FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME
FISHERY MANAGEMENT ANNUAL REPORT

Virgil Moore, Director

SOUTHWEST REGION - MCCALL
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ABSTRACT

During 2014, IDFG staff surveyed 39 high mountain lakes in the McCall sub region. The lakes surveyed encompassed several different drainages throughout the McCall sub region including the Snake, Payette, and Salmon Rivers. Of the 39 lakes surveyed, no fish were collected in nine lakes, while 10 lakes did not support amphibian populations. Out of those lakes surveyed, 32 of the lakes have been stocked with some species of trout by the Department in past years.

The 2014 surveys aimed to assist Nampa Fisheries Research staff with a triploid Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi* evaluation. In 2014, 24 of the research study lakes were surveyed with an additional 15 other regional mountain lakes. Of the 24 research lakes, no fish were collected in six, while all others contained at least one fin-clipped study trout.

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INTRODUCTION

Mountain lake surveys are conducted annually to gather current survey data to describe current alpine lake fisheries (presence, species, size distribution) and to develop management strategies to meet fishery objectives. These surveys are an important tool for managers to understand the fish population status of these lakes, and amphibian presence, threatened and/or endangered species presence, human use and impact, water quality, and to evaluate the effectiveness or need of trout stocking. From July through September 2014, Idaho Department of Fish and Game (DFG) staff sampled 39 lakes in the McCall area of the Southwest Region. The lakes surveyed encompassed several different drainages throughout the McCall sub region including the Snake, Payette, and Salmon Rivers. The main focus of the 2014 high mountain lake surveys was to assist IDFG Nampa Research staff conduct a hatchery trout evaluation study on triploid Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi* stocked in recent years. These study fish were marked by a fin clip in order to distinguish them from other fish inhabiting the lakes. Additional lakes outside the research program were surveyed for general data collection for the McCall fisheries program.

METHODS

IDFG staff sampled a total of 39 high mountain lakes between July 15, and September 7, 2014. Some of these lakes have excellent trail access, and others require strenuous cross-country hiking. Lakes included in the triploid cutthroat trout study were sampled using floating gill nets. Lakes for regional data collection were sampled with one floating and one sinking gill net. All gill nets were experimental types consisting of nylon mesh panels of 19, 25, 30, 33, 38, and 48 mm bar mesh (46 m long and 1.5 m deep). Additional fish were collected using fly and spinning tackle to increase sample size of collected fish.

All fish collected were measured to the nearest mm total length (TL) and weighed to the nearest gram. Captured fish were examined for fin clips that distinguished identified them as part of the triploid Westslope Cutthroat Trout research project. Additional data describing the geomorphic, ecological, and human use impact for each lake was also collected. Amphibian presence was determined using the Visual Encounter Survey (VES) method. Human use data included the amount of trails around each lake, counts of fire rings, and campsite development. Water quality data collected included conductivity (µS/cm), and water temperature, obtained using an inflatable raft on the lake. The raft was also used to obtain a maximum depth reading of the lake by conducting a depth profile. All survey data was entered into the IDFG Lakes and Reservoirs Database.

RESULTS

During the 2014 field season, there were a total of 39 high mountain lakes surveyed in the McCall area. McCall sub region staff sampled a total of 28 lakes, while Nampa Research staff surveyed 11 lakes. Sampled lakes during the 2014 field season varied between being extremely isolated and being located near roads. A large number of these lakes supported an abundance of amphibians (Table 1), as well as some sort of fish population. No fish were collected in nine of the 39 lakes surveyed. No fish or amphibians were sampled in only one lake. The number of lakes found to contain fish by species collected is presented in Table 2.

Of the 39 lakes that were surveyed, 32 of the lakes had been stocked with some species of trout by the Department in past years. Fish were present in 30 of the lakes surveyed during

2014, some with multiple species. Table 3 gives an overall comparison of all of the lakes that were surveyed in 2014 with the species of fish and amphibian presence, current stocking status, and level of human use (High, Medium, Low, and Rare).

In the seven area survey lakes, we captured fish in both sinking and floating gill nets. Floating gill nets caught fewer fish than sinking nets in six of the seven lakes, with catch being equal in one lake.

Columbia Spotted Frogs *Rana luteiventris* were the most widespread amphibian sampled, being found in nearly half the lakes surveyed. Western Toad, *Bufo borea* was most commonly found in the juvenile life stage with few adults being observed. There were several lakes with multiple species of amphibians coexisting (Table 3).

MANAGEMENT RECOMMENDATIONS

1. Continue annual high mountain lake surveys to fill in the missing data gaps within the region.

2. Cooperate with Nampa Research staff when possible to define management options for mountain lakes.

3. Continue using sinking gill nets as the standard method to sample fish in high mountain lakes within the McCall sub region.

SOUTHWEST REGION – MCCALL 2014 ANNUAL FISHERY MANAGEMENT REPORT

LOWLAND LAKE SURVEYS

ABSTRACT

We completed the annual fall gillnetting in Lake Cascade to monitor fish communities. Yellow Perch *Perca flavescens* were the most abundant species netted and comprised 32% of total catch followed by Northern Pikeminnow *Ptychocheilus oregonensis* (24%). Rainbow Trout *Oncorhynchus mykiss gairdneri* made up 3% of the catch. Age-at-length of 200 mm, 250 mm, and 300 mm Yellow Perch were three, four to five and seven years, respectively. Yellow Perch greater than 250 and 300 mm made up 44% and 32% respectively of all perch sampled. Ten percent of all Yellow Perch sampled were greater than 350 mm. Smallmouth Bass *Micropterus dolomieu* incremental relative stock density for 300 – 400 mm and 400 – 500 mm fish were 43 and 29, respectively.

We conducted Lake Cascade holiday angler counts on Memorial Day, July 4th and Labor Day to continue our long term angling pressure trend. 2014 counts averaged 63 boats and 54 shore anglers, the highest since 1992 (52 boats and 116 shore anglers) when total angling pressure was 321,000 hours.

We compared survival of triploid and diploid fingerling Rainbow Trout stocked in Lake Cascade in 2014. Both stocks were differentially grit-marked and monitored through the year to determine relative survival. Survival of these fish was poor with only one 2014, Poison Creek released triploid, captured during summer and fall gillnetting efforts.

We completed an ice fishing creel survey on Lake Cascade in January and February 2015. The ice fishing season was unusually short in 2015 with approximately 45 days of safe ice compared to a “normal” year of 75 to 80 days. We estimated 11,135 angler hours were spent to harvest 2,843 Yellow Perch and 232 Rainbow Trout.

We continued studies in Payette Lake in 2014 to obtain a Lake Trout *Salvelinus namaycush* population estimate, collect age data, and remove as many Lake Trout less than 760 mm as possible. We gill netted 356 Lake Trout less than 760 mm, of which 340 were netting mortalities or culled. We collected 171 Lake Trout equal or greater than 760 mm, of which 34 were netting mortalities. We tagged 149 Lake Trout with T-bar anchor tags in 2014 and had nine recaptures. A simple Petersen mark recapture population estimate was 7,286 +/- 4,265 (95% CI). We aged 90 Lake Trout ranging from 2 to 34 years with a mean age of 13. The catch curve from 2013 and 2014 age data indicated low mortality rates for fish less than age 17. The removal of 374 Lake Trout had not had any significant effect on mean length or mean relative weight by the end of the collection season (October).

We completed fishery surveys on Oxbow Reservoir. We collected 521 fish consisting of 12 species. Smallmouth Bass were the most abundant species with 400 collected followed by 42 Channel catfish *Ictalurus punctatus.* Smallmouth Bass were also the most abundant in terms of weight collected. Smallmouth Bass incremental relative stock densities in Oxbow Reservoir were 18 and 5 for RSD-300 and 400 respectively. Electrofishing catch for Smallmouth Bass greater than 299 mm was 0.475 fish/minute.

We completed fishery surveys on Hells Canyon Reservoir. We collected 426 fish consisting of 13 species. Smallmouth Bass were the most abundant species collected followed

by Channel Catfish and Bridgelip Sucker *Catostomus columbianus.* Smallmouth Bass incremental relative stock densities for Hells Canyon Reservoir were 4 and 0 for RSD-300 and 400 respectively. Electrofishing catch for Smallmouth Bass greater than 299 mm was 0.15 fish/minute.

Horsethief Reservoir was found to have a large number of illegally stocked Black Bullhead *Ameiurus melas*. Length frequencies indicated the presence of at least five age classes.

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OBJECTIVES

To conduct investigations and implement management strategies on lowland lakes and reservoirs to protect, maintain, and enhance McCall area fish and fisheries.

LAKE CASCADE OCTOBER FISHERY SURVEY

Introduction

Since the Yellow Perch *Perca flavescens* restoration treatments were completed in 2004, 2005, and 2006 (Janssen et al. 2008), fish management activities on Lake Cascade have been directed at monitoring the results of those efforts and overall changes in the fish community. Specific objectives listed in the IDFG 2013-2018 Fisheries Management Plan (IDFG 2012) included monitoring abundance, size, and age trends of the Yellow Perch and Northern Pikeminnow *Ptychocheilus oregonensis* populations.

To protect the Yellow Perch fishery from excessive Northern Pikeminnow predation, the abundance and size distribution of Northern Pikeminnow must be monitored. A trend towards a majority of Northern Pikeminnow greater than 350 mm indicates the need for control measures to be implemented (Allen et al. 2009). We continued these monitoring efforts with an intensive gill net fishery survey in 2014.

Methods

The 15 gill net sites sampled in 2014 are described in (Janssen et al. 2014)., One sinking and one floating, IDFG standard experimental lake survey gill net was set at each site. At shoreline sites, sinking gill nets were attached to or near the shore. The floating net was set in a minimum of 3 m deep water as close to the shoreline set as possible. Mid-lake sets were simply set in near proximity to each other. Nets were fished overnight and pulled the next day. All fish were identified and measured for total length (nearest mm) and a subsample weighed.

Results

We sampled all 15 sites from October 2 through October 9, 2014. We collected 1,378 fish of 13 species (Table 4). Yellow Perch were the most abundant species netted and comprised 32% of total catch followed by Northern Pikeminnow (24%) and Largescale Sucker *Catostomus macrocheilus* (22%). Rainbow Trout *Oncorhynchus mykiss gairdneri* and Smallmouth Bass *Micropterus dolomieu* made up 3% and 5% of the total catch, respectively.

Length frequency data for all fish collected are presented in Table 5. There were four strong age classes of Yellow Perch collected. Ages four through seven were the most abundant with similar catch rates and ranged in size from 230 mm to 340 mm (Figure 1). Length frequency data revealed ages of 200 mm, 250 mm, and 300 mm fish to be three, four to five and seven years old, respectively. Yellow Perch greater than 250 and 300 mm made up 44% and 32%, respectively, of all perch sampled. Ten percent of all Yellow Perch sampled were greater than 350 mm. The IDFG standard lake survey gill nets were ineffective at capturing Yellow Perch less than 140 mm and Northern Pikeminnow less than 160 mm.

We collected 45 Rainbow Trout of which 6 were thought to be of natural origin. Natural origin trout ranged in size from 385 mm to 455 mm. Hatchery Rainbow Trout ranged in size from 320 mm to 519 mm. We collected 67 Smallmouth Bass with a proportional stock density of 76. Incremental Relative Stock Densities for 300 – 400 mm and 400 – 500 mm fish were 43 and 29 respectively (Table 6). The Northern Pikeminnow population structure was similar to that found in the previous two years with 36% greater than 350 mm (Table 7 and Figure 2). Mean catch per gill net site has not changed significantly from the 2012 and 2013 fall surveys (Table 7).

Discussion

The Northern Pikeminnow population appears stable. No significant changes in the mean catch per gill netting site were observed (Table 7). The total catch of 335 Northern Pikeminnow in 2014 was higher than the 2013 survey (213), but similar to the catch in 2012 (351).

Our monitoring strategy uses the percent of Northern Pikeminnow (NPM) greater than 350 mm to determine the need for population reduction to protect Yellow Perch (Allen et al. 2009). In 2014 surveys, the percent of NPM greater than 350 mm was 36%. This is only slightly higher compared to 33% and 32% observed in 2013 and 2012, respectively. Mean catch of Northern Pikeminnow greater than 350 mm per gillnetting site has not changed significantly since 2012 (90% CI) (Figure 3).

Mean catch of Yellow Perch per gillnetting site has not changed statistically since 2012. The Proportional Stock Densities (RSD-200) (130 mm/200 mm) of Yellow Perch have fluctuated from 66 in 2013 to 89 in 2014 (Table 8). Relative Stock Densities for 300 mm and 380 mm fish have fluctuated from 13 to 32 and 0.7 to 1.4 respectively over the last three years' surveys.

Management Recommendations

1. Continue annual fall gill netting fish survey to monitor Yellow Perch and Northern Pikeminnow populations. These data also provide valuable insight into the populations and fishery status of stocked salmonids and other game fish.

HOLIDAY ANGLER COUNTS

Introduction

Prior to 2010, the last comprehensive angler survey was completed on Lake Cascade in 1991 and 1992. Holiday angler counts began in 1996 as a relatively inexpensive way to track changes in angling pressure until the next comprehensive survey was completed. The angler counts coincidentally started just prior to the collapse of the Yellow Perch fishery. This has given managers a tool to monitor changes in angling pressure prior to, during the fishery collapse and after the Yellow Perch fishery restoration project from 2004 through 2006. We completed angler counts again in 2014.

Methods

We conducted holiday angler counts at 10 AM in 2014 on Memorial Day, July 4th and Labor Day. A boat was utilized to count all fishing boats and shore anglers. We calculated the yearly average angler count for boat and shore anglers across all three surveys.

Results

Angler counts were completed on Memorial Day, July 4th and Labor Day in 2014. The average angler count for boat and shore anglers were 63 and 54 , respectively (Table 9).The 2014 counts were the highest since 1992 (52 boats and 116 shore anglers) when total angling pressure was 321,000 hours. The highest 2014 boat count of 71 was made on Memorial Day and the highest shore angler count of 103 was made on Labor Day.

Discussion

Angling pressure has increased dramatically since the recovery of the Yellow Perch fishery. Angler boat counts were below 18 from 2000 through 2004 and below 38 from 2005 through 2010.

Management Recommendation

1. Continue holiday angler counts to monitor angler use and compare results with future creel survey studies.

LAKE CASCADE RAINBOW TROUT FINGERLING STOCKING EVALUATION

Introduction

Recent tagging studies (Casinelli 2014) indicated that catch and/or harvest rates of stocked, catchable-sized (203 – 280 mm TL) Rainbow Trout in Lake Cascade were less than one percent with some stocked groups having no tag returns. Approximately 100,000 to 150,000 catchable-size Rainbow Trout had been stocked in Lake Cascade annually in recent years. Due to rising productions costs of catchable-size Rainbow Trout and their historically poor returns in Lake Cascade, the stocking request for these fish was reduced from 150,000 to 75,000 annually beginning in 2012. In lieu of stocking catchable Rainbow Trout, fingerling Rainbow Trout were stocked in Lake Cascade.

Previous Rainbow Trout fingerling stocking evaluation data on Lake Cascade in 1990 and 1991 indicated survival rates less than 0.7% for all fingerling less than 250 mm at stocking (Janssen and Anderson 1994). The recent shift to fingerling trout stocking and prior data prompted McCall staff to reevaluate fingerling survival in 2012 (Janssen et al. 2014) to monitor the success of these stockings. Specifically, we monitored the fate of the stockings through the year with gill netting. We also compared survival between two stocking sites: Poison Creek and Blue Heron boat ramps. As an additional comparison, we also differentially marked a small group of triploid Hayspur strain Rainbow Trout fingerlings.

Results of a previous 2012 study suggested that fingerlings released at Poison Creek boat ramp survived at a higher rate than did the Blue Heron boat ramp releases. The study also suggested that the triploid Hayspur fingerling group survived at a higher rate than did the standard diploid fingerlings. We repeated this study in 2013, but did not include a triploid group of fish (Janssen et al. 2015). Results again indicated that fish released at Poison Creek boat ramp survived at a higher rate than did the Blue Heron released fish,

Because the 2012 study results suggested that triploid fingerling survived at a higher rate than diploids we stocked both triploid and diploid fingerlings in 2014. Both stocks were differentially grit marked and monitored through the year to determine relative survival.

Methods

We fluorescent grit marked Hayspur strain fingerling Rainbow Trout stocked in Lake Cascade in 2014. The fish were reared and marked at IDFG's Hagerman State Fish Hatchery. Trout were marked according to the grit marking techniques described in Janssen et al. (2013). We used two different colors (red and chartreuse) to differentiate between diploid and triploid stocks of trout. The fish were evenly distributed between the Poison Creek boat ramp and the Blue Heron boat ramp release sites.

The fluorescent grit mark is generally considered to be a permanent mark (Nielson, 1990). To determine marking success a sample of marked live fish of each color was held at the hatchery for one month, post marking, to allow time for grit not embedded in the fish to slough off. After the one month holding time approximately 100 fish from both color groups was examined under a black light in a completely dark room for the presence of the fluorescent mark.

Following stocking, experimental gill nets were used to sample marked fingerling trout in the lake. The gill nets were designed and built to maximize catch of Rainbow Trout from 150 mm to 350 mm. Each net was 0.91 m tall by 61 m long with four, 15.25 m long panels of different mesh sizes. The square mesh sizes of the four panels were 7.4 mm, 15.9 mm, 19 mm, and 25.4 mm.

We used a total of five gill nets across two sampling locations each night. We set a combination of one floating and one or two sinking nets at each sample site, with two sites sampled each night. The sinking nets were set to sample mid water depths by suspending them with either 0.91 m or 1.82 m long ropes below 3 floats tied equal distance along the float line in addition to the anchor/float end ropes. To avoid large catches of Yellow Perch, Black Bullheads *Ameiurus melas* and Largescale Sucker, all sample sites were located far enough offshore to ensure that the lead line of the deepest suspended sinking net was a minimum of 0.5 m above the lake bottom.

The lake was systematically sampled from north to south over a weeks' time, sporadically over the summer months. Two sites were sampled in each of the North, Sugarloaf Island, Crown/Vista points, and Cascade City/Cabarton general areas. Actual sites varied from month to month and were arbitrarily selected in an attempt to find Rainbow Trout. Marked fingerling data were also collected in October in conjunction with an intensive fishery survey (see "Lake Cascade Intensive Fishery Surveys" section of this report).

All Rainbow Trout collected were examined with a black light in complete darkness for presence of the fluorescent mark. Trout were sorted by mark and measured for total length (mm) and weighed to the nearest gram.

Results

We grit marked and stocked 166,000 triploid (green) and 244,000 diploid (red) Hayspur strain fingerling Rainbow Trout into Lake Cascade in 2014. Of those, 92,000 triploid and 137,000 diploid were released at the Poison Creek boat ramp and 74,000 triploid and 107,600 diploid were released at the Blue Heron boat ramp. Release site, dates, strain, size, and numbers of fish stocked at each site are presented in Table 10. Mark retention results indicated a marking rate of 94% for the triploid group and 89% for the diploid group. Therefore, the actual number of marked fish released was 156,040 triploid and 217,694 diploids when accounting for mark retention (Table 11).

We completed two gill net sampling efforts to collect marked fingerlings in June and July 2014. Crews sampled four nights in June and three nights in July. We collected one 2014, Poison Creek released triploid in June (TL = 62 mm). No marked fish were collected in the July sampling effort.

During the October 2014 fall fishery survey, we collected three 2012 marked diploid and two 2013 marked diploid Rainbow Trout (Figure 4). Two of the 2012 and both of the 2013 fish had been released at Poison Creek. Mean total length for the 2012 and 2013 marked trout were 482 mm and 335 mm, respectively. No marked trout from the 2014 stocking were collected during the October sampling.

Discussion

Gill net survey results suggest that fingerling survival has plummeted since 2012 to near zero. Results of a similar fingerling stocking study in Lake Cascade in 1990 and 1991 (Janssen and Anderson 1994) were similar and revealed that stocked 250 mm Rainbow Trout returned to the creel 9 times better than the best return of any Rainbow Trout less than 200 mm stocked.

The high survival rates of the fingerling stocked in 2012 was atypical when compared to the other four years of fingerling stocking evaluations since the early 1990's. Reasons for the high relative survival of the 2012 fingerlings are unknown but thought to be related to abundance and size of young-of-year Yellow Perch as a food source at time of stockings.

Management Recommendation

1. Discontinue fingerling Rainbow Trout stockings as survival is very low in most years. Replace with lower numbers of 12" catchable-sized Rainbow Trout.

PAYETTE LAKE LAKE TROUT POPULATION AND REMOVAL STUDIES

Introduction

Payette Lake fish management is focused on Kokanee, Lake Trout and Rainbow Trout (IDFG Fish Management Plan). The Rainbow Trout fishery is accomplished via the stocking of catchable size fish directly from the hatchery.

Lake Trout and Kokanee management is much more complicated and is a balancing act between fishing rules and stocking. The primary goal for these two species is to maintain both Kokanee and trophy Lake Trout fisheries. The methods to achieving this goal are confounding, since Kokanee are also the primary forage fish for Lake Trout in Payette Lake.

Lake Trout and Kokanee have co-existed in Payette Lake since the early 1940's. Trophy Lake Trout management started in 1996 with a one fish over 36 inches harvest rule. The harvest rule was changed in 2000 to catch and release only for Lake Trout.

Kokanee stocking in Payette Lake was suspended in 1994 as a result of IDFG research studies indicating that hatchery stocked Kokanee fry and fingerlings contributed little to this population (IDFG unpublished). Since that time, Kokanee spawner numbers have declined approximately 50% with each subsequent generation (Janssen et al. 2013). Kokanee spawner numbers have declined from a high of 65,000 in the mid 1990's to 526 in 2013 (See Payette Lake Kokanee, Lake and Streams sections, this report). Lake Trout condition has also declined as Kokanee numbers diminished. Due to these declines we reinstated annual Kokanee fingerling stockings in 2007. IDFG has stocked 87,000 to 460,000 Kokanee fry/fingerling annually since 2007.

Lake Trout *Salvelinus namaycush* condition (measured as length to weight and length to relative weight relationships) and Kokanee *Oncorhynchus nerka kennerlyi* numbers in Payette Lake have declined markedly since the mid 1990's. The 2013 Lake Trout length frequency data from historical sampling sites revealed no gross changes in population size or structure since 1988 (Janssen et al. 2015). However, data from the random/shoreline (r/s) gill netting sites revealed an entirely different scenario. At r/s sites, Lake Trout less than 600 mm made up 52.5% of the catch, compared to only 11% observed in the historical sites. This suggests there may be a much higher proportion of small/medium-sized Lake Trout present than was previously thought. Absent.

While annual Lake Trout recruitment in Payette Lake appears low, survival rates are excellent once a fish reaches 250 – 300 mm or age 5-6.. Lake Trout in Payette Lake are very slow growing and long lived compared to other lakes in the region. At both Lake Pend Oreille (Idaho) and Blue Mesa Reservoir (Colorado), Lake Trout rarely exceed 20 years of age, while those in Payette Lake were aged up to 34 years. Average age of a 700 mm fish in Payette Lake in 2013 was 13.5 years compared to 11 and 7 years old in Lake Pend Oreille and Blue Mesa Reservoirs, respectively.

Because only the historical sites had been sampled since 1988, we can only speculate that numbers of Lake Trout in other areas of the lake have increased since the mid 1990's. An increase in Lake Trout numbers with a corresponding increase in predation on Kokanee in recent years is most likely the main cause for the recent decline in Kokanee numbers and Lake Trout condition. Kokanee population studies in Payette Lake also suggest that their decline was related to predation (Janssen et al. 2015).

Catch curve data for Lake Trout collected in 2013 and 2014 indicated there had been little mortality over the last 16 years. This coincides with the trophy trout rules initiated 17-18 years prior (1996), which protected virtually all small Lake Trout. Harvest rules since 1996 have varied and have included: one fish over 914 mm, catch and release (2000), and presently a one fish harvest under 762 mm (2011). Nearly all Lake Trout less than 17 years old are also less than 762 mm, indicating these fish have realized virtually zero fishing mortality.

Additionally, Lake Trout were stocked at an all-time high from 1979 through 1985 with 27,000 to 85,000 fish annually. This historical stocking legacy is probably a major contributor to the excess numbers of small Lake Trout currently residing in the lake. These stocked fish would have begun spawning and producing progeny in the mid 1990's and would have lived well into the mid to late 2000's. Their progeny would have begun to spawn in the mid-2000,s which lines up with the current overabundance of age 6 to 14 year old fish.

Results of the 2013 Lake Trout studies indicated that mortality of Lake Trout less than 760 mm needed to be increased significantly to improve Lake Trout condition and recover the Kokanee population. We began work in 2014 to obtain a Lake Trout population estimate, collect more age data, and remove as many fish less than 760 mm as possible.

Methods

Lake Trout were sampled using five standard IDFG experimental, sinking gill nets each survey night. Nets were set mid-day, fished all night and pulled the following morning. All Lake Trout collected were measured (total length). Live fish greater than 762 mm were placed in the live well and all fish less than 762 mm were killed. Gill net catch statistics were calculated only for fish greater than 399 mm due to catch inefficiencies for fish less than 400 mm.

Lake Trout greater than 762 mm were measured for total length, weighed, and tagged with T-bar anchor tags. Fish were tagged in the operculum in 2013 and in May and June of 2014. This tagging location was chosen with the intent of reducing the incidence of large lesions on these long lived fish as observed in past tagging studies that used a spaghetti type tag.

Floy tags were placed as posteriorly on the operculum as needed to ensure that the tag anchor would not contact any gill filaments but maximize the distance to the edge of the operculum. Tag location was also dorsal enough that the tag anchor would rest on or over the small plateau created by the cleithrum (near intersection with lateral line). The tagging gun needle was inserted through the operculum at the prescribed location and the tag inserted. A small amount of super glue was then applied to both the inside and outside of the operculum around the tag anchor and stem to hold it in place until bone had regrown around the tag permanently anchoring it.

We observed some tag loss in May and June on a small number of fish presumably tagged in 2013. U-shaped erosion and scarring of the operculum at the tag site was observed. We began inserting tags in the "traditional" site at the base of the dorsal fin in July. Numbered aluminum jaw tags were also placed on all tagged fish and the left pelvic fin was cut off at its base to insure identification of recaptured fish.

We estimated Lake Trout age structure using otoliths and pectoral fin rays from fish killed by the nets or culled due to size. Otoliths were mounted in epoxy and pelvic fins were

coated with a layer of epoxy using a small stick. Both were then sectioned with a jewelers saw to a thickness of 0.60 mm. Otolith and fin sections were immersed in an oil immersion and examined with a microscope equipped with a camera that projected the magnified image onto on a computer monitor. This magnified image was used to age each structure. We aged a subsample of fish with both structures to compare results between the two structures. Based on those results, we then used fin rays to age the remaining samples.

Results

We collected 527 Lake Trout in 37 nights of gillnetting on Payette Lake from May 1 through October 3, 2014. By month, we sampled nine, six, thirteen, zero, eight and one nights from May through October respectively. Length frequencies for Lake Trout are presented in Figure 5.

We fished five nets per night for a total of 185 net nights and 8,460 m of net. Of the 527 Lake Trout collected, 356 (67.5%) were less than 760 mm. Lake Trout total length ranged from 155 to 1,060 mm with a mean of 620 mm (Table 18). Relative weight ranged widely, with a mean of 79.3 (Figure 6). The total length to weight relationship appeared to be the lowest since 1994/95 (Figure 7).

We collected 356 Lake Trout less than 760 mm of which 340 were netting mortalities or culled, 14 were tagged, and two released without tags. We collected 171 Lake Trout equal or greater than 760 mm of which 34 were netting mortalities. Of the remaining 137 fish greater than 759 mm, 52 were operculum tagged in May and June. From July 8th through October 3, 2014, 83 fish greater than 779 mm were dorsally anchor tagged, jaw tagged, and left pelvic fin clipped. Two fish were released untagged. We tagged a total of 149 Lake Trout in 2014.

We aged 90 Lake Trout ranging from 2 to 34 years with a mean age of 13 (Table 18). Total lengths at age and mean total length at age are presented in and Figure 9. The average age of a 760 mm fish was 16 years. Catch curve data indicated a mean mortality rate for fish less than age 17 of 0.10 (Figure 10).

We aged 36 Lake Trout using both otoliths and fin ray sections to compare results between structures. There were no significant differences in mean age between structures. Mean age was 13.4 for fin rays and 14.0 for otoliths. Differences in ages of fish over 15 were also insignificant with means of 21.0 and 20.5 for otoliths and fins rays respectively. However, the first three annuli were typically much easier to see in fin ray samples than in otoliths. Frequently the center three to five annulii in Payette Lake Lake Trout otoliths were found to be totally opaque and therefore the number of annuli in this opaque area were much harder to interpret. By examining both structures the reader learned to more accurately interpret the first two to three annuli in an otolith. This also revealed that fish aged in 2013 on average had two annuli added to the otolith age that were not in fact annulli.

We observed obvious T-bar anchor tag loss in five recaptured fish in May and June 2014 from fish presumed tagged in 2013. U-shaped scarring and small u-shaped bone erosion on the edges of the operculum at the tagging site were observed. We recaptured a total of nine Lake Trout in 2014 (including the five in May and June 2014) that most likely had been tagged in 2013 as all tags had been shed and identified as tagged from operculum scars. No 2014, dorsal anchor tagged, jaw tagged, and fin clipped fish were recaptured.

The recapture rate of marked Lake Trout was very low (nine) through the year. Even though operculum marked fish could be identified from scarring, the proportion of tagged fish did not increase throughout the year as the number of marked fish released increased. A simple Petersen population estimate using the 137 fish marked in 2013 and the 527 fish collected in 2014 with nine recaptures was 7,286 ± 4,265 (95% CI).

Discussion

The removal of 374 Lake Trout in 2014 did not appear to have any population effects. Comparison of length frequencies of Lake Trout collected in 2013 with fish collected in September and October 2014, after removal of the 374 Lake Trout, showed no change (Figure 11 and Figure 12).

In 2013, 55% of all Lake Trout collected were less than 760 mm, which increased to 66% in September/October 2014. However, there was no detectable change in mean total length for Lake Trout greater than 400 mm collected in 2013 (698 mm ± 19.6, 90% CI) (pre removal) and in September/October 2014 (675 mm ± 26.6, 90% CI) (Post removal of 374 fish).

Mean relative weight for fish greater than 400 mm also remained the same for fish collected in 2013 (79.9 ± 1.2, 90% CI) and those collected in September and October 2014 (79.26 ± 1.78, 90% CI). Unless we can develop a method or the financial means to remove a much larger portion of the Lake Trout population, current levels of effort are unlikely to significantly reduce the Lake Trout population. . The Kokanee population will continue to remain depressed until Lake Trout numbers are reduced significantly.

Mark recapture population estimates should be continued in 2015 to provide a higher confidence in the population estimate of Lake Trout. This would allow managers to determine magnitude of fish numbers that need to be removed to recover relative weights of Lake Trout and recover the kokanee population and resulting kokanee fishery. Lake Trout rules should be liberalized to encourage and enable the harvest of large numbers of Lake Trout.

Management Recommendations

1. Continue sampling the Payette Lake Lake Trout population and tagging all Lake Trout larger than 400 mm to improve population estimates.
2. Liberalize Lake Trout harvest rules to reduce the Lake Trout densities and improve kokanee abundance
3. Investigate options to increase Lake Trout removal effort or efficiency.

OXBOW AND HELLS CANYON RESERVOIRS FISHERY SURVEYS

Introduction

Oxbow and Hells Canyon reservoirs are impoundments located on the Snake River bordering Idaho and Oregon. Fish populations in both reservoirs were sampled to monitor changes in species composition and to determine the effectiveness of current fish management strategies.

Hells Canyon Reservoir has been managed under general fishing regulations which included a daily limit of any six bass while Oxbow Reservoir has been managed as a quality bass fishery since 1992. The quality bass rules for Oxbow Reservoir consisted of a no bass harvest before July 1st and a two bass limit with no harvest of fish between 12 and 16 inches (305 mm to 406 mm) in length beginning July 1. The Hells Canyon Reservoir bass regulation was not changed in 1992 as it was to be used as a control to compare Smallmouth Bass response to Oxbow Reservoir's quality bass regulation (Janssen et. al., 1997).

Methods

We sampled fish in Hells Canyon and Oxbow Reservoirs on June 18, 2014 using a combination of night time boat electrofishing and gill nets to complete a standard lowland lakes surveys (IDFG 2012). Trap nets were not used at either reservoir due to their inefficiencies in these two waters.

We set two floating and two sinking standard experimental gill nets in both Hells Canyon and Oxbow Reservoirs. We electrofished four randomly chosen, ten minute, shoreline transects in each reservoir. We collected length and weight data from all game fish species sampled up to five fish from each one-cm length interval. . These length/weight data were used to build length-weight regression curves for each species. Weight values for fish not weighed in the field were estimated based on length/weight equations and used to estimate total weight of all species collected.

We calculated incremental relative stock densities for Smallmouth Bass using 180 mm for stock length, 300 mm and larger for quality length and 400 and greater for preferred length fish.

Results

Oxbow Reservoir

We collected 521 fish consisting of 12 species from Oxbow Reservoir (Table 19). Smallmouth Bass were by far the most abundant species with 400 collected followed by Channel catfish *Ictalurus punctatus* (n = 42), and Northern Pikeminnow (n = 35).

Smallmouth Bass were also the most abundant in terms of weight, comprising 60% of the total biomass collected. Again, Channel Catfish were the second in total weight at 28.4%. Length frequencies, mean weights and mean relative weights (W_r) of all fish are presented in Table 21.

Smallmouth Bass incremental relative stock densities in Oxbow Reservoir for RSD-300 and 400 were 18 and 5 respectively (Table 23). Electrofishing catch-per-unit-effort for Smallmouth Bass greater than 299 mm was 0.475 fish/minute.

Hells Canyon Reservoir

We collected 426 fish consisting of 13 species of fish from Hells Canyon Reservoir (Table 20). Smallmouth Bass were the most abundant species collected (n = 267), followed by Channel Catfish (n = 54) and Bridgelip Sucker *Catostomus columbianus* (n = 24).

Common Carp *Cyprinus Carpio*, Smallmouth Bass and Channel Catfish and were the most abundant species in terms of weight (Table 20). Length frequencies, mean weights and mean Wr of all fish are presented in Table 22.

Smallmouth Bass incremental relative stock densities for Hells Canyon Reservoir were 4 and 0 for RSD-300 and 400 respectively (Table 23). Electrofishing catch-per-unit-effort for Smallmouth Bass greater than 299 mm was 0.15 fish/minute.

Discussion

A large shift in species composition was seen in both Oxbow (OX) and Hells Canyon (HC) Reservoirs since the last survey in 2008. White Crappie *Pomoxis annularis* were the most abundant species found in Oxbow and were the second most abundant fish in HC in 2008. This compares to zero and three White Crappie collected from OX and HC respectively in 2014.

The abundance of Crappie in both OX and HC is highly dependent on the abundance of crappie in Brownlee Reservoir. When crappie populations are high in Brownlee Reservoir large numbers of these fish are flushed through both OX and HC dams which produces a crappie fishery in these two reservoirs. Natural recruitment of crappie in both OX and HC appeared to have been very limited and has not maintained the fishery.

The Smallmouth Bass protected slot limit rule continued to work well in Oxbow Reservoir where incremental RSD-300 and 400 were 18 and 5 respectively in 2014 compared to 4 and 0 respectively in Hells Canyon Reservoir where there is no protected slot limit. RSD's have remained higher in Oxbow than in HC since at least 2003 (Table 24) (Janssen et al. 2006), (Janssen et al. 2009).

We are not convinced that the January 1 to June 30th harvest closure on Oxbow Reservoir is effective in providing more quality size bass and it makes the rules more confusing therefore we should consider removing it.

Management Recommendations

1. Continue the quality bass rule on Oxbow Reservoir, but consider removing the January 1 to June 30 harvest restriction.

2. Complete another standard lowland lake survey in 5 years (2019).

HORSETHIEF RESERVOIR

Introduction

Horsethief is an IDFG owned and operated reservoir managed as a put and take Rainbow Trout fishery. It is primarily stocked with catchable-sized Rainbow Trout, but also receives fingerling Rainbow Trout and Brown Trout *Salmo trutta* annually. The lake has been chemically renovated numerous times over the past 25 years to remove unwanted Yellow Perch originating from illegal stockings. The last treatment was made in 2006. In 2014, Black Bullheads *Ameiurus melas* were observed in the fishery by the local conservation officer. We sampled the lake to determine status of the bullhead population.

Methods

We sampled the reservoir on Octover 10, 2014 using two sinking IDFG experimental gill nets. One net was set on the North end of the Lake and the second net was set on the East shore opposite the dam. Nets were set in the afternoon, fished all night and pulled the next morning. All Black Bullheads were measured to total length.

Results

Gill net samples collected 90 Black Bullhead ranging in total length from 130 to 289 mm. Length frequencies revealed five age classes, indicating that Black Bullhead have been present in the reservoir since at least 2010. Horsethief Reservoir is managed to provide quality trout fishing. Black Bullhead typically negatively impact trout fishing through competition and predation. In addition, IDFG does not want to encourage any further illegal spread of this species in the area by maintaining a bullhead population in Horsethief Reservoir. Therefore, we recommend removing bullhead from Horsethief Reservoir.

Management Recommendation

1. Remove bullhead from Horsethief Reservoir by draining the reservoir in the fall of 2015 and treating any remaining water with rotenone.

2014 Southwest Region McCall – Fishery Management Report
RIVER AND STREAM SURVEYS

ABSTRACT

The 2013 Kokanee *Oncorhynchus nerka kennerlyi* spawning run estimate in the North Fork Payette River above Payette Lake was 423 fish, the lowest recorded escapement since 1988.

A creel survey was completed on the North Fork Payette River between McCall and Lake Cascade from October 5 to November 23, 2014. Total October angler effort was estimated at 90 hours (1.7 anglers/vehicle), all on weekend days. No anglers were observed in November. Only Mountain Whitefish were observed in the catch.

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OBJECTIVES

To conduct investigations and implement management strategies to protect, maintain, and enhance fish and fisheries in McCall Sub-Region's rivers and streams.

NORTH FORK PAYETTE RIVER KOKANEE SPAWNER COUNTS

Introduction

The spawning run of Kokanee into the NFPR from Payette Lake has been enumerated since 1988 to assess spawning escapement and to serve as a method of validating Kokanee population/density estimates and survival estimates from in-lake population work. This estimate was completed again in 2013.

Methods

We completed Kokanee spawner counts by walking the entire stretch of river utilized by spawning Kokanee and counting all live spawners. Counts were made twice weekly until a peak count was established. The total run estimate was made by multiplying the largest daily count by 1.73 (Frost and Bennett 1994).

Results

We completed three Kokanee spawner counts on the NFPR. Kokanee spawners arrived at the stream earlier this year with the peak count made one week earlier than the previous year. The highest live Kokanee count was 245 fish on September 3, 2014. The total spawning run estimate was 424 (245*1.73) fish (Table 25). No dead fish were found to collect length and weight data.

Discussion

Kokanee numbers are perilously low and continued efforts are needed to reduce Lake Trout predation on Payette Lake Kokanee. Kokanee fingerling stockings should continue to maintain some sort of spawning run. The Kokanee spawning run size is an important tool in monitoring effects of Lake Trout removal efforts if no hydroacoustic sampling is available to managers. Increases in run size would indicate improved Kokanee survival from reduced predation rates.

NORTH FORK PAYETTE RIVER CREEL SURVEY

Introduction

The North Fork Payette River (NFPR) between Smylie Lane Bridge and Payette Lake is 29.5 km (18.4 mi) long. This stretch of river is mostly private property, changing from urban home lots near McCall to larger ranch properties downstream. Small portions of public land lie near the southern and northern boundary of the study area. Bridges and dead-end roads provide some direct access for fishing, while the majority of the area must be accessed through private property or by floating. All but 4 km (2.5 mi) of the river are surrounded by private property. There are six primary access sites of which one crosses private property.

Prior to 1980 this section of the NFPR had a general stream fishing season and harvest limit. In 1980, fishing regulations changed to prohibit trout harvest between November 30 and Memorial Day, which remained in place through 2010. In 2010 most Idaho rivers and streams, including the NFPR, were opened to a year-round, six trout harvest season in an effort to simplify fishing rules.

During the winter and spring each year, 400 mm to 610 mm, sexually mature Rainbow Trout *Oncorhynchus mykiss* migrate upstream into the NFPR from Lake Cascade to spawn. Many of these trout appear to be of natural origin, with all of their fins intact. Some anglers speculate that these fish are remnants of endemic wild steelhead that inhabited the area prior to the 1930's when the 1st downstream dams were built, blocking natural steelhead and salmon runs from the ocean. This is unlikely given the numerous rotenone treatments that have occurred on the NFPR (between Payette Lake and Lake Cascade) to remove spawning Northern Pikeminnow and Largescale Sucker since the 1950's and the stocking of millions of hatchery Rainbow Trout in Lake Cascade, Payette Lake and the NFPR between the two waters over the past 60 plus years.

Little angling pressure had been observed on this section of river since the 2010 rule change took effect. However, a small group of local anglers expressed concerns that the recent change in fishing rules on this stretch of river could have a negative impact on the numbers and consequently, the catch rates of these larger Rainbow Trout. This group of anglers asked that we close this stretch of river to harvest from November 31 to Memorial Day weekend. To understand the impacts of the open harvest season during winter and early spring in this section of river, IDFG staff completed an angler use and harvest survey in 2012 and again in the fall of 2014.

Methods

A 'bus route' creel survey design described by Pollock et al. (1994) was chosen to assess angling pressure and harvest for the NFPR fishery. With the exception of access sites and wait times, specifics of this method for this survey were identical to and are described in the Lake Cascade Ice Fishing Survey Section of this report.

We identified eight access sites on the NFPR utilized by anglers (Table 26). Access sites, GPS locations, and creel technician wait times for each site are presented in Table 27. Daily sunrise to sunset times were split in two for AM and PM survey time periods.

Monthly catch and harvest rates were calculated by multiplying monthly angler hours by total monthly catch or harvest (ratio of means) from completed trip interviews. Monthly catch and harvest was calculated by multiplying total monthly hours by monthly catch rates

Results

The creel survey on the North Fork Payette River was conducted between October 5 and November 23, 2014. Each creel shift was a total length of 5 hours in October and 4 Hours in November. There were a total of 6 days surveyed during the month of October and 8 days during November. During October there were 5 days surveyed during the weekends/holidays and only one day surveyed during the week. November consisted of 4 days sampled during weekends/holidays while 4 days were surveyed during the week. Some creel days were sacrificed due to other ongoing projects.

Total angler vehicle effort in October was estimated to be 54 hours and total angler effort was estimated at 90 hours (1.7 anglers/vehicle), all on weekend days. Three groups of anglers were encountered for interviews and three Mountain Whitefish were caught, of which one was harvested. No angler vehicles were observed in November.

Discussion

The 2013 IDFG statewide Fisheries Management Plan lists the NFPR as general rule water, managed with stocked catchable-size Rainbow Trout. Considering the low effort and trout harvest observed special fishing rules are not warranted at this time. Angling pressure is very low and much of the river is currently protected from the general angling public as public access is very limited on the lower 2/3 of the river except to river floaters. No access was observed on private land however we know that there is some undocumented angling pressure but is thought to be very limited.

It is unlikely that these fish are remnant steelhead. The stretch of river between McCall and Smylie Lane Bridge has been chemically treated numerous times over the last 60 years to remove adult spawning Northern Pikeminnow. These “steelhead” are most likely progeny of steelhead catchables and fingerlings stocked in Lake Cascade over the last ten years as part of the efforts to improve trout fishing within the reservoir. Adfluvial adult Rainbow Trout in this river section are likely the result of hatchery trout which migrated up the NFPR and spawned successfully. The progeny of which are these large, naturalized “wild” rainbow trout. The recent surge in large, naturally produced, Rainbow Trout is likely the direct result of the recent chemical treatments in the NFPR in 2004, 2005 and 2006 (Janssen et al. 2008) to remove spawning adult Northern Pikeminnow. The treatments resulted in the reduction in predation on juvenile Rainbow Trout the following years both in the NFPR and in Lake Cascade where these large trout live and grow.

Management Recommendations

1. No change to the current fishing rules on the NFPR are warranted at this time based on angler use and harvest estimates. However we should get public input on 2016 fishing rule changes at IDFG public fishing rule scoping meetings scheduled for the 2014/15 winter.

TABLES

Table 1. Number of Lakes with amphibians and snakes observed by species in 2014.

	Columbia Spotted Frog	Long-Toed Salamanders	Western Toad	Garter Snake	None Observed
Number of Lakes Species Present	17	6	8	3	10

Table 2. Number of lakes with fish by species collected with gillnets in 2014.

	Rainbow Trout	Westslope Cutthroat Trout	RBT x WCT Hybrid	Brook Trout	Arctic Grayling	Tiger Muskie	Fishless
Number of Lakes Species Present	9	18	1	12	2	1	9

Table 3. Mountain lakes survey data including survey date, fish species collected, fish stocking status, amphibian presence and human use rating collected in 2014.

Lake	LLID	Catalog number	Survey date	Fish species collected	Fish currently stocked?	Amphibians present?	Human use rating
Twin Lake #2*	1165205451544	07-148	15 July 2014	Brook Trout	YES	NO	L
Tule Lake*	1156839446296	07-519	28 July 2014	Cutthroat Trout	YES	YES	M
Kimberly Lake #1	1158646454032	07-243	30 July 2014	Cutthroat Trout	YES	NO	M
Kimberly Lake #2*	1158672454036	07-244	30 July 2014	Cutthroat Trout	YES	YES	M
Bear Lake*	1158443454360	07-245	31 July 2014	Cutthroat Trout	YES	YES	M
Six Basin Lake #1*	1166011451964	05-135	1 August 2014	Brook Trout	YES	YES	L
Hidden Lake*	1161520451487	07-179	4 August 2014	Cutthroat Trout	YES	YES	M
Corral Lake	1161838451208	07-177	6 August 2014	Tiger Muskie	YES	YES	L
Grassy Mtn. Lake #1	1161935451667	07-180	6 August 2014	Rainbow Trout	YES	YES	M
Grassy Mtn. Lake #2	1161992451673	07-183	6 August 2014	Brook Trout	YES	YES	M
Mirror Lake*	1165255453372	07-114	6 August 2014	Cutthroat Trout	YES	YES	L
Upper Hazard Lake	1161350451742	07-170	7 August 2014	Brook Trout	YES	YES	H
Hard Creek Lake	1161449451724	07-173	7 August 2014	Brook Trout	NO	NO	L
Neal Lake	1161503450880	07-190	8 August 2014	Fishless	NO	YES	L
Six Basin Lake #2*	1165940451977	05-136	11 August 2014	Cutthroat Trout	YES	YES	L
Six Basin Lake #3*	1166026451932	05-137	11 August 2014	Fishless	YES	YES	R
Six Basin Lake #4*	1165991451947	05-138	11 August 2014	Fishless	YES	NO	R
Black Lake*	1148267453302	07-560	11 August 2014	Fishless	YES	YES	H
Satan Lake*	1165541452013	07-140	12 August 2014	Cutthroat Trout	YES	YES	M
Emerald Lake*	1165703452123	05-132	12 August 2014	Brook Trout	YES	NO	R
Big Horse Pasture Lake*	1165712451785	05-141	12 August 2014	Fishless	YES	YES	L
Upper Emerald Lake*	1165790451992	05-133	13 August 2014	Fishless	YES	YES	R
North Twenty Mile Lake*	1159265451254	09-395	13 August 2014	Cutthroat Trout	YES	YES	M
Long Twenty Mile Lake	1159327451202	09-397	14 August 2014	Rainbow Trout	YES	NO	L
South Twenty Mile Lake	1159262451208	09-398	14 August 2014	Rainbow Trout	YES	YES	L
East Twenty Mile Lake*	1159188451233	09-396	15 August 2014	Cutthroat Trout	YES	YES	L
Nethker Lake #1	1159473452425	07-414	26 August 2014	Grayling	YES	NO	R
Nethker Lake #2	1159797452444	07-415	26 August 2014	Fishless	NO	YES	R
Pete Creek Lake #2*	1159817452886	07-418	27 August 2014	Fishless	YES	YES	L
Pete Creek Lake #1	1159697452660	07-417	28 August 2014	Brook Trout	NO	YES	R
Pete Creek Lake #4	1159668452717	07-417.5	28 August 2014	Brook Trout	NO	YES	R
Pete Creek Lake #3*	1159741452640	07-416	29 August 2014	Cutthroat Trout	YES	YES	R
Bear Pete Lake	1159559453075	07-419	30 August 2014	Brook Trout	NO	NO	R
Creek Lake*	1159731453280	07-422	31 August 2014	Cutthroat Trout	YES	YES	R
Cooks Lake*	1157451453422	07-278	4 September 2014	Cutthroat Trout	YES	YES	L
California Lake	1158296453301	07-249	5 September 2014	Rainbow Trout	YES	YES	H
Middle California Lake*	1158437453323	07-250	5 September 2014	Fishless	YES	YES	R
Upper California Lake*	1158485453384	07-253	6 September 2014	Brook Trout	YES	NO	L
Union Lake*	1158086453564	07-278	7 September 2014	Cutthroat Trout	YES	NO	R

Table 4. Total catch of fish collected with gill nets in Lake Cascade in October 2014.

Species	Total	% of catch
Yellow Perch	441	32.0
Northern Pikeminnow	335	24.3
Largescale Sucker	303	22.0
Black Bullhead	134	9.7
Smallmouth Bass	67	4.9
Rainbow Trout (Hatchery)	39	2.8
Mountain Whitefish Prosopium williamsoni	28	2.0
Pumpkinseed Lepomis gibbosus	10	0.7
Black Crappie	8	0.6
Rainbow Trout	6	0.4
Largemouth Bass Micropterus salmoides	5	0.4
Kokanee (Late)	2	0.1
Grand Total	1378	100

Table 5. Length frequencies by species of fish collected with gill nets in Lake Cascade in October 2014.

Total Length Group (mm)	Yellow Perch	Northern Pikeminnow	Largescale Sucker	Rainbow Trout (all)	Smallmouth Bass	Mountain Whitefish	Black Bullhead	Black Crappie	Largemouth Bass	Pumpkin seed	Mountain White fish	Kokanee
90-99										1		
120-129										2		
130-139					1		1			3		
140-149	4				2				2			
150-159	8								1	3		
160-169	11						1			1		
170-179	6	5	1		1		2					
180-189	8	8					3					
190-199	12	8					6					
200-209	21	10					12					
210-219	12	7					5					
220-229	11	8					10					
230-239	33	7					7	2				
240-249	30	10	1				6					
250-259	36	14			1	1	7	2				
260-269	15	15	1		2	1	8	4				1
270-279	32	17			3	1	10					
280-289	30	13			2	3	7					1
290-299	29	16			7	6	11				1	
300-309	32	16	3		3	2	8					
310-319	24	16	2		1	4	11					
320-329	15	11	1	1	2	1	2				1	
330-339	13	14	1	1	3	3	4					
340-349	16	18		3	3		4					
350-359	15	12	4	2	5		4					
360-369	13	6	5	2	4	3	3					
370-379	9	11	3	3	4	1	1					
380-389	5	13	6		3		1					
390-399	1	13	6	1	2				1			
400-409		12	7	1	2							
410-419		8	6	3	2							

Table 5. Cont.

Total Length Group (mm)	Yellow Perch	Northern Pikeminnow	Largescale Sucker	Rainbow Trout (all)	Smallmouth Bass	Mountain Whitefish	Black Bullhead	Black Crappie	Largemouth Bass	Pumpkin seed	Mountain White fish	Kokanee
420-429		16	4	2	3							
430-439		7	9	1	2							
440-449		2	6		2							
450-459		6	10	2	1				1			
460-469		2	17	2	3							
470-479		3	12	3	3							
480-489		2	20	1								
490-499		4	19	4								
500-509		2	21	2								
510-519			21	5								
520-529			15	3								
530-539			17									
540-549			16	1								
550-559			14	1								
560-569			13									
570-579			6									
580-589			6									
590-599		1	6									
600-609		1	6									
610-619			5									
620-629			4									
630-639			3									
640-649			4									
650-659		1	2									
Grand Total	441	335	303	45	67	26	134	8	5	10	2	2

Table 6. Proportional Stock Densities (PSD) and incremental Relative Stock Densities (RSD) of Smallmouth Bass collected with gill nets in Lake Cascade in October 2014.

Size group	Value
PSD	76
RSD-300	76
RSD-300-400	48
RSD-400	29

Stock = 180mm, Quality = 300 mm, Preferred = 400 mm

Table 7. Total and mean catch per gillnetting site with 90% confidence intervals of Yellow Perch, Northern Pikeminnow, and Northern Pikeminnow greater than 350 mm collected in Lake Cascade in October 2012, 2013, and 2014.

	Yellow perch			Northern pikeminnow				Northern pikeminnow > 350 mm		
Year	Total catch	Mean catch	90% CI	Total catch	Mean catch	90% CI	Percent greater than 350 mm	Total catch	Mean catch	90% CI
2012	608	40	11	351	23	9.7	31	110	7.3	3.4
2013	739	49	85	213	14	7.4	33	70	4.7	1.9
2014	441	29	10	335	22	9.5	36	122	8.1	3.6

Table 8. Incremental Relative Stock Densities (RSD) for 200, 250, 300, and 380 mm Yellow Perch collected with gill nets in Lake Cascade in October 2012, 2013, and 2014.

Year	RSD-200 (PSD)	RSD-250	RSD-300	RSD-380
2012	69	45	27	1.2
2013	66	27	13	0.7
2014	89	65	32	1.4

**Stock Length = 130 mm, Quality Length = 200 mm, Preferred = 250 mm, Memorable = 300, Trophy = 380 mm.

Table 9. Mean boat and shore angler counts on Lake Cascade on three major holidays; Memorial Day, July 4th, and Labor Day, in 1982, 1991, 1992, 1996 through 2010, and 2014 with corresponding intensive creel survey angler hour estimates for 1982, 1991, 1992 and 2009.

	Holiday counts		Estimated angler hours (hours * 1000)		
Year	Avg. boats	Avg. # shore anglers	Boat anglers	Shore anglers	Total pressure[1]
1982	154	85	255.6	129.8	385.4
1986	na	na	212.8	128.2	340.9
1991	41.5	32	135.2	102	237.2
1992	52.5	116	144.2	177.3	321.5
1996	35	27	--	--	--
1997	36.5	19	--	--	--
1998	58	39.5	--	--	--
1999	27	31	--	--	--
2000	15	12	--	--	--
2001	11	12	--	--	--
2002	16.5	12	--	--	--
2003	17	6	--	--	--
2004	23	8.5	--	--	--
2005	28	12.5	--	--	--
2006	25	23	_	_	_
2007	24	28	_	_	_
2008	34	37	_	_	_
2009[2]	29	29	29.2[2]	23.1[2]	52.3[2]
2010	22.5	22	--	--	--
2014	63	54	--	--	--

[1] Does not include ice fishing hours.
[2] Creel survey from May 15, 2009 thru May 30, 2010

Table 10. Number and size of Hayspur strain Rainbow Trout fingerling stocked by mark, release site, date and mean length in Lake Cascade in 2014.

Mark color	Fish strain	Release site	Date of first stocking	Number stocked	Mean length at stocking (mm)
Red	Diploid	Poison Cr. Boat Ramp (North lake)	5/20/14	137,000	122
Green	Triploid		5/15/14	92,000	134
Red	Diploid	Blue Heron Boat Ramp (South lake)	6/17/13	107,600	115
Green	Triploid		7/8/13	163,240	133

Table 11. Percent retention of grit mark after 30 days by color group and total number of each color group of Rainbow Trout stocked in Lake Cascade in June and July 2013.

Marked group	% Marked	Number stocked	Corrected number of marked fish stocked
Hayspur Triploid (green)	94	166,000	156,040
Hayspur Diploid (red)	89	244,600	217,694

Table 12. Day length, shift length, and total wait times (minutes) for ice fishing creel survey on Lake Cascade in 2015.

	January (minutes)	February (minutes)
Avg. Day Length	560	625
Shift Length	280	312
North Wait Time*	216	248
South Wait Time*	240	272

*Wait time = Shift length - Travel Time

Table 13. Bus route creel survey access sites and wait times by month on Lake Cascade in 2015.

Lake section	Site #	January wait times	February wait times
North	Boulder Creek Boat Ramp	72	83
North	Poison Creek Boat Ramp	72	83
North	Medicare Point (WGS84=44.639988:116.117687)	72	83
South	Sugarloaf Boat Ramp/Old Hwy Area	103	116
South	Cascade City Boat Ramp Area	103	116
South	Blue Heron Boat Ramp	34	40

Table 14. Catch and harvest rates from creel survey data on Lake Cascade from January 10th through the 31st, 2015.

Section	Species	Catch rate	Harvest rate
North	Yellow Perch	1.37	0.22
	Rainbow Trout	0.0	0.0
South	Yellow Perch	0.41	0.25
	Rainbow Trout	0.04	0.04

Table 15. Catch and harvest rates from ice fishing creel survey data on Lake Cascade from February 1st through 16th, 2015.

Section	Species	Catch rate	Harvest rate
North	Yellow Perch	1.07	0.53
	Rainbow Trout	0.0	0.0
South			
	Yellow Perch	0.17	0.0
	Rainbow Trout	0.0	0.0

Table 16. Estimated ice angler effort and catch by time period and species on North section of Lake Cascade in January and February 2015.

North section						
			Yellow Perch		Rainbow Trout	
Time period	Day type	Angler effort	Estimated catch	Estimated harvest	Estimated catch	Estimated harvest
1/10-16/15	**Weekdays**	**607.50**	**832.28**	**133.65**	**0.00**	**0.00**
	Weekends	501.12	686.53	110.25	0.00	0.00
1/17-23/15	**Weekdays**	**295.20**	**404.42**	**64.94**	**0.00**	**0.00**
	Weekends	737.37	1010.20	162.22	0.00	0.00
1/24-30/15	**Weekdays**	**681.30**	**933.38**	**149.89**	**0.00**	**0.00**
	Weekends	808.20	1107.23	177.80	0.00	0.00
1/31-2/6/15	**Weekdays**	**30.60**	**32.74**	**16.22**	**1.22**	**0.00**
	Weekends	333.72	357.08	**176.87**	13.35	0.00
2/7-13/15	**Weekdays**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Weekends	153.00	163.71	**81.09**	6.12	0.00
2/14-16/15	**Weekdays**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Weekends	84.24	90.14	**44.65**	3.37	0.00
Totals	**Weekdays**	**1614.60**	**2202.82**	**364.70**	**1.22**	**0.00**
	Weekends	2617.65	3414.89	752.88	22.84	0.00
	Total	**4232.25**	**5617.71**	**1117.58**	**24.06**	**0.00**

Table 17. Estimated ice angler effort and catch by time period and species on South section of Lake Cascade in January and February 2015.

South section						
			Yellow Perch		Rainbow Trout	
Time period	Day type	Angler effort	Estimated catch	Estimated harvest	Estimated catch	Estimated harvest
1/10-16/15	**Weekdays**	**548.90**	**225.05**	**137.23**	**21.96**	**21.96**
	Weekends	197.12	80.82	**49.28**	7.88	7.88
1/17-23/15	**Weekdays**	**661.76**	**271.32**	**165.44**	**26.47**	**26.47**
	Weekends	95.70	39.24	**23.93**	3.83	3.83
1/24-30/15	**Weekdays**	**150.70**	**61.79**	**37.68**	**6.03**	**6.03**
	Weekends	2191.20	898.39	**547.80**	87.65	87.65
1/31-2/6/15	**Weekdays**	**1096.70**	**186.44**	**274.18**	**0.00**	**0.00**
	Weekends	1961.52	804.22	490.38	78.46	78.46
2/7-8/15	Weekends	0.00	0.00	0.00	0.00	0.00
Totals	**Weekdays**	**2458.06**	**744.60**	**614.52**	**54.45**	**54.45**
	Weekends	4445.54	1822.67	1111.39	177.82	177.82
	Total	**6903.60**	**2567.27**	**1725.90**	**232.28**	**232.28**

Table 18. Length frequency distribution, mean age, and mean relative weight (Wr) by length group of Lake Trout collected with gill nets from Payette Lake from May 1 through October 3, 2014.

Length group	Number fish	Mean age	Mean W_r
150-159	1	-	
200-209	1	-	
210-219	2	-	85.5
220-229	1	4	86.2
230-239	2	-	95.2
240-249	1	-	80.0
250-259	1	-	82.7
260-269	5	4.5	79.5
270-279	5	4	86.6
280-289	7	5	85.1
290-299	3	4	98.7
300-309	3	3.5	103.8
310-319	6	4.5	91.6
320-329	5	5	76.5
330-339	2	-	76.8
340-349	4	-	83.7
350-359	6	5	91.1
360-369	6	4	86.1
370-379	7	4	79.7
380-389	8	6	88.6
390-399	3	9	87.5
400-409	7	7	80.3
410-419	8	5	82.7
420-429	8	7.5	73.9
430-439	12	5	78.5
440-449	12	7	80.3
450-459	13	-	76.8
460-469	10	9	75.6
470-479	13	8	82.1
480-489	9	9	74.5
490-499	13	6	72.5
500-509	6	9	74.9
510-519	9	9	79.1
520-529	10	8.5	73.7
530-539	8	8	75.5
540-549	6	-	75.2
550-559	5	-	82.0
560-569	11	10.	75.4
570-579	6	10.5	79.5
580-589	10	9.5	77.3
590-599	8	11	80.3
600-609	9	11.5	80.8
610-619	5	11	79.4
620-629	4	-	74.3
630-639	9	10	77.2
640-649	6	13	85.9
650-659	5	14	85.3
660-669	4	12	87.0
670-679	1	10	87.7

Table 18. Cont.

Length group	Number fish	Mean age	Mean W_r
680-689	5	-	59.9
690-699	5	12	84.2
700-709	7	17	72.5
710-719	5	19.5	80.7
720-729	3	-	91.1
730-739	9	17	81.2
740-749	5	-	80.9
750-759	11	18	69.9
760-769	10	16	87.7
770-779	7	-	80.8
780-789	6	17.5	71.1
790-799	10	20	71.1
800-809	9	24	78.1
810-819	13	-	76.3
820-829	10	-	66.9
830-839	8	-	76.7
840-849	4	-	68.1
850-859	8	-	80.3
860-869	7	18	79.1
870-879	10	-	79.2
880-889	7	-	76.4
890-899	7	-	84.4
900-909	6	-	79.2
910-919	8	22	73.2
920-929	10	22	85.9
930-939	5	-	77.1
940-949	7	18	95.3
950-959	5	-	82.2
960-969	3	21	74.9
970-979	1	-	71.4
980-989	3	-	64.3
990-999	1	-	83.4
>1000	6	-	95.0
Grand Total	527		79.3

Table 19. Total number, weight, and average relative weight (W_r) of fish caught by species with electrofishing and gillnetting in Oxbow Reservoir in June17, 2014.

Species	Total number	Percent of number	Total wgt (kg)	Percent of total weight	Average Wr
Smallmouth Bass	400.0	76.8	59.6	47.1	100.7
Channel Catfish	42.0	8.1	28.4	22.4	92.3
Northern Pikeminnow	35.0	6.7	14.6	11.5	
Black Crappie	14.0	2.7	1.2	0.9	126.6
Largescale Sucker	12.0	2.3	19.2	15.2	
Rainbow Trout	6.0	1.2	1.4	1.1	84.0
Bluegill *Lepomis macrochirus*	5.0	1.0	0.5	0.4	104.8
Bridgelip Sucker	2.0	0.4	0.2	0.2	
Chiselmouth *Acrocheilus alutaceus*	2.0	0.4	0.5	0.4	
Common Carp	1.0	0.2	0.6	0.5	
Sculpin spp.	1.0	0.2	0.0	0.0	
Mountain Whitefish	1.0	0.2	0.3	0.2	
Grand Total	521.0	100.0	126.7	100.0	100.3

Table 20. Total number, weight, and average relative weight (W_r) of fish by species caught with electrofishing and gillnetting in Hells Canyon Reservoir on June 18, 2014.

Species	Number fish	Percent of total	Total weight (kg)	Percent of total weight	Average Wr
Smallmouth Bass	267	62.7	27.1	24.6	98.9
Channel Catfish	54	12.7	23.1	21.0	88.1
Bridgelip Sucker	24	5.6	2.1	1.9	
Northern Pikeminnow	20	4.7	3.8	3.5	
Rainbow Trout	17	4.0	4.9	4.4	94.5
Largescale Sucker	14	3.3	14.2	12.9	
Common Carp	11	2.6	30.1	27.3	
Chiselmouth	5	1.2	0.6	0.6	
Black Crappie	3	0.7	0.7	0.7	99.3
White Crappie	3	0.7	0.8	0.8	89.6
Kokanee	3	0.7	1.9	1.7	118.0
Yellow Perch	3	0.7	0.6	0.5	102.5
Bluegill	2	0.5	0.3	0.2	130.7
Grand Total	426	100.0	110.2	100.0	96.4

Table 21. Total number, average weight, and average relative weight (W_r) by species and length group collected with gill nets from Oxbow Reservoir on June 18, 2014.

Species Length group (mm)	Number fish	Total weight (kg)	Average weight(g)	Average Wr
Black Crappie				
130-139	1	0.1	50	151.5
140-149	2	0.1	53	140.6
150-159	3	0.2	62	132.7
160-169	2	0.2	78	118.2
180-189	3	0.3	113	117.6
190-199	3	0.4	119	117.3
Black Crappie Total	14	1.2	85.4	126.6
Channel Catfish				
130-139	1	0.0	18	128.6
290-299	3	0.5	175	82.9
300-309	2	0.4	208	87.6
310-319	5	1.0	207.8	80.6
330-339	1	0.3	300	88.5
340-349	5	1.7	334	91.3
350-359	5	1.6	320	80.6
360-369	2	0.7	347.5	79.3
370-379	1	0.4	350	76.1
390-399	2	0.8	418	73.9
400-409	2	1.2	575	96.9
410-419	1	0.7	650	95.3
420-429	1	1.0	1000	144.3
430-439	3	2.2	733	96.9
460-469	2	2.0	1012.5	102.6
520-529	1	1.6	1550	106.5
540-549	1	1.8	1750	110.3
560-569	2	3.8	1900	104.7
570-579	1	2.3	2250	112.7
700-709	1	4.6	4570	120.8
Channel Catfish Total	42	28.4	676	92.3
Smallmouth Bass				
60-69	1	0.0	2	100.0
70-79	3	0.0	6	120.0
80-89	5	0.0	8	114.3
90-99	4	0.0	12	136.3
100-109	1	0.0	30	250.0
120-129	8	0.2	28	118.1
130-139	23	0.9	40	128.1
140-149	20	0.9	46	125.1
150-159	8	0.4	46	99.0
160-169	7	0.4	56	97.2
170-179	13	1.0	73.2	107.3

Table 21. cont.

Species Length group (mm)	Number fish	Total weight (kg)	Average weight(g)	Average Wr
180-189	44	3.5	80	100.4
190-199	56	5.4	97	99.7
200-209	59	6.8	116	101.8
210-219	49	6.4	130	100.3
220-229	17	2.7	157.5	102.1
230-239	10	2.0	195	112.7
240-249	4	0.8		
250-259	8	1.7	212	92.3
260-269	5	1.1	227.5	84.5
280-289	6	1.6	258	77.5
290-299	6	2.0	330	87.8
300-309	12	4.4	363.6	87.3
310-319	2	0.8	410	85.1
320-329	3	1.3	423	81.5
330-339	3	1.5	500	93.1
340-349	7	3.4	470	76.7
350-359	2	1.1	540	76.8
360-369	5	2.8	566	77.4
370-379	3	2.0	653	84.4
380-389	2	1.3	620	71.7
390-399	2	1.5	750	79.5
400-409	2	1.6	805	77.3
Smallmouth Bass Total	400	59.6	206.1	101.1
Bluegill				
110-119	2	0.1	33	114.5
150-159	1	0.1	60	83.3
180-189	1	0.1	136	105.4
210-219	1	0.2	236	106.3
Bluegill Total	5	0.5	99.6	104.8
Bridgelip Sucker				
210-219	1	0.1	110	
230-239	1	0.1	136	
Bridgelip Sucker Total	2	0.2	123	
Chiselmouth				
280-289	1	0.2	225	
300-309	1	0.3	300	
Chiselmouth Total	2	0.5	262.5	
Common Carp				
340-349	1	0.6	640	
Common Carp Total	1	0.6	640	
Largescale Sucker				
50-59	1	0.0	4	
400-409	1	1.0	1000	

Table 21. cont.

Species Length group (mm)	Number fish	Total weight (kg)	Average weight(g)	Average Wr
420-429	2	2.0	1000	
460-469	1	1.0	1000	
510-519	1	1.5	1500	
520-529	1	1.8	1750	
550-559	1	2.0	2000	
590-599	3	7.0	2317	
650-659	1	3.0	3000	
Largescale Sucker Total	12	19.2	1600	
Mottled Sculpin				
120-129	1	0.0	20	
Mottled Sculpin Total	1	0.0	20	
Northern Pikeminnow				
150-159	1	0.0	38	
190-199	1	0.1	84	
240-249	1	0.1	132	
270-279	1	0.2	190	
280-289	1	0.3	270	
290-299	1	0.2	240	
310-319	2	0.7	325	
320-329	1	0.4	360	
330-339	4	1.4	342	
340-349	3	1.2	400	
350-359	5	2.2	436	
360-369	5	2.3	454	
370-379	3	1.5	483	
380-389	3	1.8	565.5	
430-439	1	0.8	750	
490-499	1	0.6	600	
560-569	1	1.1	1050	
Northern Pikeminnow Total	35	14.6	411	
Rainbow Trout				
150-159	1	0.0	29	78.4
260-269	2	0.3	150	76.9
270-279	1	0.2	230	98.7
290-299	1	0.2	240	85.4
400-409	1	0.6	616	88.0
Rainbow Trout Total	6	1.4	236	84.0
Whitefish (Var. Sp. Prosopium)				
330-339	1	0.3	300	
Whitefish (Var. Sp. Prosopium) Total	1	0.3	300	
Grand Total	521	126.7	386	100.5

Table 22. Total number, average weight, and average relative weight (W_r) by species and length group collected with gill nets from Hells Canyon Reservoir on June 17, 2014.

Species Length group	Number fish	Average weight(g)	Average Wr
Smallmouth Bass			
60-69	1.0	6.0	
70-79	2.0	9.0	
80-89	1.0	10.0	
90-99	1.0	12.0	
100-109	1.0	20.0	
110-119	5.0	22.5	
120-129	5.0	28.0	
130-139	17.0	30.4	103.6
140-149	11.0	42.0	113.0
150-159	19.0	49.0	108.4
160-169	5.0	56.2	98.5
170-179	8.0	72.0	105.0
180-189	14.0	84.0	104.6
190-199	47.0	89.8	92.6
200-209	59.0	103.4	92.0
210-219	26.0	117.5	89.8
220-229	5.0	138.0	93.0
230-239	9.0	139.2	81.3
240-249	4.0	166.3	84.4
250-259	6.0	180.7	79.2
260-269	5.0	214.0	83.4
270-279	2.0	235.0	78.6
280-289	6.0	267.6	82.6
290-299	2.0	275.5	75.5
300-309	1.0	320.0	80.8
310-319	4.0	345.0	77.5
340-349	1.0	420.0	71.1
Smallmouth Bass Total	267.0	113.8	98.9
Channel Catfish			
220-229	1.0	90.0	109.8
260-269	1.0	225.0	158.5
280-289	2.0	150.0	82.4
290-299	2.0	187.5	91.9
300-309	4.0	201.3	88.3
310-319	6.0	222.5	86.5
320-329	6.0	235.0	83.0
330-339	6.0	253.7	78.8
340-349	5.0	281.2	79.3
350-359	2.0	310.0	79.4
360-369	2.0	342.5	82.1
370-379	4.0	408.0	86.9
380-389	4.0	385.5	76.4
400-409	2.0	590.0	98.0
410-419	1.0	550.0	85.9

Table 22. Cont.

Species Length group	Number fish	Average weight(g)	Average Wr
460-469	1.0	1000.0	107.0
490-499	1.0	1425.0	123.7
540-549	2.0	1717.5	108.3
550-559	1.0	1560.0	92.6
580-589	1.0	2050.0	101.0
Channel Catfish Total	54.0	428.6	88.1
Black Crappie			
200-209	1.0	150.0	126.1
240-249	1.0	230.0	98.7
300-309	1.0	360.0	73.2
Black Crappie Total	3.0	246.7	99.3
Bluegill			
140-149	1.0	70.0	127.3
190-199	1.0	204.0	134.2
Bluegill Total	2.0	137.0	130.7
Bridgelip Sucker			
80-89	1.0	5.0	
100-109	1.0	12.0	
110-119	1.0	20.0	
130-139	1.0	20.0	
140-149	2.0	25.0	
150-159	1.0	40.0	
160-169	4.0	60.0	
170-179	3.0	60.0	
180-189	1.0	68.0	
200-209	2.0	105.0	
210-219	2.0	108.0	
220-229	1.0	140.0	
250-259	1.0	190.0	
260-269	1.0	200.0	
270-279	2.0	235.0	
Bridgelip Sucker Total	24.0	85.9	
Chiselmouth			
150-159	1.0	50.0	
210-219	1.0	125.0	
220-229	1.0	132.0	
230-239	2.0	151.5	
Chiselmouth Total	5.0	122.0	
Common Carp			
500-509	1.0	1600.0	
510-519	1.0	1600.0	
520-529	1.0	1750.0	
530-539	1.0	2250.0	
560-569	2.0	2425.0	
570-579	1.0	2500.0	
600-609	1.0	3000.0	
620-629	1.0	3750.0	
670-679	2.0	4375.0	
Common Carp Total	11.0	2731.8	

Table 22. Cont.

Species Length group	Number fish	Average weight(g)	Average Wr
Kokanee (Early Spawner)			
300-309	1.0	640.0	217.7
440-449	2.0	624.0	68.2
Kokanee (Early Spawner) Total	3.0	629.3	118.0
Largescale Sucker			
240-249	1.0	150.0	
300-309	1.0	322.0	
410-419	1.0	810.0	
420-429	1.0	818.0	
440-449	1.0	1000.0	
450-459	2.0	827.5	
460-469	1.0	1250.0	
480-489	2.0	1150.0	
500-509	1.0	1300.0	
530-539	1.0	1500.0	
590-599	2.0	1550.0	
Largescale Sucker Total	14.0	1014.6	
Northern Pikeminnow			
160-169	2.0	48.0	
170-179	1.0	60.0	
190-199	2.0	80.0	
220-229	2.0	120.0	
230-239	1.0	150.0	
240-249	3.0	156.0	
250-259	2.0	167.0	
260-269	3.0	228.3	
270-279	1.0	200.0	
330-339	1.0	378.0	
370-379	1.0	450.0	
400-409	1.0	600.0	
Northern Pikeminnow Total	20.0	196.9	
Rainbow Trout			
190-199	1.0	84.0	109.1
210-219	1.0	90.0	90.9
230-239	1.0	121.0	87.7
250-259	1.0	180.0	100.6
270-279	3.0	236.0	108.1
280-289	2.0	243.0	98.6
290-299	1.0	290.0	109.4
300-309	2.0	285.5	94.9
350-359	1.0	388.0	80.8
370-379	2.0	450.0	81.4
390-399	1.0	500.0	77.0
410-419	1.0	580.0	76.8
Rainbow Trout Total	17.0	288.1	94.5
White Crappie			
130-139	1.0	28.0	112.0

Table 22. Cont.

Species Length group	Number fish	Average weight(g)	Average Wr
310-319	1.0	380.0	79.0
320-329	1.0	420.0	77.9
White Crappie Total	3.0	276.0	89.6
Yellow Perch			
170-179	1.0	80.0	111.1
250-259	1.0	230.0	100.9
270-279	1.0	283.0	95.6
Yellow Perch Total	3.0	197.7	102.5
Grand Total	426.0	332.1	96.4

Table 23. Number of Smallmouth Bass collected greater than stock, quality, and preferred sizes and incremental Relative Stock Densities (RSD) of Smallmouth Bass collected during fishery surveys in Oxbow and Hells Canyon Reservoirs in June 2014.

Lake	# Stock	# Quality	# Preferred	RSD-300	RSD-400
Oxbow	320	56	15	18	5
Hells Canyon	267	11	0	4	0

**Stock = 180 mm, Quality = 300 mm, Preferred = 400

Table 24. Incremental Relative Stock Densities of Smallmouth Bass collected with boat electrofishing in Oxbow and Hells Canyon Reservoirs in 2003, 2008 and 2014.

	2003		2008		2014	
Lake	RSD-300	RSD-400	RSD-300	RSD-400	RSD-300	RSD-400
Oxbow	26	3	49	1	18	5
Hells Canyon	4	0	17	0	4	0

Table 25. Payette Lake Kokanee spawner counts and estimated spawning run size and biomass from 1988 through 2014 in the North Fork Payette River.

Year	Peak count	Estimated number of spawners	KG/Lake HA_1	Number/Lake HA_1	Average spawner weight (g)	Average spawner total length (mm)
1988	13,200	22,800	4.6	13.3	346	--
1989	8,400	14,500	2.9	8.4	349	--
1990	9,642	16,700	3.5	9.7	358	--
1991	10,400	18,000	5.3	10.5	505	365
1992	16,945	29,300	6.4	17.1	377	
1993[a]	34,994	59,310	8.5	34.6	245	--
1994	25,550	44,200	5.5	25.8	214	--
1995	32,050	55,450	4.8	32.3	147	260
1996	35,090	60,707	5.7	35.4	162 [c]	--
1997[d]	36,300[e]	64,891	5.6	37.8	148	265
1998	14,585	25,232	2.1	14.7	143	254
1999	15,590	26,971	2.9	15.7	184	276
2000	15,520	26,850	2.9	15.6	188	286
2001[F]	15,690[g]	30,144	4.4	17.6	250[b]	--
2002	9,430	16,314	--	9.5	--	--
2003	5,430	9,394	1.5	5.5	279	--
2004	11,290	19,532	--	11.4	--	--
2005	11,780	20,780	--	12.1	--	--
2006	5,580	9,650	--	5.6	--	317
2007	3,925	6,790	1.6	4.0	401	340
2008	2,425	4,195	--	2.4	--	336
2009	1,290	2,232	--	1.3	--	405
2010	610	1,055	--	0.6	--	416
2011	435	753	--	0.4	--	390
2012	852	1,475	--	0.8	--	376/440[h]
2013	304	526	--	0.3	--	384/458[h]
2014	245	424		0.2	--	-

[1] 1,717 ha usable Kokanee habitat in Payette Lake (Area with depth greater than 40 feet).
[a] Estimate made from stream and weir counts (Frost and Bennett, 1994)
[b] From gill net data of captured spawners in Payette Lake during lake survey.
[c] From trawling collections made in September 1996.
[d] Includes 2,092 fish spawned and removed by Nampa Fish Hatchery.
[e] Does not include 2,092 fish spawned and removed by Nampa Fish Hatchery.
[f] Includes 3,000 fish spawned and removed by Nampa Fish Hatchery.
[g] Does not include 3,000 fish spawned and removed by Nampa Fish Hatchery.
[h] Two distinct age classes.

Table 26. Bus route creel survey day length, shift length, and total wait times for North Fork Payette River in October and November 2014.

	October (min)	November (min)
Mean day length	720	600
Shift length	360	300
Wait time*	300	240

*Wait time = Shift length - Travel Time

Table 27. Bus route creel survey access sites and wait times by month for North Fork Payette River in October and November 2014.

Access site	October wait times (min)	November wait times (min)
IDFG Hatchery/Lardo	18	15
Hwy Bypass Bridge	18	15
Rivers Crossing Subdivision	38	30
Meckel Gravel Pit	38	30
Smiley Lane Bridge Area	56	45
Hat Ranch BLM Property	38	30
Payette Subdivision	38	30
Sheep Bridge	56	45

FIGURES

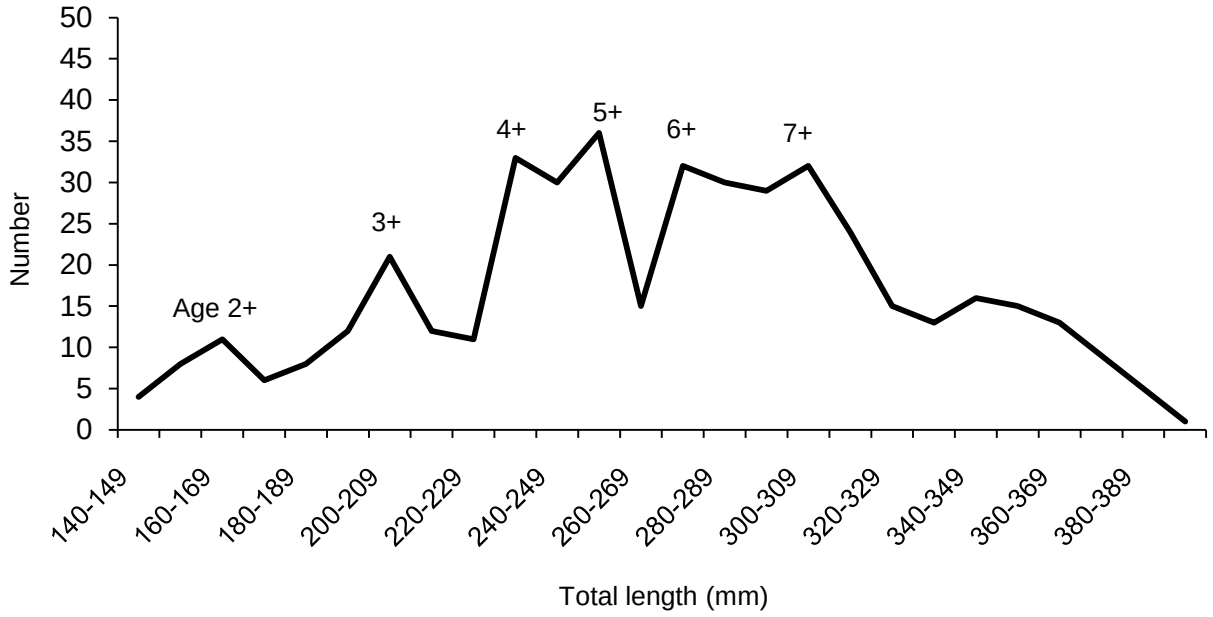

Figure 1. Length frequency histogram and ages of Yellow Perch *Perca flavescens* collected with gill nets in Lake Cascade in October 2014.

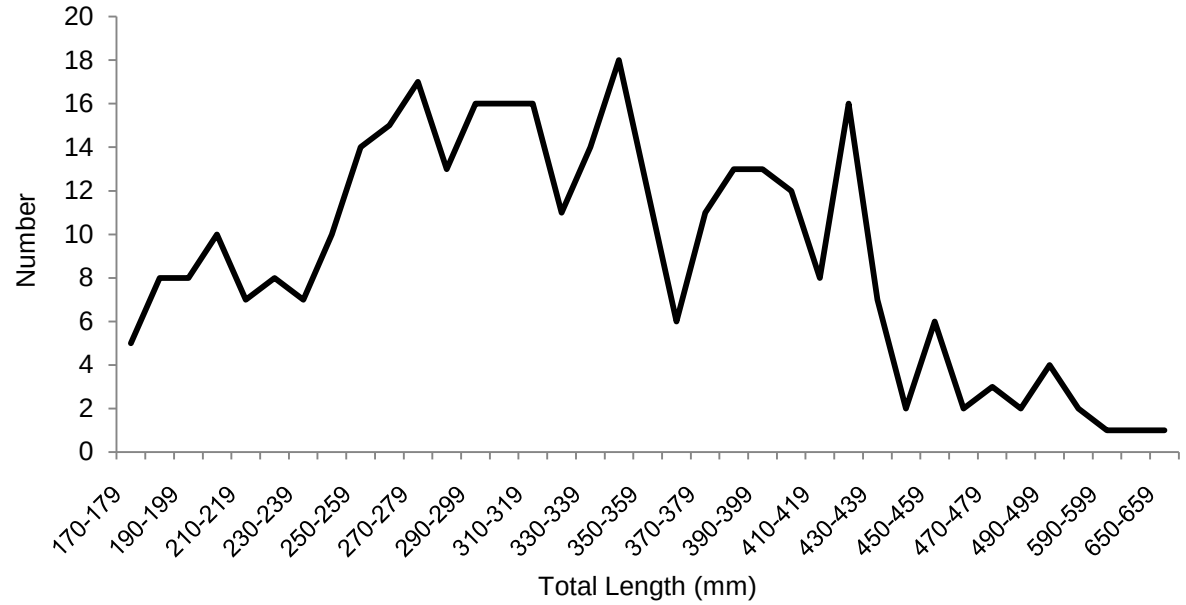

Figure 2. Length frequencies of Northern Pikeminnow collected with gill nets in Lake Cascade in October 2014.

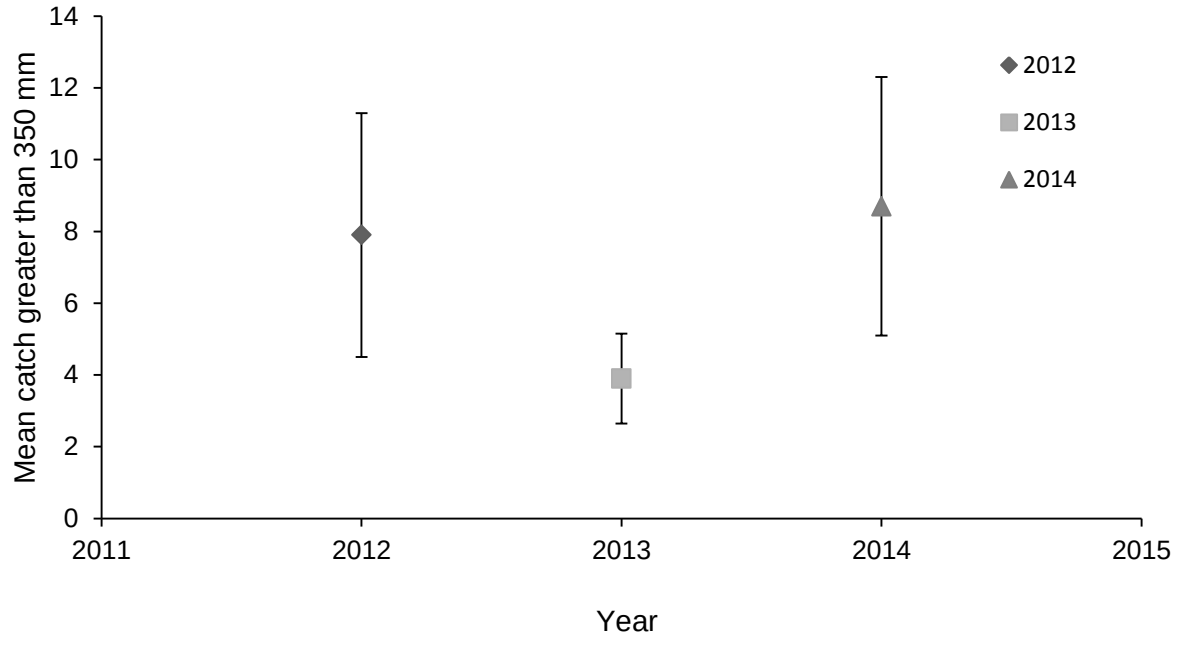

Figure 3. Mean catch of Northern Pikeminnow greater than 350 mm with 90% confidence intervals collected with gill nets in Lake Cascade in October 2012, 2013, and 2014.

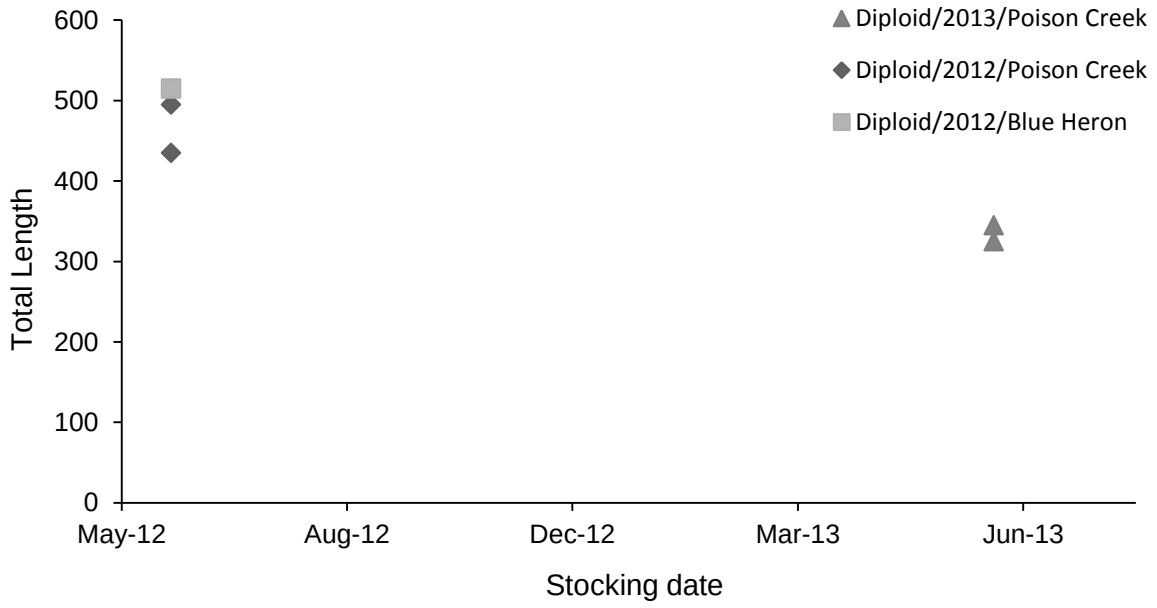

Figure 4. Total Length of grit marked Rainbow Trout by stocking date collected with gill nets in October 2014.

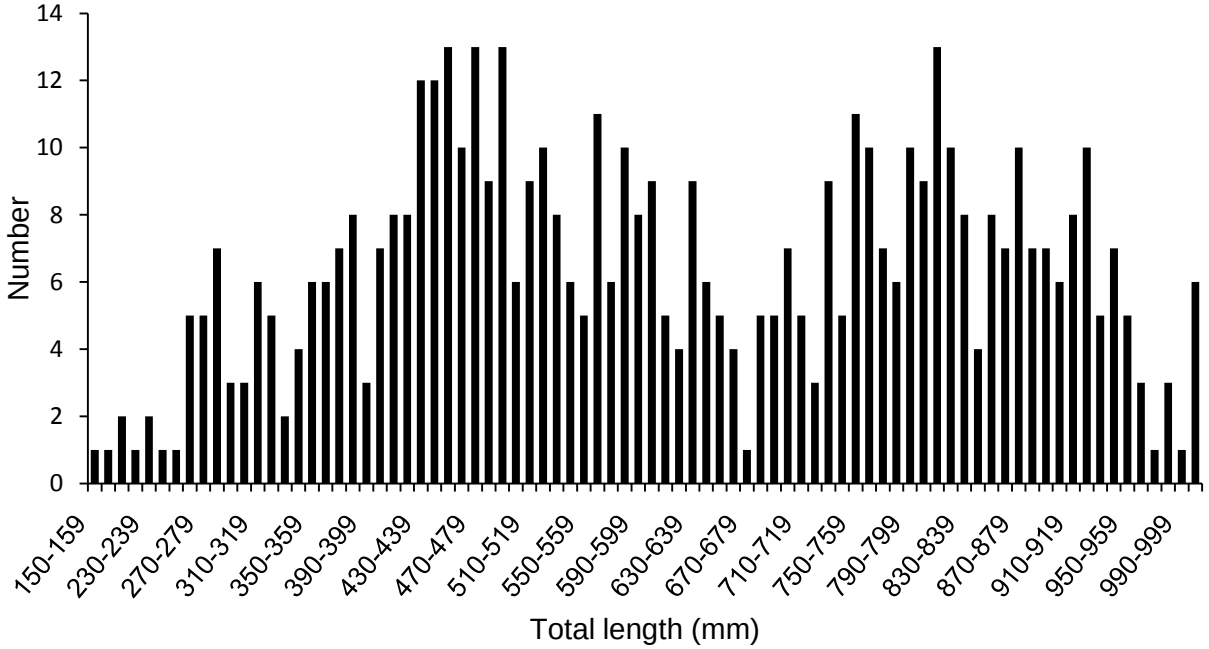

Figure 5. Length Frequencies of Lake Trout collected with gill nets from Payette Lake from May 1 through October 3, 2014.

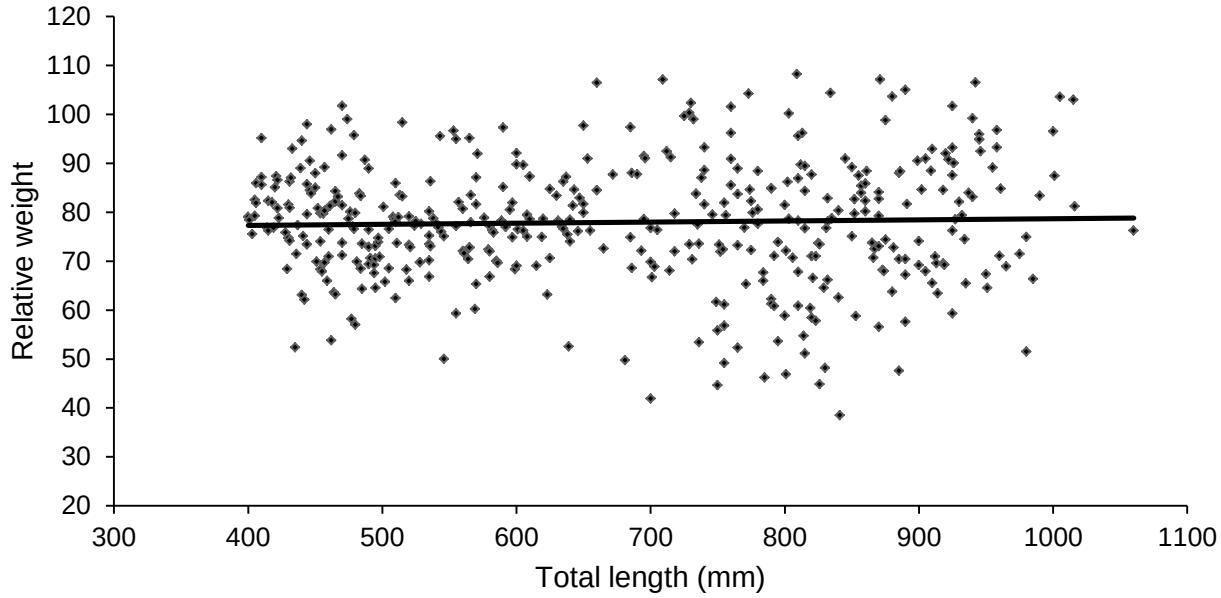

Figure 6. Relative weight by total length of Lake Trout collected with gill nets from Payette Lake in 2014.

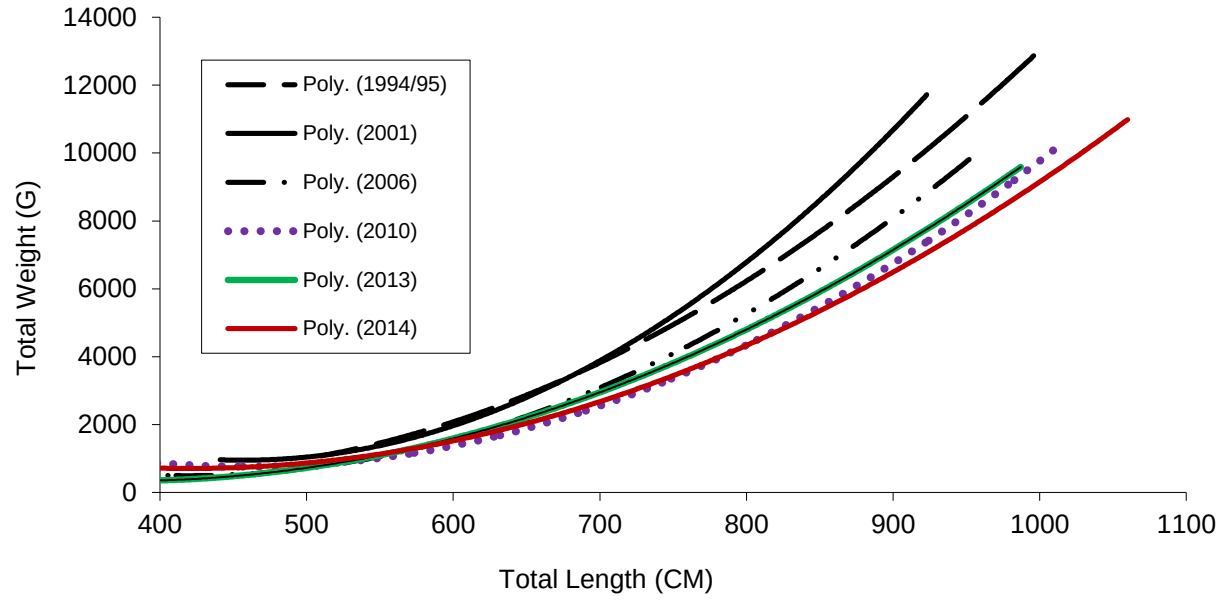

Figure 7. Weight to total length relationship polynomial trend lines of Lake Trout collected in 1994/95, 2001, 2006, 2010, 2013, and 2014.

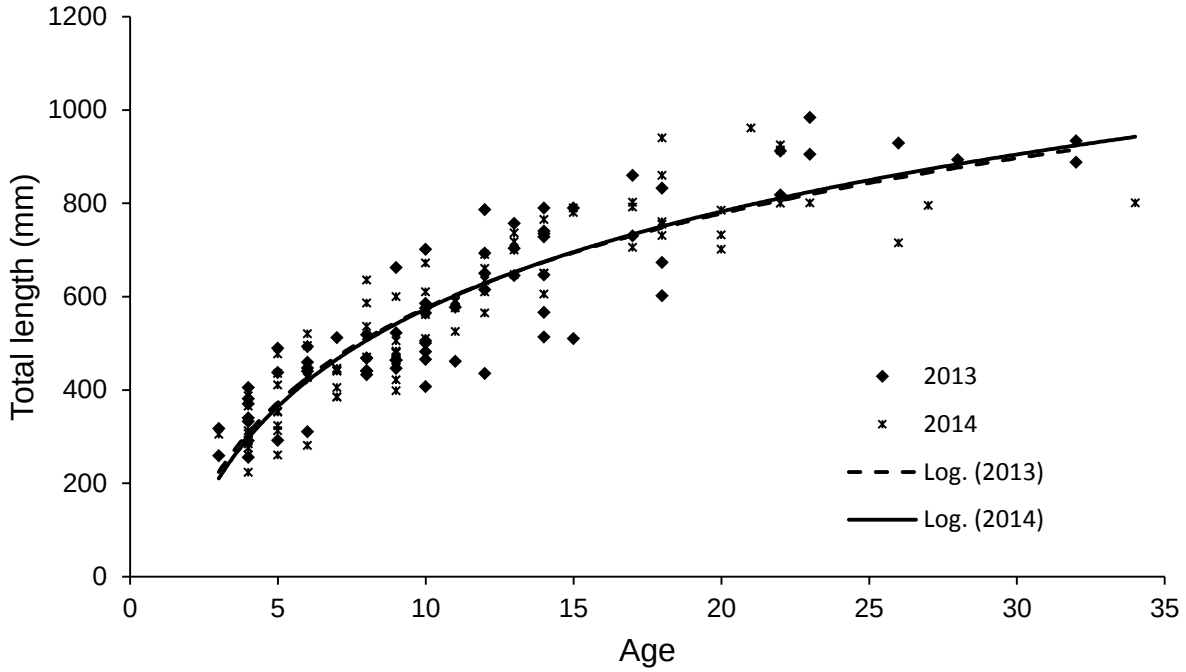

Figure 8. Total length at age of Lake Trout collected with gill nets from Payette Lake in 2013 and 2014. (Two years subtracted from 2013 read ages due to ageing issues discussed in above text.)

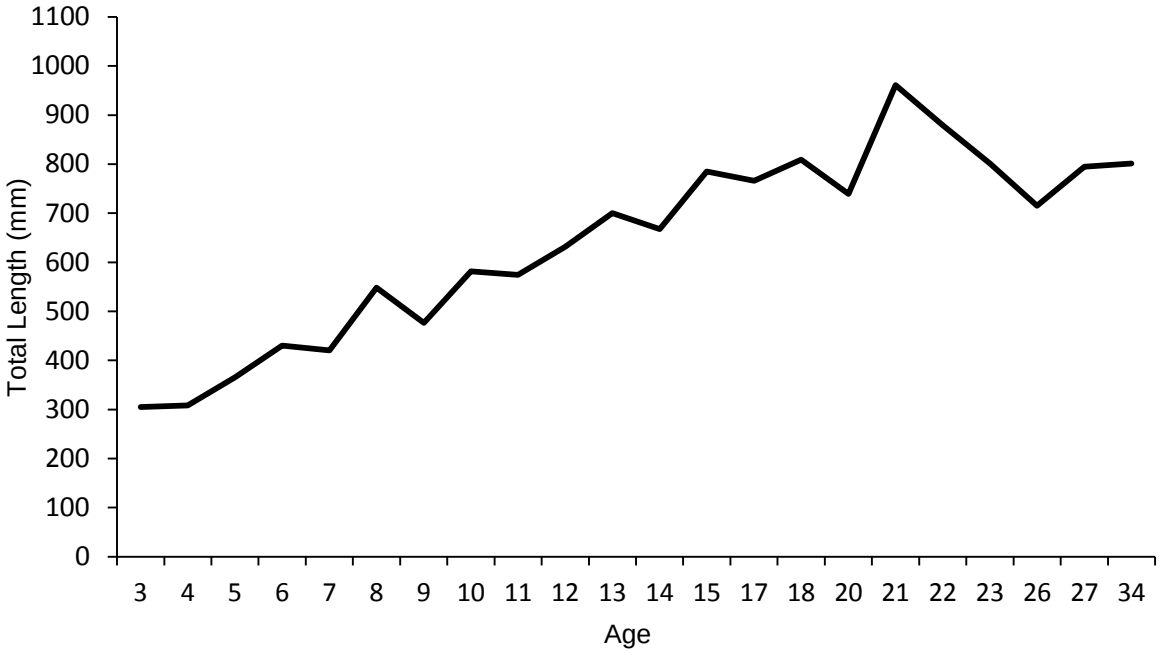

Figure 9. Mean total length at age of Lake Trout collected with gillnets from Payette Lake in 2014.

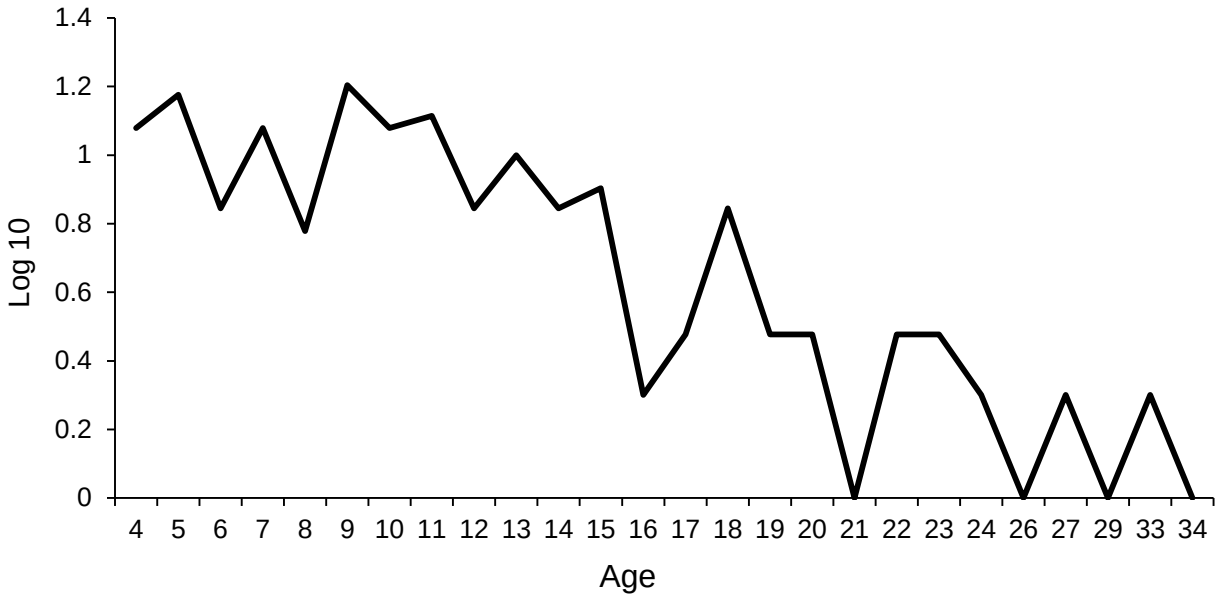

Figure 10. Catch curve of Lake Trout collected with gill nets in Payette Lake in 2013 and 2014 combined (added one year to 2013 ages to match 2014)

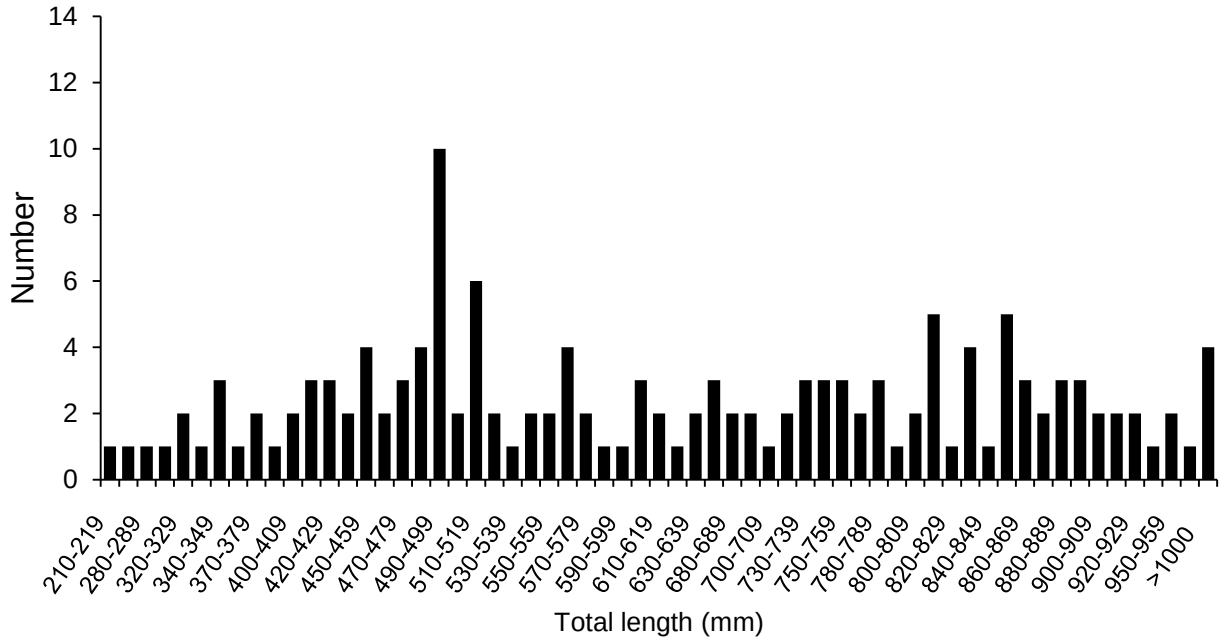

Figure 11. Length Frequencies of Lake Trout collected with gill nets from Payette Lake in September and October 2014.

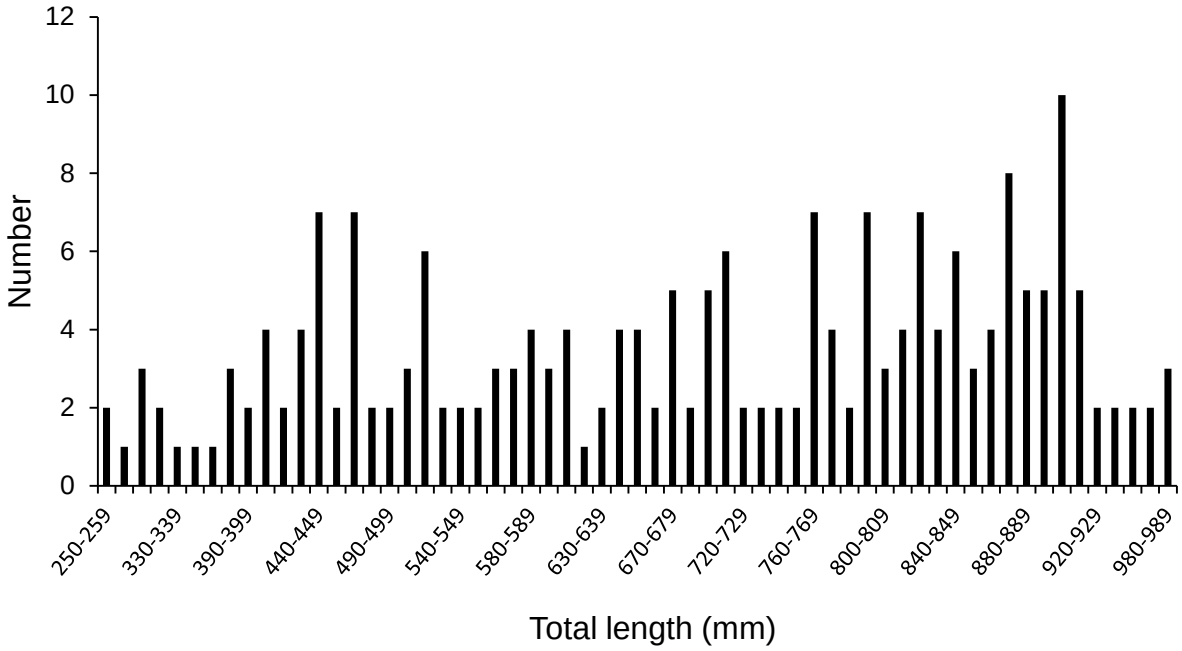

Figure 12. Length frequencies of Lake Trout collected with gill nets in Payette Lake in 2013.

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