes are either not being caught or not being harvested. However, this coincides with the most abundant year-classes commonly encountered during

annual fall gillnetting. Additionally, consumption guidelines based on mercury contamination recommend that anglers keep smaller Walleye.

Walleye spawning in Noxon Reservoir is limited to the upper 5% of the reservoir (Horn et al. 2009). Walleye begin to appear in numbers on the upper portion of Noxon Reservoir starting in March or early April, depending on river flows and water temperature (Horn et al. 2009, Kreiner and Tholl 2016). Many anglers target the species in April and May as adults are concentrated into a fairly small section of reservoir. After the spawning period, fish again become redistributed throughout the reservoir (Horn et al. 2009), presumably making them harder for many anglers to find. The overall targeted catch rate for Walleye was low, at 0.09 fish/hr. A catch rate of 0.30 fish/hr is considered good for fisheries in the U.S. and Canada (Bramblet and Zale 2016). The Noxon Reservoir Walleye catch rate is also lower than most other Montana fisheries (Appendix D, Table D-4). Observations and anecdotal accounts suggests angler interest may be increasing during the spawning run and it is during this period most anglers probably experience their best days of Walleye fishing (several anglers declined to be interviewed during this time period). As interest for the species continues to rise on Noxon Reservoir, presumably more anglers will begin to fish for Walleye throughout the summer and fall. The percentage of anglers that targeted recently established Walleye on Canyon Ferry Reservoir rose from 10% in 1997 to 50% in 2007 (Bramblet and Zale 2016). Over this time period angler catch rates also rose and peaked in 2011 (Bramblet and Zale 2016). Scarnecchia and Lim (2016) predicted that Walleye were not likely to dominate the Noxon Reservoir fish community based on trend data through 2015, and at most would comprise 5-15% of the fish community. Walleye recruitment in lower Clark Fork reservoirs is likely limited by water retention time in the reservoirs and the annual run-off regime (Kreiner and Tholl 2016, Scarnecchia and Lim 2016). These environmental limitations coupled with high harvest, steady to increasing angling pressure along with predation and competition exerted by other fish species may coalesce to keep Walleye at a low proportion of the fish community.

Northern Pike

Northern Pike were the single most popular fish species targeted on both Noxon and Cabinet Gorge reservoirs. Pike were targeted and harvested at a higher rate on Cabinet Gorge Reservoir, but were popular on both reservoirs. The results of this study and of a previous winter creel survey (Kreiner 2013), indicate that Northern Pike are likely the most common fish species targeted year-round on the lower Clark Fork reservoirs. Review of length frequency distributions from harvested Northern Pike on both reservoirs in 2015 and from 2013-2015 fall reservoir monitoring suggests a balanced size structure. The presence of a balanced size structure and a mean relative weight greater than 100 indicate the populations are not stunted, which is typified by high abundance of small sized Northern Pike, often referred to as “hammer handles”. Stunting may occur from high density of conspecifics, lack of appropriately sized or diverse prey species or above optimal thermal regimes (Diana 1987). Large Northern Pike can be found in both reservoirs, as demonstrated by a 14 kilogram individual taken through the ice in

early 2016. Catch rates for Northern Pike on lower Clark Fork reservoirs were generally higher than catch rates from other Montana and northern Idaho fisheries (Appendix D, Table D-5). Harvest rates were near the upper extent documented regionally, although significant variation existed in the multiyear data sets from Tiber Reservoir and Lake Frances (Appendix D, Table D-5). Harvest may contribute to the apparent health of Northern Pike in both reservoirs, although it is unclear how consumption advisory influence harvest of the species.

The lower Clark Fork Northern Pike fishery appears to balance good catch rates with the opportunity to catch large fish. Both reservoirs have an extensive open water-aquatic macrophyte ecotone along with a relatively diverse prey base, variables important for adult Northern Pike (Diana et al. 1977, Chapman and Mackay 1984, McMahon and Bennett 1996, Eklov 1997, Flinders and Bonar 2008). Abundant aquatic vegetation and other forms of habitat complexity are essential not only for juvenile Northern Pike rearing habitat (Inskip 1982, Holland and Huston 1984) but also to sustain prey abundance in a predator heavy system (Eklov 1997, Scarnecchia and Lim 2016).

Yellow Perch

Yellow Perch are both an important recreational and forage species in lower Clark Fork reservoirs. On both reservoirs, Yellow Perch were the third most popular fish species targeted by anglers. They also represent a significant component of the winter ice fishery, with Yellow Perch and/or Northern Pike targeted by 96% of anglers (Kreiner 2013). Based on regional comparisons, Yellow Perch catch rates on Noxon Reservoir (1.39 fish/hr) and Cabinet Gorge Reservoir (0.91 fish/hr) were relatively high (Appendix D, Table D-6). Of the 1,700 fish harvested on Noxon Reservoir, 52% were in the preferred size range (230-279) mm, < 1% were in the memorable range (280-330 mm) and no fish were harvested in the trophy range (> 330 mm) (Gabelhouse 1984). Large fish, greater than 279 mm, were extremely rare in the system and maybe limited by slow growth or harvest (McMahon 1992).

Reservoir monitoring data shows no clear trends in Yellow Perch abundance, relative weight or average length in either impoundment since the early 2000s, indicating a stable population. Long term gillnetting data indicates a wide fluctuation in the species abundance with no clear directional trend in fish/net in either reservoir (Kreiner and Tholl 2016). Relative weight from fish caught during annual fall gillnetting has hovered in the 80s and 90s but has never exceed 100, again with no clear directional trend (MFWP, unpublished data). Mean harvest length on Noxon Reservoir (214 mm) was slightly higher than mean length of Yellow Perch caught in gillnets on the reservoir between 2013 and 2015 (185-199 mm), but no clear trend in mean length of gillnetted fish was detected (MFWP unpublished data).

In Canyon Ferry Reservoir, the expansion of a recently established Walleye population resulted in dramatic declines in Yellow Perch abundance and catch rates. For example, prior to Walleye expansion in Canyon Ferry Reservoir a mean targeted catch rate of 2.30 fish/hr was observed

between 1986 and 2000 and that rate dropped to 1.20 fish/hr between 2000 and 2008 (Bramblet and Zale 2016). McMahon (1992) successfully predicted this effect on the population if Walleye were to be introduced. The author speculated that the lack of a well-vegetated littoral zone (prey refuge) in Canyon Ferry Reservoir would result in less catchable-size Yellow Perch. Conversely, in Noxon Reservoir it is believed that the presence of well-vegetated littoral zones has resulted in a stable population of perch, despite increasing numbers of predators in the reservoir (Scarnecchia and Lim 2016).

Yellow Perch likely represent an important prey component for some of the popular gamefish species targeted by anglers in the lower Clark Fork reservoirs. Yellow Perch have been shown to be important prey species for Northern Pike (Eklov 1997), Walleye (Yerk 2000), Largemouth Bass (Guy and Willis 1991) and a small component of Smallmouth Bass diet (Frey et al. 2003). Annual reservoir monitoring indicates that Yellow Perch comprised 37% to 44% of the gillnet catch in Noxon Reservoir between 2013 and 2015 (MFWP, unpublished data, Kreiner and Tholl 2016). It is likely that Yellow Perch year-class strength in lower Clark Fork run-of-the-river reservoirs probably oscillates in relation to intensity and magnitude of spring run-off, distribution and abundance of aquatic vegetation, and year-class strength of predators. Similar factors were believed to have influenced year-class strength in Canyon Ferry Yellow Perch prior to Walleye introduction (McMahon 1992). A drastic decline in native, soft-rayed prey species including Northern Pikeminnow, Peamouth and Largescale Sucker has occurred since standardized monitoring was instituted in 2000 (Kreiner and Tholl 2016). This reduction in prey base diversity may well have increased the importance of Yellow Perch and Pumpkinseed as prey species for top predators. Together, these two species have formed an increasing percentage of the total prey base and comprised from 51% to 68% of fish caught in reservoir netting efforts between 2013 and 2015 (Kreiner and Tholl 2016). Juvenile Yellow Perch and Pumpkinseed are commonly caught, and often very abundant, in the shallow weedy waters sampled during annual juvenile Largemouth Bass monitoring. Maintaining habitat complexity, especially aquatic vegetation and prey diversity will be essential to maintain sportfish diversity (Scarnecchia and Lim 2016).

Trout

Due to a lack of distinct thermal stratification, Lower Clark Fork reservoirs appear to provide marginal trout habitat during the summer months. This is evident when considering the numerous, unsuccessful attempts made to create salmonid-based sportfisheries in lower Clark Fork River impoundments from the 1950s through the 1980s (Huston 1965,1985).

Despite this, Bull Trout have been present in the reservoirs since their construction, and adfluvial, reservoir-origin fish have sustained migratory populations in tributaries of both reservoirs since the dams were built. Bull Trout are one of the most thermally sensitive salmonid species, thus conditions that can sustain adult Bull Trout would sustain other salmonid species. Between 2011 and 2016, the Thompson Falls fish ladder at Thompson Falls Dam which forms

the upstream barrier of Noxon Reservoir, has caught over 2,700 salmonids moving upstream, representing 7 different species (along with 2 hybrid complexes) (MFWP, unpublished data). Rainbow Trout are by far the most numerous species caught at the fish ladder representing about 52% of the salmonid catch, followed by Brown Trout (24%), Mountain Whitefish (13%) and Westslope Cutthroat Trout (7%). The number of individual salmonids caught in a year at the ladder has ranged from 240 in 2011 to 624 in 2016 (MFWP, unpublished data). Some individuals have been captured over the course of multiple years making this upstream migration, suggesting these individuals may choose to move downstream following upstream forays, possibly because the reservoir offers a productive maturation and/or overwintering habitat. The fish ladder data indicate salmonids can and do survive in Noxon Reservoir; however, creel data suggests a salmonid fishery is essentially non-existent. Of anglers interviewed in 2015, 1.5% targeted salmonids on Noxon Reservoir and 4.2% on Cabinet Gorge Reservoir. This surveyed documented 30 salmonids caught of the 11,500 fish recorded caught by interviewed anglers on Noxon Reservoir. Nearly half were either Lake Whitefish or Mountain Whitefish, although we did not differentiate due to perceived inability of many anglers to correctly distinguish between species. Ten salmonids were caught on Cabinet Gorge Reservoir, five of which were whitefish, of the over 900 fish reported caught by anglers.

Only seven Westslope Cutthroat Trout were caught by interviewed anglers on both reservoirs, combined. On Noxon Reservoir, two of the six fish caught were harvested and the lone fish caught on Cabinet Gorge Reservoir was released with no mentioned of the fish being tagged. A radio-tagged Cutthroat was found dead and cut open in Bull River Bay near the mouth of the Bull River (Bernall and Johnson 2016); however, it is unclear if an angler killed this fish or if the fish was found dead and subsequently opened. Other mortalities occurred while fish were in Cabinet Gorge Reservoir and while some were attributed to birds of prey, the other causes of death were unknown. One of the main reasons for conducting the creel survey on Cabinet Gorge Reservoir was to provide baseline data on the Westslope Cutthroat Trout fishery during the experimental stage of passage upstream of Cabinet Gorge Dam. Based on this survey's findings little can be said about its influence on the fishery with only one fish caught in the reservoir during the study period. It is likely the best opportunity for anglers to catch these fish would be near the mouth of tributary streams or in the streams themselves.

Bull River

A total 25 interviews were collected on the Bull River between May 16 and the end of November. Only nine complete interviews were obtained. Limited public access to the mainstem Bull River and an active fire season in August and September of 2015 likely limited the number of anglers fishing this waterbody. Additionally, because of the channel-type, the Bull River is more effectively fished from a non-motorized boat. The low-water in 2015 limited the window in which the river was floatable, and efforts to collect angling data from outfitters were unsuccessful. It is unclear if more distinct patterns in angler-use would have been apparent under different conditions (e.g., higher flows, no fire).

The Bull River is an underutilized fishery in a beautiful valley surrounded by prominent mountains. Unfortunately, the limited amount of angling information collected in this survey did not provide much additional insight into the fishery. Interviewed anglers captured a total of 23 fish on the Bull River: 18 Westslope Cutthroat Trout, 3 Brown Trout and 2 Bull Trout. Because released fish were not observed by creel clerks, it is possible that the two reported Bull Trout were actually misidentified Brook Trout which can be common in portions of the Bull River. Westslope Cutthroat Trout comprised the majority of fish caught; however, none of these fish were reported as being tagged.

Westslope Cutthroat Trout, Mountain Whitefish, Brown Trout, and Brook Trout are salmonid species common in the Bull River. A comprehensive fisheries sampling effort including tributary streams occurred in the Bull River drainage in 2005 and 2014 (Moran and Storaasli 2006, 2015). Portions of the mainstem river have been electrofished, although ineffectively (Moran and Storaasli 2015). In the future, alternative methods should be investigated to effectively monitor the cutthroat fishery in the lower (C channel) and upper (E channel) portions of the mainstem Bull River. The mainstem Bull River runs primarily through private property, and public access is limited. Efforts should be made to procure additional properties, especially: 1) large intact parcels that would allow for walk-in access (such as the Woodduck property previously purchased by Avista); and 2) boating put-in/take-out access sites.

Recommendations

- Conduct a subsequent creel survey on Noxon Reservoir in 5 to 10 years, given the popularity of the fishery and the complex fish community. The sampling design from this survey should be used so data is directly comparable and so that meaningful conclusions and comparisons can be made.

- Future creel surveys should focus solely on a single waterbody per sample year to maximize the amount of data collected. Larger data sets will be important in reducing variation.

- It will be important to monitor how transport of Westslope Cutthroat Trout above Cabinet Gorge Dam influences the recreational fishery, especially in the Bull River drainage. It is still unclear what full-scale passage will look like for the species and how to improve angler participation in creel efforts in the Bull River. A multistep approach that includes a roving creels survey, mail-in angler surveys, and participations of specific angler groups such as guides/outfitters, and landowners, through the use daily fishing logs could help collect more information than what was obtained during this survey. Fishing data from multiple sources could be paired with scientific data from PIT tag arrays and other emerging technologies in effort to better understand the influence of upstream passage on the fishery.

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Appendix A- Analysis of instantaneous anglers counts for aerial surveys

TABLE A-1. Two sample t-test to evaluate mean instantaneous anglers counts conducted via fixed wing aircraft on Noxon Reservoir.

	Aerial Angler counts on Noxon Reservoir					
Period	**Angler Type**	**Weekday**	**Weekend-Holiday**	**df**	**T-Stat**	**P-value**
April 1-May 15	Boat	10.85	19.87	8.39	0.92	0.38
	Shore	1.14	0.88	13.00	-0.35	0.73
May 16- June 30	Boat	20.80	36.89	12.00	1.60	0.14
	Shore	1.20	1.67	12.00	0.54	0.60
July 1- August 15	Boat	24.25	51.00	18.00	2.53	**0.02**
	Shore	1.13	1.58	18.00	0.76	0.46
August 16- September 30	Boat	20.00	38.92	15.00	1.44	0.17
	Shore	1.60	1.25	15.00	0.34	0.74
October 1-November 30	Boat	5.17	7.12	12.00	0.37	0.72
	Shore	0.00	0.38	12.00	0.85	0.41

TABLE A-2. Two sample t-test for mean instantaneous anglers counts conducted via fixed wing aircraft on Cabinet Gorge Reservoir.

	Aerial Angler counts on Cabinet Gorge Reservoir					
Period	**Angler Type**	**Weekday**	**Weekend-Holiday**	**df**	**T-Stat**	**P-value**
April 1-May 15	Boat	3.00	1.50	13.00	-1.21	0.24
	Shore	0.57	0.13	7.02	-1.00	0.35
May 16- June 30	Boat	2.6	4.4	12.00	1.11	0.29
	Shore	0.00	0.44	8.00	1.00	0.35
July 1- August 15	Boat	4.75	7.25	18.00	1.44	0.17
	Shore	0.00	0.17	11.00	1.48	0.17
August 16- September 30	Boat	2.60	4.92	15.00	1.56	0.14
	Shore	0.00	0.00	15.00	-	-
October 1-November 30	Boat	2.33	0.63	12.00	-1.67	0.12
	Shore	0.00	0.00	12.00	-	-

TABLE A-3. One-way analysis of variance (ANOVA) with pairwise Tukey comparisons among six-week periods of means from instantaneous anglers counts conducted via fixed wing aircraft on Noxon Reservoir for boat and shore anglers.

Noxon Reservoir-Boat		
Pairwise Comparisons	**T-stat**	**P-value**
Aug16-Sept30 - April1-May15	2.32	0.15
July1-Aug15 - April1-May15	3.34	**0.01**
May16-June30 - April1-May15	1.93	0.31
Oct-Nov - April1-May15	-1.17	0.77
July1-Aug15 - Aug16-Sept30	0.98	0.86
May16-June30 - Aug16-Sept30	-0.28	1.00
Oct-Nov - Aug16-Sept30	-3.48	**0.01**
May16-June30 - July1-Aug15	-1.22	0.74
Oct-Nov - July1-Aug15	-4.53	**<0.01**
Oct-Nov - May16-June30	-3.05	**0.03**

Noxon Reservoir-Shore		
Pairwise Comparisons	**T-stat**	**P-value**
Aug16-Sept30 - April1-May15	0.69	0.96
July1-Aug15 - April1-May15	0.82	0.93
May16-June30 - April1-May15	0.94	0.88
Oct-Nov - April1-May15	-1.47	0.58
July1-Aug15 - Aug16-Sept30	0.10	1.00
May16-June30 - Aug16-Sept30	0.28	1.00
Oct-Nov - Aug16-Sept30	-2.20	0.19
May16-June30 - July1-Aug15	0.20	1.00
Oct-Nov - July1-Aug15	-2.37	0.14
Oct-Nov - May16-June30	-2.37	0.14

TABLE A-4. One-way analysis of variance (ANOVA) with pairwise Tukey comparisons among six-week periods of means from instantaneous anglers counts conducted via fixed wing aircraft on Cabinet Gorge Reservoir for boat and shore anglers.

Cabinet Gorge-Boat		
Pairwise Comparisons	**T-stat**	**P-value**
Aug16-Sept30 - April1-May15	1.91	0.32
July1-Aug15 - April1-May15	3.94	**<0.01**
May16-June30 - April1-May15	1.42	0.62
Oct-Nov - April1-May15	-0.75	0.94
July1-Aug15 - Aug16-Sept30	2.03	0.26
May16-June30 - Aug16-Sept30	-0.41	0.99
Oct-Nov - Aug16-Sept30	-2.65	**0.07**
May16-June30 - July1-Aug15	-2.35	0.14
Oct-Nov - July1-Aug15	-4.67	**< 0.01**
Oct-Nov - May16-June30	-2.14	0.22

Cabinet Gorge-Shore		
Pairwise Comparisons	**T-stat**	**P-value**
Aug16-Sept30 - April1-May15	-1.60	0.50
July1-Aug15 - April1-May15	-1.16	0.77
May16-June30 - April1-May15	-0.22	1.00
Oct-Nov - April1-May15	-1.52	0.55
July1-Aug15 - Aug16-Sept30	0.52	0.99
May16-June30 - Aug16-Sept30	1.35	0.66
Oct-Nov - Aug16-Sept30	0.00	1.00
May16-June30 - July1-Aug15	0.91	0.89
Oct-Nov - July1-Aug15	-0.49	0.99
Oct-Nov - May16-June30	-1.28	0.70

TABLE A-5. One-way analysis of variance (ANOVA) with pairwise Tukey comparisons among six-week periods of means from instantaneous anglers counts conducted via fixed wing aircraft on the Bull River in 2015 for boat and shore anglers.

Bull River-Boat		
Pairwise Comparisons	**T-stat**	**P-value**
July1-Aug15 - Aug16-Sept30	1.18	0.64
May16-June30 - Aug16-Sept30	1.08	0.70
Oct-Nov - Aug16-Sept30	-0.05	1.00
May16-June30 - July1-Aug15	0.00	1.00
Oct-Nov - July1-Aug15	-1.48	0.45
Oct-Nov - May16-June30	-1.31	0.56

Bull River-Shore		
Pairwise Comparisons	**T-stat**	**P-value**
July1-Aug15 - Aug16-Sept30	0.92	0.79
May16-June30 - Aug16-Sept30	0.97	0.76
Oct-Nov - Aug16-Sept30	-0.14	1.00
May16-June30 - July1-Aug15	0.16	1.00
Oct-Nov - July1-Aug15	-1.29	0.57
Oct-Nov - May16-June30	-1.29	0.57

Appendix B- Noxon Reservoir summary data

TABLE B-1. County of origin for Montana-resident angler parties interviewed at Noxon Reservoir (n=1116). The sample size (n) represents the number of interviews.

MT Angler Origin by County: Noxon		
County	n	%
Sanders	520	46.6
Missoula	198	17.7
Ravalli	125	11.2
Lincoln	74	6.6
Mineral	55	4.9
Flathead	52	4.7
Lake	33	3.0
Gallatin	20	1.8
Deer Lodge	8	0.7
Lewis & Clark	7	0.6
Silver Bow	6	0.5
Cascade	4	0.4
Yellowstone	4	0.4
Jefferson	2	0.2
Powell	2	0.2
Broadwater	2	0.2
Glacier	1	0.1
Granite	1	0.1
Belknap	1	0.1
Dawson	1	0.1

TABLE B-2. Angler catch statistics from interviewed anglers for Noxon Reservoir including species, number of fish harvested, number of fish released and harvest rate.

Noxon Reservoir, April-November 2015			
Species	# Harvested	# Released	Harvest Rate (%)
Bullhead spp.	1	7	12.5
Brown Trout	1	1	50.0
Largemouth Bass	37	1003	3.6
Sucker spp.	0	2	0.0
Lake Trout	1	1	50.0
Whitefish spp.	2	11	15.4
Northern Pike	298	534	35.8
Northern Pikeminnow	12	112	9.7
Peamouth	0	10	0.0
Pumpkinseed	118	1094	9.7
Rainbow trout	1	6	14.3
Smallmouth Bass	355	2619	11.9
Westslope Cutthroat Trout	2	4	33.3
Walleye	121	23	84.0
Yellow Perch	1700	3408	33.3

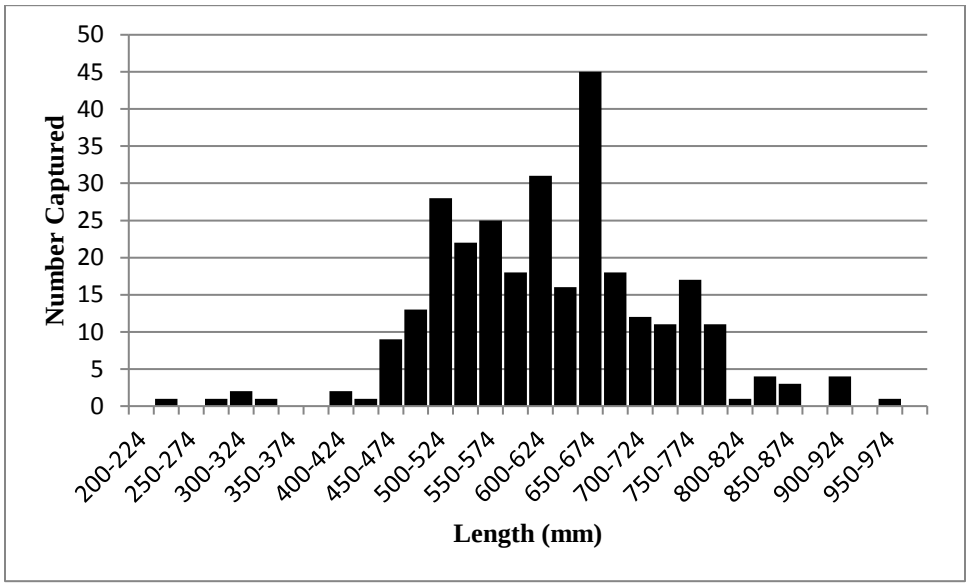

FIGURE B-1. Length frequency histogram for Northern Pike harvested by anglers on Noxon Reservoir (n=297). Fish were measured to the nearest inch in the field and converted to millimeters.

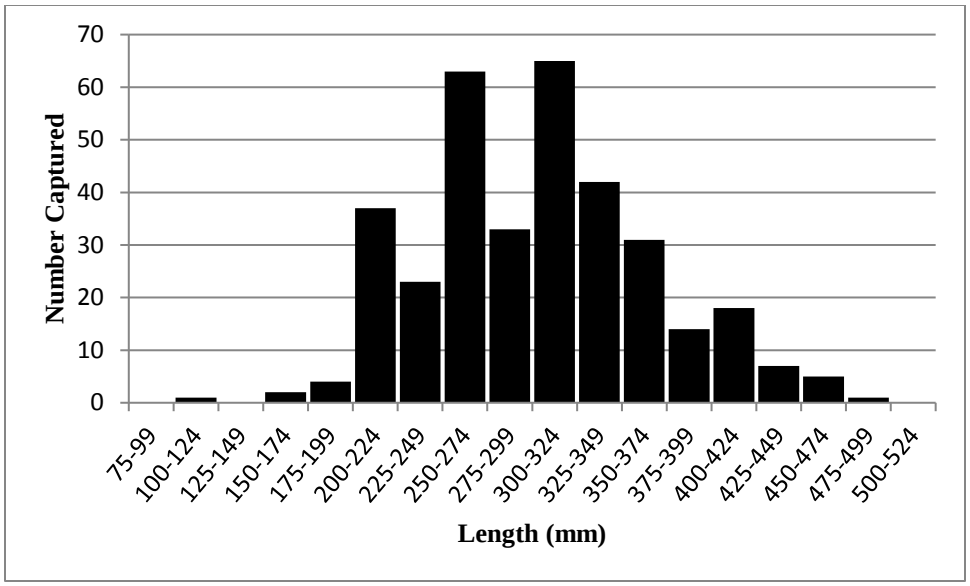

Figure B-2. Length frequency histogram for Smallmouth Bass harvested by anglers on Noxon Reservoir (n=346). Fish were measured to the nearest inch in the field and converted to millimeters.

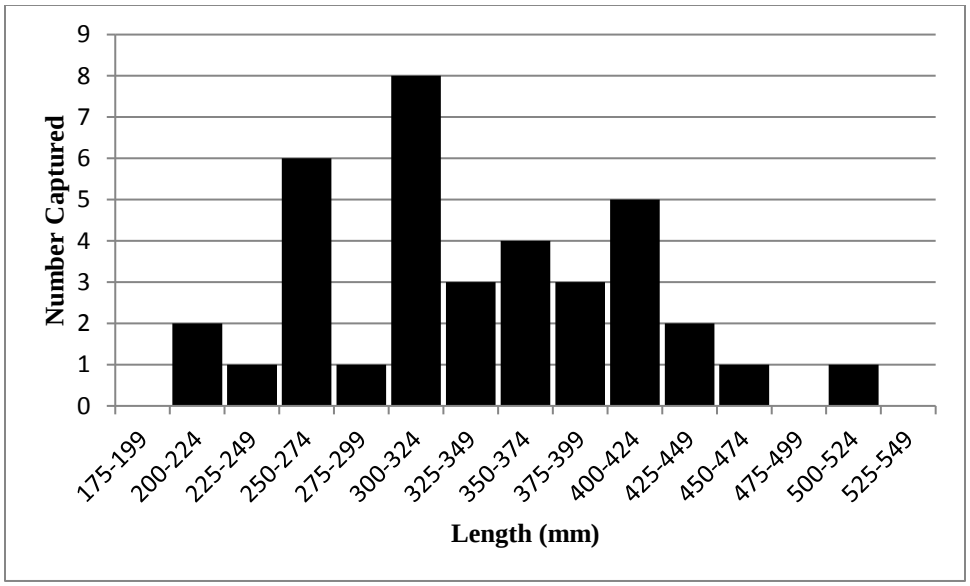

FIGURE B-3. Length frequency histogram for Largemouth Bass harvested by anglers on Noxon Reservoir (n=37). Fish were measured to the nearest inch in the field and converted to millimeters.

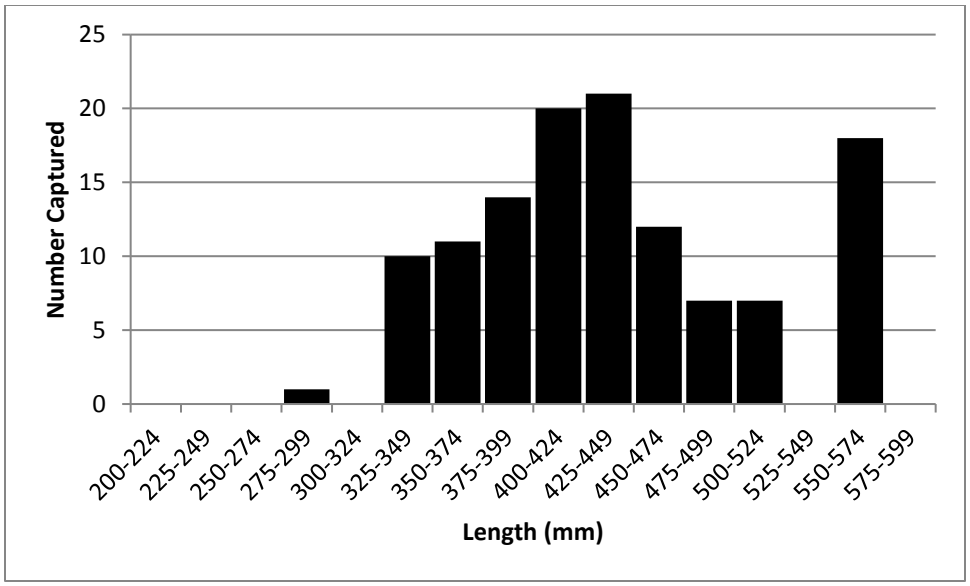

Figure B-4. Length frequency histogram for Walleye harvested by anglers on Noxon Reservoir (n=121). Fish were measured to the nearest inch in the field and converted to millimeters.

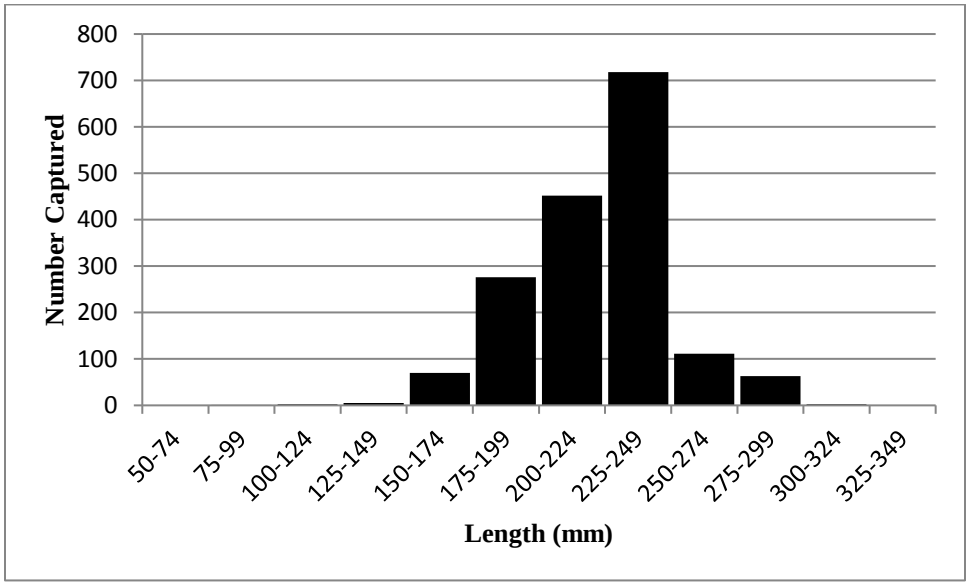

FIGURE B-5. Length frequency histogram for Yellow Perch harvested by anglers on Noxon Reservoir (n=1700). Fish were measured to the nearest inch in the field and converted to millimeters.

TABLE B-3. Mean catch rate and harvest rate (proportion of fish caught that were harvested) for boat and shore anglers targeting a given species per period on Noxon Reservoir. Sample size (n) for catch rate represents the number of days where angler groups targeted or caught a given species within the specified period. Sample size (n) for harvest rate represents the number of days where angler groups caught or harvested a given species within the specified period. The species group, Bass, represents anglers that were targeting both species and thus catch rate and harvest rate are a combination of both species.

Period	Angler Type	Species	Mean Targeted Catch Rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
April 1-May 15	Boat	NP	0.08	15	0.06	0.35	9	0.23
May 16-June 30	Boat	NP	0.11	23	0.06	0.44	21	0.17
July 1-Aug 15	Boat	NP	0.21	27	0.08	0.25	25	0.12
Aug 16-Sept 30	Boat	NP	0.19	32	0.07	0.32	28	0.12
Oct 1-Nov 30	Boat	NP	0.20	16	0.17	0.43	11	0.26
April 1-May 15	Shore	NP	0.07	15	0.07	0.67	6	0.41
May 16-June 30	Shore	NP	0.06	16	0.07	1.00	3	-
July 1-Aug 15	Shore	NP	0.15	12	0.15	0.25	4	0.49
Aug 16-Sept 30	Shore	NP	0.26	10	0.39	0.67	3	0.55
Oct 1-Nov 30	Shore	NP	0.05	14	0.07	0.50	2	0.70
April 1-May 15	Boat	SMB	0.31	14	0.24	0.20	12	0.22
May 16-June 30	Boat	SMB	0.64	18	0.23	0.01	19	0.02
July 1-Aug 15	Boat	SMB	0.60	30	0.13	0.17	29	0.09
Aug 16-Sept 30	Boat	SMB	0.76	25	0.30	0.22	25	0.11
Oct 1-Nov 30	Boat	SMB	0.74	8	0.28	0.16	8	0.24
April 1-May 15	Shore	SMB	0.28	6	0.29	0.00	4	-
May 16-June 30	Shore	SMB	0.68	7	0.38	0.18	7	0.28
July 1-Aug 15	Shore	SMB	1.24	15	0.97	0.12	13	0.16
Aug 16-Sept 30	Shore	SMB	0.36	4	0.27	0.00	3	0.00
Oct 1-Nov 30	Shore	SMB	1.28	4	0.73	0.25	4	0.49
April 1-May 15	Boat	LMB	0.36	10	0.31	0.00	10	-
May 16-June 30	Boat	LMB	0.75	17	0.44	0.08	17	0.12
July 1-Aug 15	Boat	LMB	0.25	24	0.10	0.09	20	0.10
Aug 16-Sept 30	Boat	LMB	0.37	14	0.16	0.05	14	0.09
Oct 1-Nov 30	Boat	LMB	0.76	11	0.44	0.17	12	0.23
April 1-May 15	Shore	LMB	1.12	1	-	0.00	1	-
May 16-June 30	Shore	LMB	1.19	12	0.71	0.20	12	0.28
July 1-Aug 15	Shore	LMB	0.68	8	0.81	0.18	7	0.28
Aug 16-Sept 30	Shore	LMB	0.51	5	0.55	0.00	2	-
Oct 1-Nov 30	Shore	LMB	0.00	1	-	-	0	-

Period	Angler Type	Species	Mean Targeted Catch Rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
April 1-May 15	Boat	WE	0.07	14	0.06	0.78	6	0.29
May 16-June 30	Boat	WE	0.10	22	0.05	0.86	14	0.19
July 1-Aug 15	Boat	WE	0.15	24	0.12	0.72	15	0.22
Aug 16-Sept 30	Boat	WE	0.03	22	0.03	1.00	6	0.00
Oct 1-Nov 30	Boat	WE	0.01	5	0.02	1.00	1	0.00
April 1-May 15	Shore	WE	0.00	-	-	-	-	-
May 16-June 30	Shore	WE	0.16	2	-	1.00	-	-
July 1-Aug 15	Shore	WE	0.00	-	-	-	-	-
Aug 16-Sept 30	Shore	WE	0.00	-	-	-	-	-
Oct 1-Nov 30	Shore	WE	0.00	-	-	-	-	-
April 1-May 15	Boat	YP	1.32	14	0.65	0.68	13	0.19
May 16-June 30	Boat	YP	0.74	19	0.37	0.13	16	0.13
July 1-Aug 15	Boat	YP	0.96	26	0.46	0.26	36	0.10
Aug 16-Sept 30	Boat	YP	2.15	26	1.16	0.37	24	0.13
Oct 1-Nov 30	Boat	YP	1.81	10	1.45	0.27	10	0.23
April 1-May 15	Shore	YP	2.11	9	2.65	0.68	6	0.29
May 16-June 30	Shore	YP	1.75	18	2.13	0.36	15	0.21
July 1-Aug 15	Shore	YP	2.33	14	2.11	0.24	12	0.21
Aug 16-Sept 30	Shore	YP	3.32	14	2.38	0.31	12	0.23
Oct 1-Nov 30	Shore	YP	0.47	7	0.39	0.00	4	0.00
April 1-May 15	Boat	Bass	0.43	7	0.12	0.12	5	0.24
May 16-June 30	Boat	Bass	0.28	19	0.05	0.05	11	0.05
July 1-Aug 15	Boat	Bass	0.51	7	0.00	0.00	4	-
Aug 16-Sept 30	Boat	Bass	0.93	11	0.04	0.04	8	0.05
Oct 1-Nov 30	Boat	Bass	0.95	5	0.00	0.00	4	-
April 1-May 15	Shore	Bass	0.96	7	0.00	0.00	3	-
May 16-June 30	Shore	Bass	0.33	13	0.28	0.28	4	0.47
July 1-Aug 15	Shore	Bass	1.37	8	0.00	0.00	3	-
Aug 16-Sept 30	Shore	Bass	0.06	13	0.00	0.00	2	-
Oct 1-Nov 30	Shore	Bass	0.91	3	0.00	0.00	1	-
April 1-May 15	Boat	Other	1.13	2	2.21	0.00	1	-
May 16-June 30	Boat	Other	1.39	3	1.59	0.17	6	0.33
July 1-Aug 15	Boat	Other	0.20	19	0.08	0.15	35	0.11
Aug 16-Sept 30	Boat	Other	0.55	16	0.24	0.09	25	0.11
Oct 1-Nov 30	Boat	Other	0.57	4	0.97	0.00	3	-
April 1-May 15	Shore	Other	0.45	3	0.62	0.90	3	0.20
May 16-June 30	Shore	Other	1.91	14	1.67	0.18	17	0.19
July 1-Aug 15	Shore	Other	2.20	11	1.02	0.08	12	0.16

Period	Angler Type	Species	Mean Targeted catch rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
Aug 16-Sept 30	Shore	Other	1.16	11	1.03	0.02	6	0.05
Oct 1-Nov 30	Shore	Other	0.70	4	0.83	0.00	2	-

TABLE B-4. Overall estimates of fish species caught stratified by period and angler type in Noxon Reservoir. Estimates are based on mean daily counts from flight data, mean daylight, the number of days per period and mean overall catch rate of the six-week period.

Period	Angler Type	Species	Mean Overall Catch Rate (#/hr)	# Fish	95% CI (+/-)
April 1-May 15	Boat	NP	0.11	1046.90	841.42
May 16-June 30	Boat	NP	0.13	2892.75	1389.72
July 1-Aug 15	Boat	NP	0.26	7399.34	2978.27
Aug 16-Sept 30	Boat	NP	0.21	4151.46	1696.43
Oct 1-Nov 30	Boat	NP	0.23	896.40	821.46
April 1-May 15	Shore	NP	0.20	125.21	165.30
May 16-June 30	Shore	NP	0.04	47.57	49.77
July 1-Aug 15	Shore	NP	0.29	288.43	406.52
Aug 16-Sept 30	Shore	NP	0.25	209.46	303.76
Oct 1-Nov 30	Shore	NP	0.05	5.83	14.51
April 1-May 15	Boat	SMB	0.20	1988.91	1662.56
May 16-June 30	Boat	SMB	0.50	11374.55	4686.23
July 1-Aug 15	Boat	SMB	0.86	24186.25	8272.04
Aug 16-Sept 30	Boat	SMB	0.74	14698.68	6806.68
Oct 1-Nov 30	Boat	SMB	0.74	2842.37	2556.83
April 1-May 15	Shore	SMB	0.22	142.47	186.05
May 16-June 30	Shore	SMB	0.56	613.95	511.98
July 1-Aug 15	Shore	SMB	1.52	1493.35	1383.30
Aug 16-Sept 30	Shore	SMB	0.31	258.69	238.71
Oct 1-Nov 30	Shore	SMB	0.57	70.09	161.11
April 1-May 15	Boat	LMB	0.36	3597.43	3471.05
May 16-June 30	Boat	LMB	0.44	9883.77	4668.80
July 1-Aug 15	Boat	LMB	0.31	8731.16	3612.29
Aug 16-Sept 30	Boat	LMB	0.25	4900.84	2466.03
Oct 1-Nov 30	Boat	LMB	0.88	3420.41	3402.60
April 1-May 15	Shore	LMB	0.37	234.46	312.64
May 16-June 30	Shore	LMB	0.61	658.27	512.10
July 1-Aug 15	Shore	LMB	0.27	265.85	293.72
Aug 16-Sept 30	Shore	LMB	0.28	232.98	262.55
Oct 1-Nov 30	Shore	LMB	0.09	11.16	32.05
April 1-May 15	Boat	WE	0.06	646.27	639.33
May 16-June 30	Boat	WE	0.11	2555.89	1449.72
July 1-Aug 15	Boat	WE	0.11	3047.41	2263.49

Period	Angler Type	Species	Mean Overall Catch Rate (#/hr)	# Fish	95% CI (+/-)
Aug 16-Sept 30	Boat	WE	0.03	678.21	490.09
Oct 1-Nov 30	Boat	WE	0.01	38.24	80.78
April 1-May 15	Shore	WE	-	-	-
May 16-June 30	Shore	WE	0.16	170.43	289.45
July 1-Aug 15	Shore	WE	-	-	-
Aug 16-Sept 30	Shore	WE	-	-	-
Oct 1-Nov 30	Shore	WE	-	-	-
April 1-May 15	Boat	YP	1.18	11720.28	8833.72
May 16-June 30	Boat	YP	0.97	21805.98	10523.93
July 1-Aug 15	Boat	YP	1.01	28480.63	11452.54
Aug 16-Sept 30	Boat	YP	2.17	43165.37	24003.01
Oct 1-Nov 30	Boat	YP	1.22	4713.40	4994.28
April 1-May 15	Shore	YP	1.58	1000.39	1199.96
May 16-June 30	Shore	YP	0.99	1082.22	849.61
July 1-Aug 15	Shore	YP	1.61	1577.54	1332.44
Aug 16-Sept 30	Shore	YP	1.80	1505.52	1156.09
Oct 1-Nov 30	Shore	YP	0.89	109.72	249.34
April 1-May 15	Boat	Other	0.26	2560.15	3104.46
May 16-June 30	Boat	Other	0.47	10515.63	7355.00
July 1-Aug 15	Boat	Other	0.47	13202.38	6114.77
Aug 16-Sept 30	Boat	Other	0.71	14208.12	7104.97
Oct 1-Nov 30	Boat	Other	0.59	2285.37	2978.23
April 1-May 15	Shore	Other	0.48	306.39	331.87
May 16-June 30	Shore	Other	1.54	1673.60	1351.25
July 1-Aug 15	Shore	Other	1.97	1933.42	1217.27
Aug 16-Sept 30	Shore	Other	1.27	1059.02	947.98
Oct 1-Nov 30	Shore	Other	0.56	68.26	166.95
Total				**276,778.85**	**154,647.03**

Appendix C- Cabinet Gorge Reservoir summary data

TABLE C-1. County of origin for Montana-resident angler parties interviewed Cabinet Gorge Reservoir (n=153). The sample size (n) represents the number of interviews not the total number of anglers.

MT Angler Origin by County: Cabinet Gorge		
County	n	%
Sanders	83	54.2
Lincoln	31	20.3
Missoula	14	9.2
Flathead	9	5.9
Ravalli	3	2.0
Gallatin	2	1.3
Glacier	2	1.3
Lake	2	1.3
Lewis & Clark	2	1.3
Beaverhead	1	0.7
Cascade	1	0.7
Fergus	1	0.7
Mineral	1	0.7
Powell	1	0.7

TABLE C-2. Angler catch statistics from interviewed anglers for Cabinet Gorge Reservoir including species, number of fish harvested, number of fish released and harvest rate.

Cabinet Gorge Reservoir, April-November 2015			
Species	**# Harvested**	**# Released**	**Harvest Rate (%)**
Bull Trout	0	1	0.0
Largemouth Bass	1	17	5.6
Sucker spp.	3	2	60.0
Lake Trout	0	1	0.0
Whitefish spp.	2	3	40.0
Northern Pike	78	111	41.3
Northern Pikeminnow	5	26	16.1
Rainbow trout	0	2	0.0
Smallmouth Bass	26	292	8.2
Westslope Cutthroat Trout	1	0	100.0
Walleye	30	5	85.7
Yellow Perch	61	274	18.2

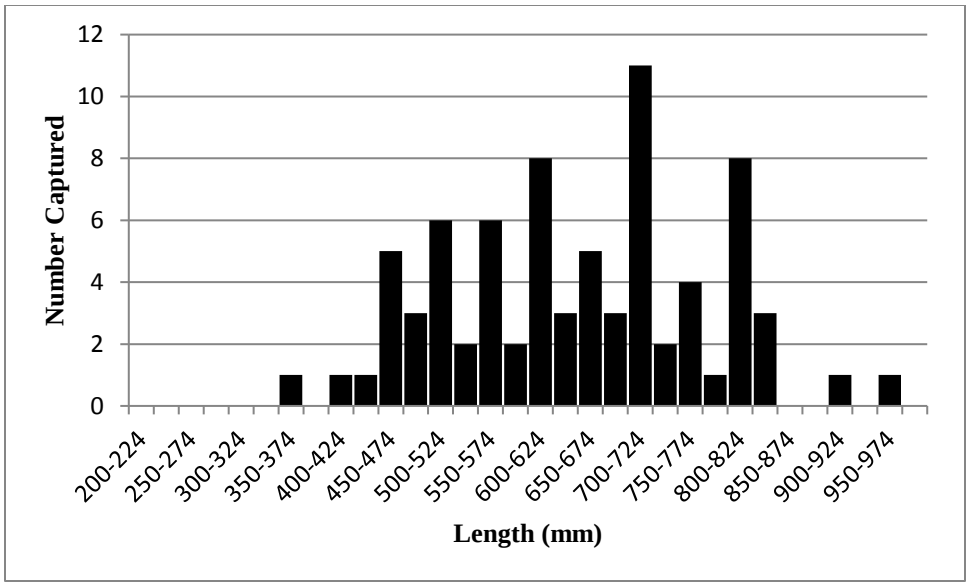

FIGURE C-1. Length frequency histogram for Northern Pike harvested by anglers on Cabinet Gorge Reservoir (n=77). Fish were measured to the nearest inch in the field and converted to millimeters.

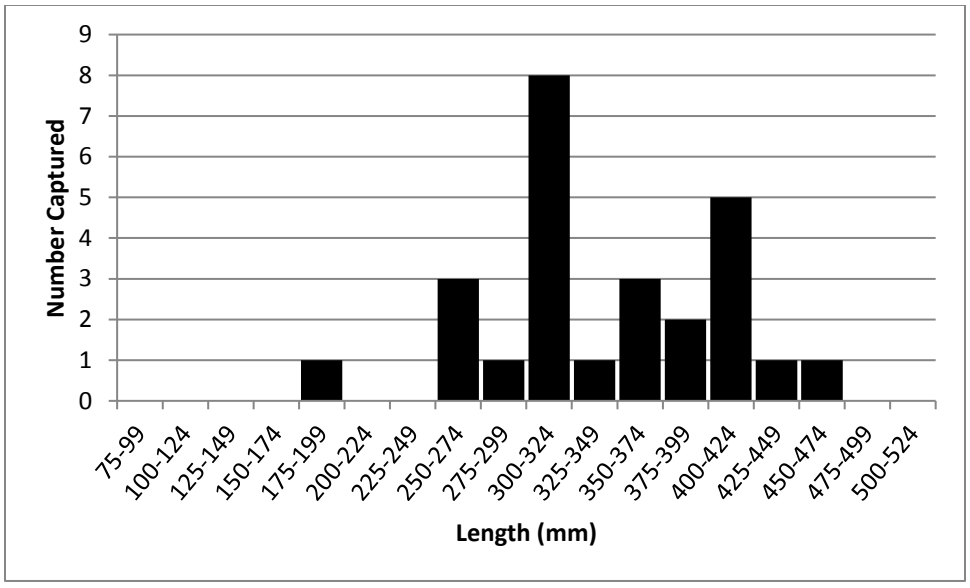

FIGURE C-2. Length frequency histogram for Smallmouth Bass harvested by anglers on Cabinet Gorge Reservoir (n=26). Fish were measured to the nearest inch in the field and converted to millimeters.

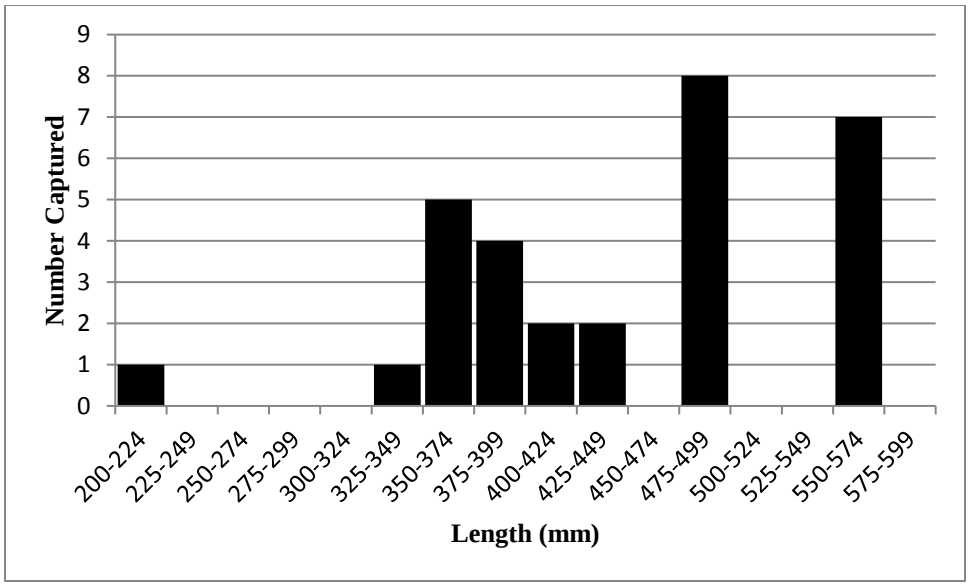

FIGURE C-3. Length frequency histogram for Walleye harvested by anglers on Cabinet Gorge Reservoir (n=30). Fish were measured to the nearest inch in the field and converted to millimeters.

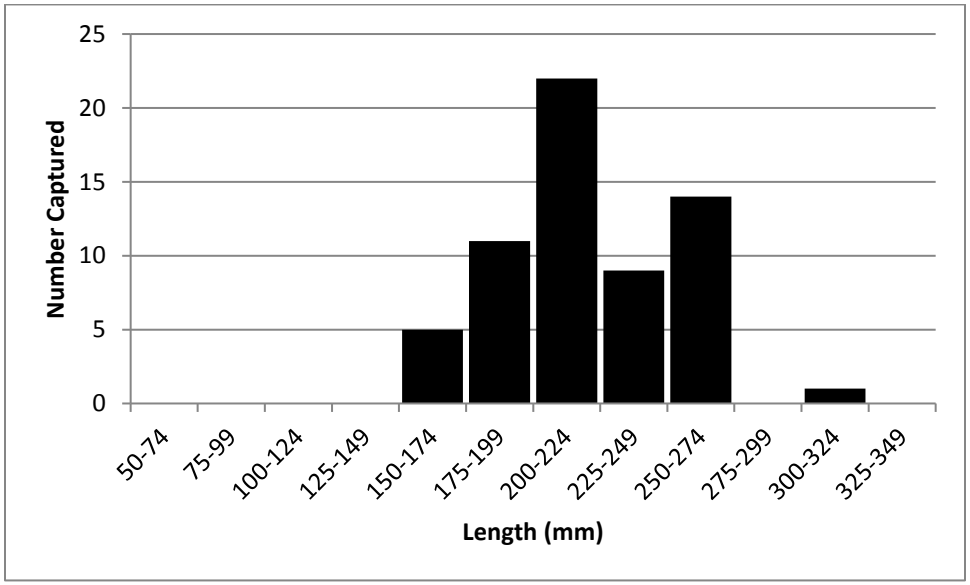

FIGURE C-4. Length frequency histogram for Yellow Perch harvested by anglers on Cabinet Gorge Reservoir (n=62). Fish were measured to the nearest inch in the field and converted to millimeters.

TABLE C-3. Mean catch rate and harvest rate (proportion of fish caught that were harvested) for boat and shore anglers targeting a given species per period on Cabinet Gorge Reservoir. Sample size (n) for catch rate represents the number of days where anglers targeted or caught a given species within the specified period. Sample size (n) for harvest rate represents the number of days where angler caught or harvested a given species within the specified period. The species group, Bass, represents anglers that were targeting both species and thus catch rate and harvest rate are a combination of both species.

Period	Angler Type	Species	Mean Targeted Catch Rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
April 1-May 15	Boat	NP	0.33	4	0.47	0.41	2	0.80
May 16-June 30	Boat	NP	0.25	13	0.11	0.59	13	0.27
July 1-Aug 15	Boat	NP	0.32	9	0.33	0.49	7	0.32
Aug 16-Sept 30	Boat	NP	0.21	9	0.17	0.50	8	0.37
Oct 1-Nov 30	Boat	NP	0.09	6	0.06	0.51	4	0.46
April 1-May 15	Shore	NP	0.11	5	0.16	0.17	2	0.33
May 16-June 30	Shore	NP	0.38	8	0.39	0.47	5	0.44
July 1-Aug 15	Shore	NP	0.03	3	0.06	1.00	1	-
Aug 16-Sept 30	Shore	NP	0.00	1	-	-	-	-
Oct 1-Nov 30	Shore	NP	0.33	4	0.65	0.50	2	0.98
April 1-May 15	Boat	SMB	0.23	1	0.04	0.00	1	-
May 16-June 30	Boat	SMB	0.24	6	0.17	0.00	5	-
July 1-Aug 15	Boat	SMB	0.51	8	0.32	0.17	7	0.08
Aug 16-Sept 30	Boat	SMB	0.30	6	0.23	0.35	6	0.40
Oct 1-Nov 30	Boat	SMB	0.21	5	0.11	0.00	5	-
April 1-May 15	Shore	SMB	0.00	1	-	0.00	4	-
May 16-June 30	Shore	SMB	0.59	4	0.46	0.00	1	-
July 1-Aug 15	Shore	SMB	0.94	2	0.47	0.27	2	0.03
Aug 16-Sept 30	Shore	SMB	0.47	2	0.93	0.00	1	-
Oct 1-Nov 30	Shore	SMB	-	-	-	-	-	-
April 1-May 15	Boat	LMB	-	0	-	-	-	-
May 16-June 30	Boat	LMB	0.08	2	0.10	-	-	-
July 1-Aug 15	Boat	LMB	-	0	-	-	-	-
Aug 16-Sept 30	Boat	LMB	0.05	2	0.00	-	-	-
Oct 1-Nov 30	Boat	LMB	0.42	2	0.70	-	-	-
April 1-May 15	Shore	LMB	-	0	-	-	-	-
May 16-June 30	Shore	LMB	0.25	1	-	-	-	-
July 1-Aug 15	Shore	LMB	0.00	1	-	-	-	-
Aug 16-Sept 30	Shore	LMB	-	0	-	-	-	-
Oct 1-Nov 30	Shore	LMB	-	0	-	-	-	-

Period	Angler Type	Species	Mean Targeted catch rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
April 1-May 15	Boat	WE	0.00	1	-	-	-	-
May 16-June 30	Boat	WE	0.39	2	0.77	1.00	1	-
July 1-Aug 15	Boat	WE	0.15	7	0.13	0.94	5	0.07
Aug 16-Sept 30	Boat	WE	0.13	4	0.20	0.75	2	0.49
Oct 1-Nov 30	Boat	WE	0.06	3	0.11	0.00	1	-
April 1-May 15	Shore	WE	-	-	-	-	-	-
May 16-June 30	Shore	WE	0.00	1	-	-	-	-
July 1-Aug 15	Shore	WE	0.00	1	-	-	-	-
Aug 16-Sept 30	Shore	WE	-	-	-	-	-	-
Oct 1-Nov 30	Shore	WE	-	-	-	-	-	-
April 1-May 15	Boat	YP	0.00	1	-	-	-	-
May 16-June 30	Boat	YP	0.62	2	0.92	0.09	2	0.19
July 1-Aug 15	Boat	YP	1.80	4	2.37	0.16	4	0.20
Aug 16-Sept 30	Boat	YP	0.60	3	0.36	0.34	3	0.64
Oct 1-Nov 30	Boat	YP	0.33	2	0.65	0.00	1	-
April 1-May 15	Shore	YP	0.18	3	0.21	0.50	2	
May 16-June 30	Shore	YP	1.15	7	0.85	0.54	4	
July 1-Aug 15	Shore	YP	0.10	2	0.20	1.00	1	-
Aug 16-Sept 30	Shore	YP	0.68	5	0.63	0.00	3	-
Oct 1-Nov 30	Shore	YP	2.38	3	4.21	0.00	2	-
April 1-May 15	Boat	Bass	0.00	1	-	-	-	-
May 16-June 30	Boat	Bass	0.05	3	0.10	-	-	-
July 1-Aug 15	Boat	Bass	0.00	1	-	-	-	-
Aug 16-Sept 30	Boat	Bass	0.25	3	0.28	-	-	-
Oct 1-Nov 30	Boat	Bass	-	-	-	-	-	-
April 1-May 15	Shore	Bass	-	0	-	-	-	-
May 16-June 30	Shore	Bass	0.30	2	0.59	-	-	-
July 1-Aug 15	Shore	Bass	0.92	1	-	-	-	-
Aug 16-Sept 30	Shore	Bass	0.00	2	-	-	-	-
Oct 1-Nov 30	Shore	Bass	-	0	-	-	-	-
April 1-May 15	Boat	Other	-	0	-	0.00	-	-
May 16-June 30	Boat	Other	0.00	1	-	0.00	1	-
July 1-Aug 15	Boat	Other	0.26	1	-	0.50	1	-
Aug 16-Sept 30	Boat	Other	-	0	-	0.00	-	-
Oct 1-Nov 30	Boat	Other	-	-	-	0.00	2	-
April 1-May 15	Shore	Other	-	0	-	0.00	-	-
May 16-June 30	Shore	Other	0.45	4	0.80	0.25	4	0.49

Period	Angler Type	Species	Mean Targeted catch rate (fish/hr)	n	95 % CI	Harvest Rate	n	95 % CI
July 1-Aug 15	Shore	Other	0.50	2	0.98	0.00	2	-
Aug 16-Sept 30	Shore	Other	-	0	-	0.00	0	-
Oct 1-Nov 30	Shore	Other	0.00	1	-	0.00	1	-

Appendix D- Regional comparative indices, discussion topics and creel survey data sheet.

TABLE D-1. Regional Smallmouth Bass catch (fish/hr) and harvest (% of fish kept) rates including waterbody, state, year, citation/agency and type of angler information used for catch/harvest rate.

Catch Rate (fish/hr)	Harvest Rate (%)	Waterbody	State	Year	Citation	Type
0.61	12	Noxon Reservoir	MT	2015	This report	Targeted
0.33	8	Cabinet Gorge Reservoir	MT	2015	This report	Targeted
0.01- 0.05	-	Fort Peck Reservoir	MT	1990, 2004, 2008, 2010, 2014	MFWP unpublished, H. Headley	Overall
0.02	15	Nelson Reservoir	MT	2014	C. Nagel 2015, MFWP	Overall
0.08	13	Middle Missouri River	MT	2007	Gardner and Wente 2008, MFWP	Overall
0.29	-	Upper Section, Middle Missouri River	MT	2007	Gardner and Wente 2008, MFWP	Overall
2.07	8	Hayden Lake	ID	2010	IDFG 2011	Targeted
1.45	6	Coeur d'Alene Lake	ID	2009	IDFG 2010	Targeted
0.53	-	Lateral Lakes	ID	2009	IDFG 2010	Targeted
0.19	15	Flaming Gorge Reservoir	WY/UT	2003	Mosley et al. 2003, UTDNR	Overall
0.11	-	Lake Roosevelt	WA	1998	Spotts et al. 2002	Overall

TABLE D-2. Regional Largemouth Bass catch (fish/hr) and harvest (% of fish kept) rates including waterbody, state, year, citation/agency and type of angler information used for catch/harvest rate.

Catch Rate (fish/hr)	Harvest Rate (%)	Waterbody	State	Year	Citation	Type
0.47	4	Noxon Reservoir	MT	2015	This report	Targeted
1.00	1	Hayden Lake	ID	2010	IDFG 2011	Targeted
0.40	14	Coeur d'Alene Lake	ID	2009	IDFG 2010	Targeted
1.50	13	Lateral Lakes	ID	2009	IDFG 2010	Targeted

TABLE D-3. Information on bass species harvest during closure from June 15-July 15 on both reservoirs including waterbody, date, species harvested, number harvested, angler county and state of origin.

Waterbody	Date	# of anglers in party	Spp. Harvested	# Harvested	Angler Origin-County	Angler Origin-State
Noxon	21-Jun	1	LMB/SMB	4, 12	Sanders	MT
Noxon	21-Jun	2	SMB	1	Sanders	MT
Noxon	11-Jul	2	SMB	5	Lincoln	MT
Noxon	11-Jul	2	SMB	5	Lincoln	MT
Cabinet	9-Jul	2	SMB	4	Sanders	MT
Total				**31**		

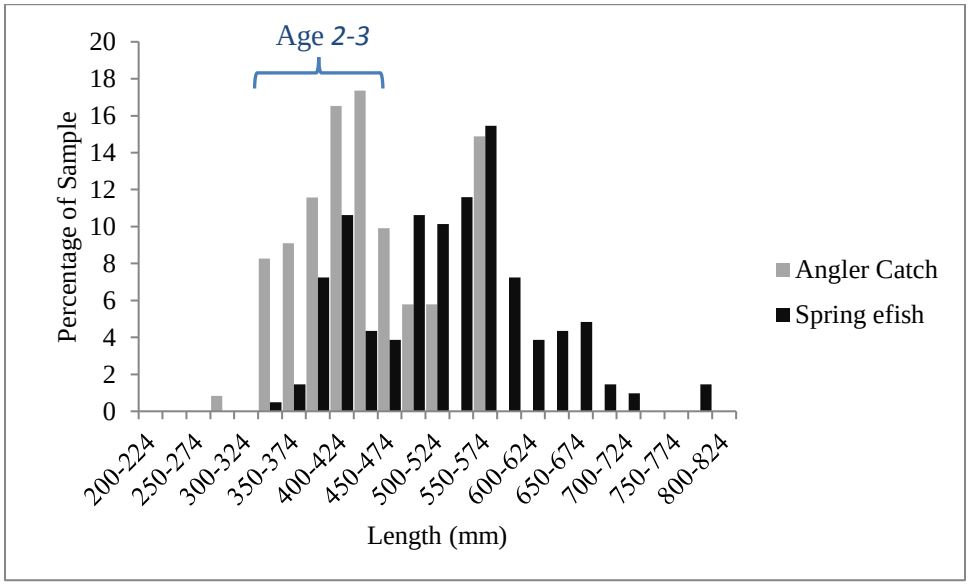

FIGURE D-1. Length frequency histogram for Walleye harvested by anglers in 2015 and fish collected for spring electrofishing efforts in spring of 2015.

TABLE D-4. Regional Walleye catch (fish/hr) and harvest (% of fish kept) rates including waterbody, state, year, citation/agency and type of angler information used for catch/harvest rate.

Catch Rate (fish/hr)	Harvest Rate (%)	Waterbody	State	Year	Citation	Notes
0.09	84	Noxon Reservoir	MT	2015	This report	Targeted
0.15	86	Cabinet Gorge Reservoir	MT	2015	This report	Targeted
0.27*	-	Canyon Ferry Reservoir	MT	2001-14	Bramblet and Zale 2016	Targeted
0.46*	-	Holter Reservoir	MT	2001-14	Bramblet and Zale 2016	Targeted
0.16-0.45	-	Fort Peck Reservoir	MT	1990, 2004, 2008, 2010, 2014	MFWP unpublished, H.Headley	Overall
0.60	32	Fresno Reservoir	MT	2014	MFWP unpublished, C. Nagel	Overall
0.46	44	Nelson Reservoir	MT	2014	MFWP unpublished, C. Nagel	Overall
0.24-0.72	33-54	Tibor Reservoir	MT	1991, 1993, 1994, 1995, 1996, 1997,1998,1999,2000	Hill 2000, MFWP	Overall
0.11-0.35	50-86	Lake Frances	MT	1989, 1993, 1994, 1995, 1996, 1997, 1998, 1999,2000	Hill 2000, MFWP	Overall
0.04-0.14	33-85	Hauser Reservoir	MT	1998, 1999, 2000	Dalbey and Humphrey 2002, MFWP	Overall
0.04-0.13	-	Holter Reservoir	MT	1998, 1999, 2000	Dalbey and Humphrey 2002, MFWP	Overall
0.04	25	Middle Missouri River	MT	2007	MFWP, Gardner and Wente 2008	overall
0.37	43	Lake Pend Oreille	ID	2014	Bouwens and Jakubowski 2016, IDFG	Targeted
0.10	-	Lake Roosevelt	WA	1998	Spotts et al. 2002	Overall

*mean catch rate from 2001 through 2014.

TABLE D-5 Regional Northern Pike catch (fish/hr) and harvest (% of fish kept) rates including waterbody, state, year, citation/agency and type of angler information used for catch/harvest rate.

Catch Rate (fish/hr)	Harvest Rate (%)	Waterbody	State	Year	Citation	Notes
0.17	36	Noxon Reservoir	MT	2015	This report	Targeted
0.24	41	Cabinet Gorge Reservoir	MT	2015	This report	Targeted
0.01-0.14	-	Fort Peck Reservoir	MT	1990, 2004, 2008, 2010, 2014	MFWP unpublished, H.Headley	Overall
0.11	21	Fresno Reservoir	MT	2015	Nagel 2016, MFWP	Overall
0.06	47	Nelson Reservoir	MT	2014	Nagel 2015, MFWP	Overall
0.14	23	Hayden Lake	ID	2010	IDFG 2011	Targeted
0.17	19	Coeur d'Alene Lake	ID	2009	IDFG 2010	Targeted
0.16	17	Lateral Lakes	ID	2009	IDFG 2010	Targeted
0.02-0.08	16-83	Tibor Reservoir	MT	1991, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000	Hill 2000, MFWP	Overall
0.11-0.64	27-64	Lake Frances	MT	1989, 1993, 1994, 1995, 1996, 1997, 1998, 1999 ,2000	Hill 2000, MFWP	Overall

TABLE D-6 Regional Yellow Perch catch (fish/hr) and harvest (% of fish kept) rates including waterbody, state, year, citation/agency and type of angler information used for catch/harvest rate.

Catch Rate (fish/hr)	Harvest Rate (%)	Waterbody	State	Year	Citation	Notes
1.39	33	Noxon Reservoir	MT	2015	This report	Targeted
0.91	18	Cabinet Gorge Reservoir	MT	2015	This report	Targeted
0.01	67	Fresno Reservoir	MT	2014	MFWP unpublished, C. Nagel	Overall
0.18	85	Nelson Reservoir	MT	2014	MFWP unpublished, C. Nagel	Overall
0.09	-	Coeur d'Alene Lake	ID	2009	IDFG 2010	Targeted
2.76	-	Lateral Lakes	ID	2009	IDFG 2010	Targeted
1.20*	-	Canyon Ferry Reservoir	MT	2000-2008	Bramblet and Zale 2016	Targeted
0.01-0.05	16-82	Tibor Reservoir	MT	1991, 1993, 1994, 1995, 1996, 1997,1998,1999,2000	Hill 2000, MFWP	Overall
0.13-0.41	28-83	Lake Frances	MT	1989, 1993, 1994, 1995, 1996, 1997, 1998, 1999,2000	Hill 2000, MFWP	Overall
0.01-0.12	-	Hauser Reservoir	MT	1998, 1999, 2000	Dalbey and Humphrey 2002, MFWP	Overall
0.08-0.23	-	Holter Reservoir	MT	1998, 1999, 2000	Dalbey and Humphrey 2002, MFWP	Overall

*mean catch rate from 2000 through 2008.

TABLE D-7. Example of creel interview data sheet used by clerks during the 2015 survey on Noxon Reservoir, Cabinet Gorge Reservoir and the Bull River (not to scale).

Interview #	Date	Time	Waterbody	Location	# of anglers	Shore or boat	Start time	Trip complete	# of lines	Targeted spp.	Spp. kept	Length	Spp. released	# of fish	Length range	Angler Origin: City/County	Angler Origin: State	Length of trip	Lodging