Results from the 2015 Fall Walleye Index Netting Surveys in Washington State

Washington Department of FISH and WILDLIFE

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Abstract

We conducted Fall Walleye Index Netting (FWIN) surveys on five lakes in central and eastern Washington (Lake Roosevelt, Banks Lake, Moses Lake, Potholes Reservoir and Scooteney Reservoir) in fall 2015 to monitor population abundance and biological parameters of Walleye *Sander vitreus*. Walleye abundance, measured in terms of gill net catch-per-unit-effort (CPUE), decreased from 2014 on all waters except Scooteney Reservoir. Moses Lake and Potholes Reservoir had the most significant decreases in Walleye abundance from 2014. Despite these declines, these populations are still healthy and contain high numbers of Walleye in multiple year-classes. The increase in CPUE on Scooteney Reservoir was due to a very large age-1 year class. Moses Lake, Potholes Reservoir and Banks Lake had the highest percentage of Walleye at least 16 inches. Moses Lake and Potholes Reservoir had the fastest growing fish, with Walleye reaching 18 inches by fall at age–2. In addition to Walleye, Lake Whitefish were very abundant in Lake Roosevelt and Banks Lake, representing 28% and 25% of the total fish collected on those waters, respectively. Yellow Perch were very abundant on Banks Lake, Moses Lake, and Scooteney Reservoir with a high percentage over 8 inches. Yellow Perch declined in abundance on Potholes Reservoir from 2014. Walleye anglers should find excellent fishing opportunities on all our FWIN waters, but anglers in search of larger Walleye should focus their effort on Moses Lake and Potholes Reservoir.

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Introduction

Walleye *Sander vitreus* represents an important recreational fishery resource in Washington and is an incredibly popular sport fish among recreational anglers. Since the 1980s there has been a growing demand for quality Walleye fisheries in Washington. Routine monitoring and evaluation of sport fisheries is essential in order to make effective and timely management decisions. One aspect of Walleye management is to maximize recreational opportunities for anglers while maintaining healthy, balanced fish communities. This includes recognizing when abundant harvest opportunities exist in Walleye fisheries and ensuring recreational anglers are made aware of these opportunities.

The Washington Department of Fish and Wildlife (WDFW) began monitoring important Walleye populations in Washington in 2002 using the Fall Walleye Index Netting (FWIN) methodology (Morgan 2000). The FWIN methodology was developed in Ontario, Canada as a means of monitoring a wide variety of biological parameters in Walleye populations in a standardized fashion using gill nets.

Each fall since 2002, staff from WDFW, Confederated Tribe of the Colville Reservation and the Spokane Tribe of Indians, along with numerous volunteers, has collected biological information on Walleye from five populations in central and eastern Washington. This information has helped fisheries managers develop and shape Walleye angling regulations specific to those populations. Our principle goals are to maximize recreational opportunity and maintain healthy fish communities in lakes where Walleye are a primary predator and are targeted by anglers.

This report summarizes our findings from the 2015 FWIN surveys in Washington and provides anglers with updates on popular fisheries on FWIN lakes in Washington.

Methods

We conducted FWIN surveys on five Walleye lakes in central and eastern Washington: Lake Roosevelt (hereafter referred to as FDR) (*Stevens County*), Banks Lake, Moses Lake, Potholes Reservoir (*Grant County*) and Scooteney Reservoir (*Franklin County*) (FIGURE 1). The FWIN surveys were conducted in fall when surface water temperatures are 50–59°F. This temperature range is one at which Walleye are more equally distributed throughout lakes, increasing our opportunity to collect a representative sample of the entire Walleye population.

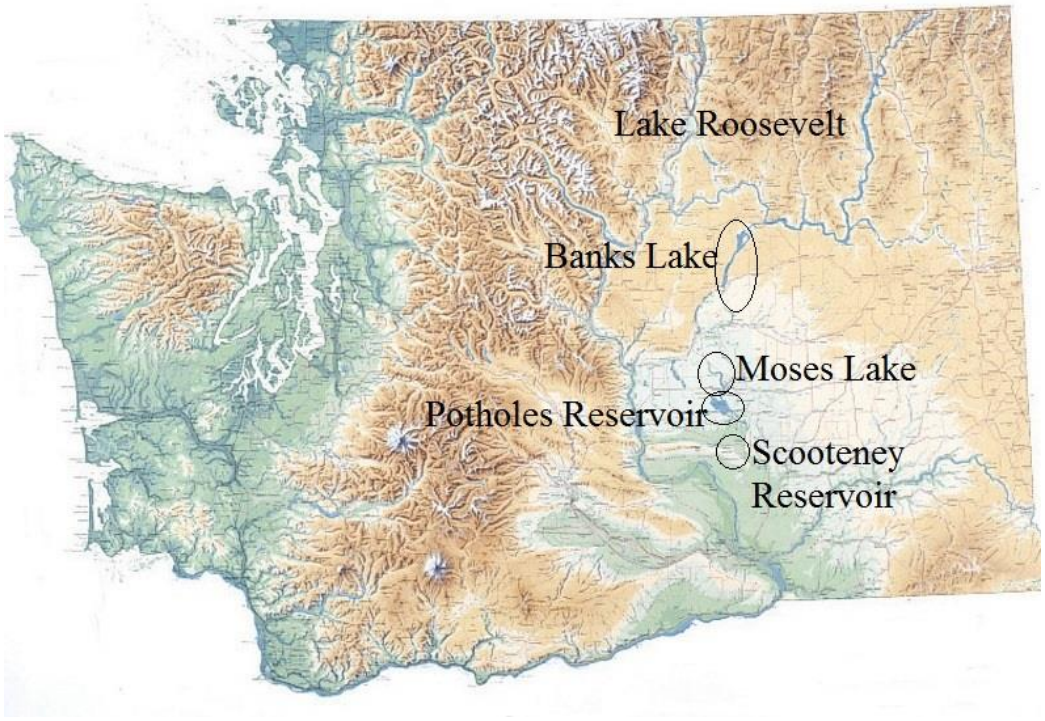

FIGURE 1. Map of FWIN lakes in Washington

The number of nets set per lake is based on two factors: Lake surface area and the number of Walleye collected. The recommended number of nets set per lake is based on lake acreage, with larger lakes receiving more sampling effort than smaller lakes (TABLE 1). This is an attempt to ensure comparable sampling effort for each lake.

The status of Walleye populations, as determined from a detailed assessment of biological parameters, can often be assessed from a sample of 300 Walleye. We continue FWIN sampling until 300 Walleye are collected or the recommended number of net sets is achieved, whichever occurs first. For Moses Lake and Potholes Reservoir the 300 Walleye benchmark was achieved before the recommended number of nets were set. For Banks Lake and Scooteney Reservoir the recommended number of net sets was reached prior to collecting 300 Walleye. On FDR we set the recommended number of FWIN nets despite having collected over 300 Walleye. This is

necessary in order to make a detailed assessment of the Walleye population on FDR due to its size and habitat diversity.

TABLE 1. Recommended number of FWIN net sets based on lake surface area in acres (Morgan et al. 2000).

Water Body	Surface Area (Acres)	Recommended # of net sets
Scooteney Reservoir	710	12
Moses Lake	6,800	18
Potholes Reservoir	14,281	36
Banks Lake	26,866	48
Lake Roosevelt	80,000	150

Net set locations are randomly chosen in order to not bias Walleye catch rates and each site is sampled once. Each FWIN net consists of eight, 25 ft. x 6 ft. panels of differing mesh size (1, 1.5, 2, 2.5, 3, 4, 5 and 6–inch) sewn together in ascending order. Nets were set in either shallow (6–15 ft.), deep (15–45 ft.) or pelagic (45+ ft.) water, on the lake bottom, and soaked for 21–24 hours overnight. Nets were set perpendicular to the shore from shallow to deep water and were set alternately with the small or large mesh end toward the shoreline. Nets were retrieved and returned to shore where fishes were removed, sorted and biological data were collected.

Total length (mm) and weight (g) were recorded for each fish collected. Walleye were processed further and additional biological data collected included: sex, sexual maturity, gonad weight and visceral fat weight (for condition factor). Sex and sexual maturity were determined by features described in Duffy et al. (2000). Otoliths were removed from all Walleye for age and growth determination.

Mean catch-per-unit-effort (CPUE ± 80% CI) is determined by enumerating the total number of Walleye collected and dividing by the total number of net sets. The 80% confidence intervals are a measure of the precision of mean CPUE based on variation in the number of Walleye collected per net. Yearly CPUE data were compared to the long-term (2002–2014) mean CPUE for each lake. It is important to understand that increases in Walleye abundance are primarily due to increases in Walleye production (age–0 Walleye); however, this increase is not detected until Walleye grow to a size that allows us to catch them effectively in gill nets. This is referred to as *recruiting to the gear*. Walleye typically recruit to FWIN nets at 8–12 inches (around age–1); however, in populations with faster growth (e.g. Moses Lake and Potholes Reservoir) this often occurs at age–0. Increases in Walleye abundance in a population may also be due to immigration of Walleye into a lake from a connected system. Our FWIN waters are connected via the Columbia Basin Irrigation Project; however, the degree to which immigration of Walleye affects population abundance is poorly understood. Our data suggest that increases in abundance are primarily due to increases of young fish.

Length frequency distribution is determined by enumerating the number of Walleye collected at each 4-inch length category and expressing these values as a percent of the total. This distribution was compared with the previous year as well as the long-term average length frequency distribution and was used to determine the percent of harvestable Walleye in the population. In this document we refer to this as the percentage of fish at least 16 inches. We have found this to be the size at which anglers prefer to begin harvesting Walleye (Responsive Management 2013), although we encourage anglers to retain all legal-sized Walleye.

Walleye ages were determined from otoliths, which provide a precise age estimate. Otoliths are fish ear bones, which have growth rings analogous to growth rings in a tree. Age distribution was determined by enumerating the number of Walleye collected at each age-class and expressing these values as a percent of the total. This distribution was compared with the previous year as well as the long-term average age distribution.

Understanding the age at which the majority of fish in a population reach sexual maturity allows fisheries managers to set regulations to reduce harvest on juvenile fish where necessary. The percent of mature Walleye at a given age is an indication of how many of these fish will spawn in the following year, not necessarily how many spawned the previous spring. Percent maturity was determined by calculating the percentage of male and female Walleye that were mature by fall at each age-class.

Length-at-age is determined by calculating the average length of Walleye at a given age. Comparisons were made to regional averages from northern and southern FWIN lakes. The northern lakes average is the regional length-at-age average for Walleye from FDR and Banks Lake from 2002–2014. Very few Walleye were collected above age–11 on either FDR or Banks Lake since 2002; therefore, length-at-age averages above age–11 from these lakes have inconsistent trends. Banks Lake and FDR are meso-oligotrophic reservoirs (Polacek 2013, McClellan et al. 1999). These lakes are characterized by moderately high transparency and low to moderate primary productivity which corresponds to slow growth of Walleye. The southern lakes average is the regional length-at-age average for Walleye from Moses Lake, Potholes Reservoir and Scooteney Reservoir. These lakes are eutrophic lakes characterized by low transparency and high primary productivity which corresponds to fast Walleye growth rates.

Relative abundance of other fish species are presented but may not be an accurate representation of those populations. Gill nets are used to collect fishes that have a fusiform body shape (spindle shaped; wide in the middle and tapered at each end) and that tend to be more active (e.g. Walleye and Yellow Perch). Low numbers of Largemouth Bass and Bluegill captured during a FWIN survey are not a cause for concern since these species tend to be more territorial and are more effectively sampled using other sampling methods. In addition, lengths of Smallmouth Bass collected in gill nets tend to be higher than those collected via boat electrofisher.

Results and Discussion

In 2015, the mean CPUE for all FWIN lakes combined was 20 Walleye per net. This is a decrease from 2014 (27) but is the third highest mean CPUE from all years. The only lake that had an increase in Walleye CPUE was Scooteney Reservoir. The most significant decrease in Walleye CPUE occurred on Moses Lake (FIGURE 2).

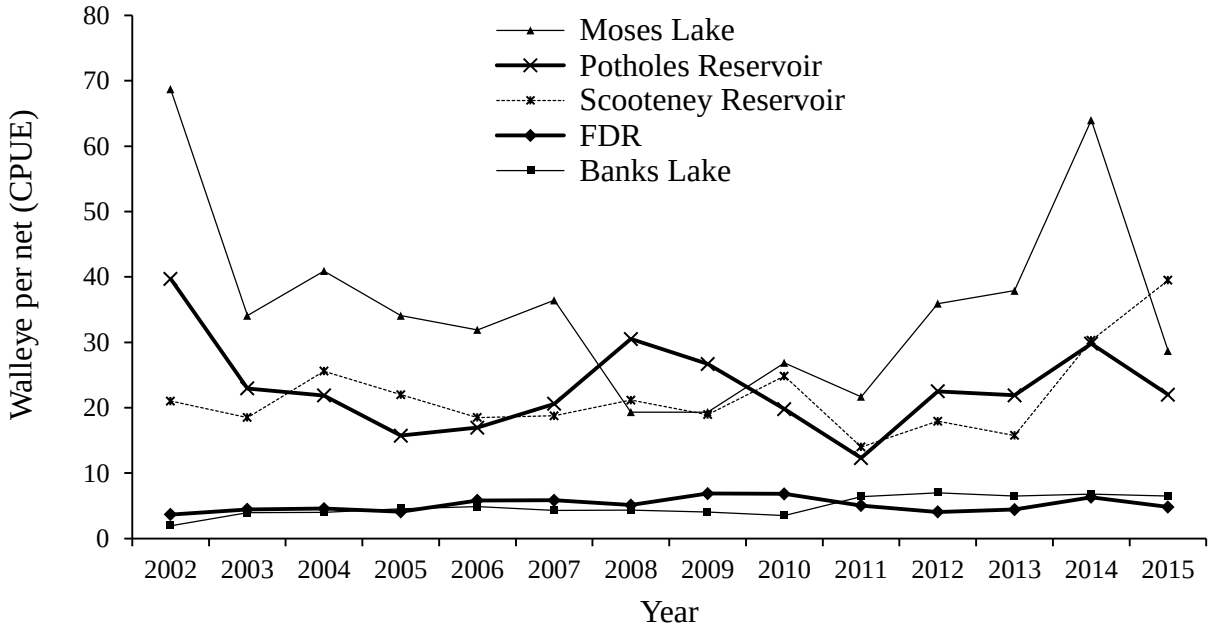

FIGURE 2. Distribution of Walleye CPUEs from all FWIN surveys conducted from 2002–2015.

Approximately 37% of the Walleye collected from all lakes were at least 16 inches. Moses Lake, Potholes Reservoir and Banks Lake had the three highest percentages of Walleye at least 16 inches, respectively (FIGURE 3). In 2015 the age–1 year-class was the most abundant collected on Scooteney Reservoir, Potholes Reservoir and Moses Lake, respectively. On Banks Lake the age–3 Walleye year-class was the most abundant collected and on FDR the age–2 year-class was the most abundant collected.

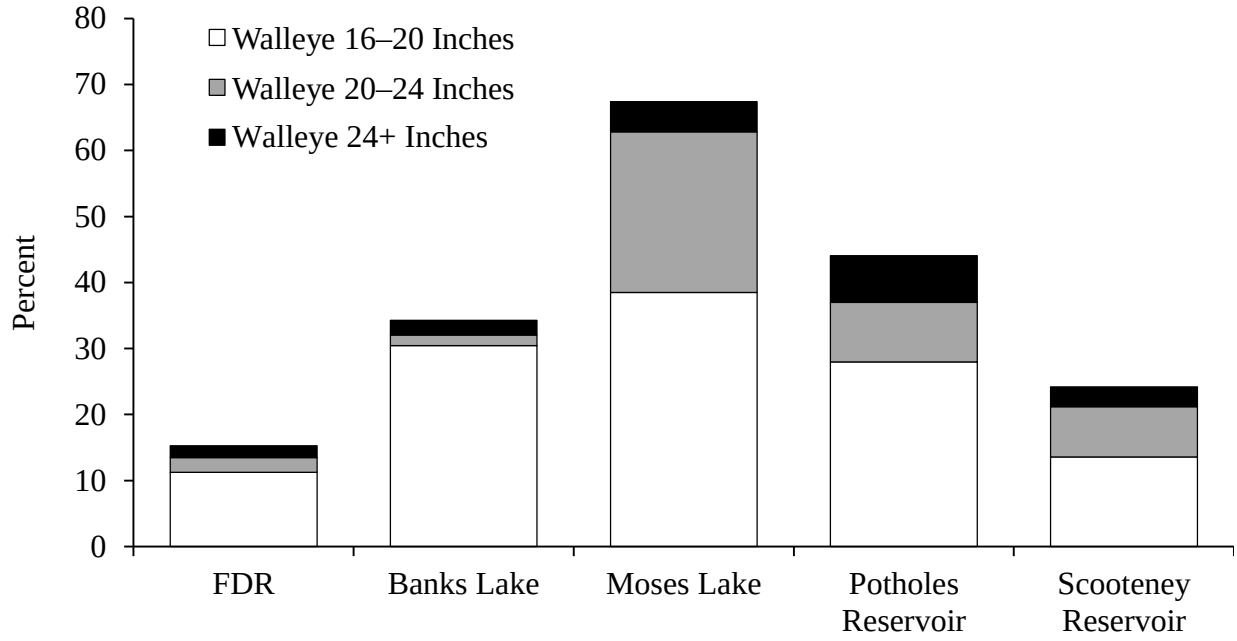

FIGURE 3. Percent of Walleye collected in three size classes during FWIN surveys in 2015. This figure excludes Walleye less than 16 inches.

Walleye from Moses Lake and Potholes Reservoir reached maturity faster than fish from other populations. On average, these fish reached 50% maturity by age–2. Walleye from FDR were the slowest to mature reaching 50% maturity by age–3 for males and age–5 for females.

Length-at-age of Walleye in Moses Lake and Potholes Reservoir was above the regional average with Walleye reaching 18 inches by fall as age–2. Length-at-age of Walleye in FDR and Banks Lake was below average with most Walleye reaching 15 inches by age–3.

Lake Roosevelt (FDR)

Walleye Population Sampling

We conducted the 2015 FDR FWIN survey November 2–5. A total of 150 FWIN nets were set throughout the reservoir and 720 Walleye were collected. The mean Walleye CPUE on FDR was 4.8 fish per net (FIGURE 4), which is a decrease from 2014 (6.8 Walleye per net) and below the long-term average, but is similar to what we found in 2013.

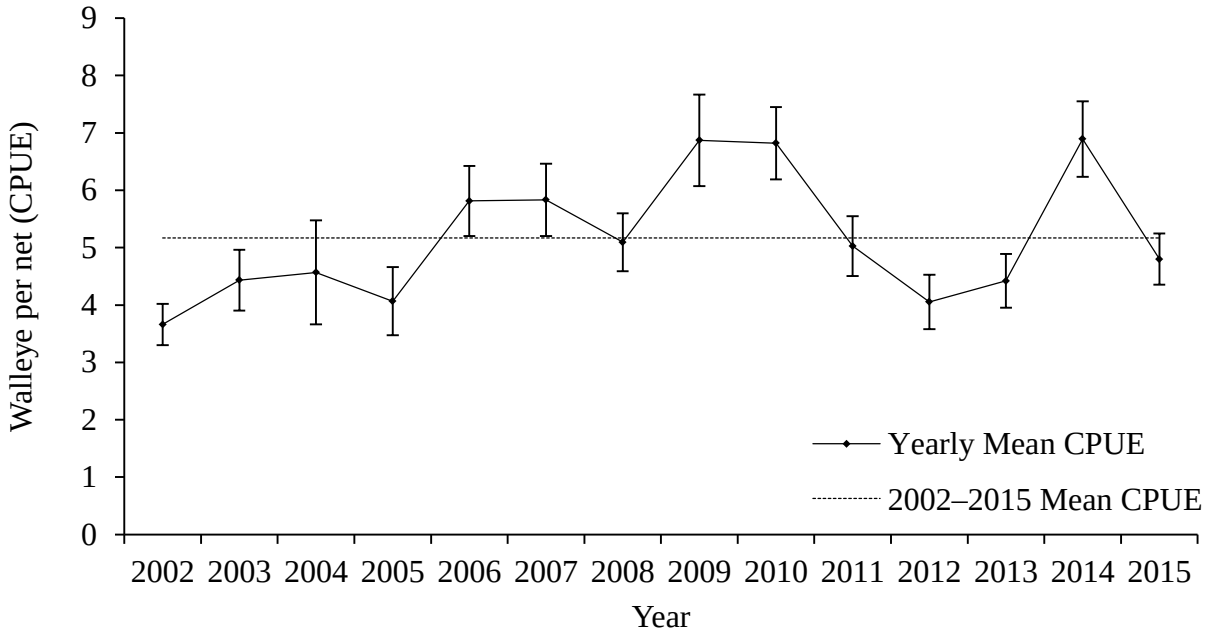

FIGURE 4. Yearly mean (± 80% CI) Walleye CPUE on FDR from 2002–2015 compared to the long-term (2002–2015) mean CPUE.

Walleye collected during FWIN on FDR averaged just over 13 inches in 2015. This is a slight increase from 2014 but is below the long-term average (14 inches). Approximately 15% of Walleye collected in 2015 were at least 16 inches (FIGURE 5). The relative abundance of Walleye in the 4–8 and 12–16 inch range increased and was above the long-term average in 2015; however, Walleye abundance decreased in 2015 and there will likely be fewer Walleye above 16 inches available for anglers to target in 2016.

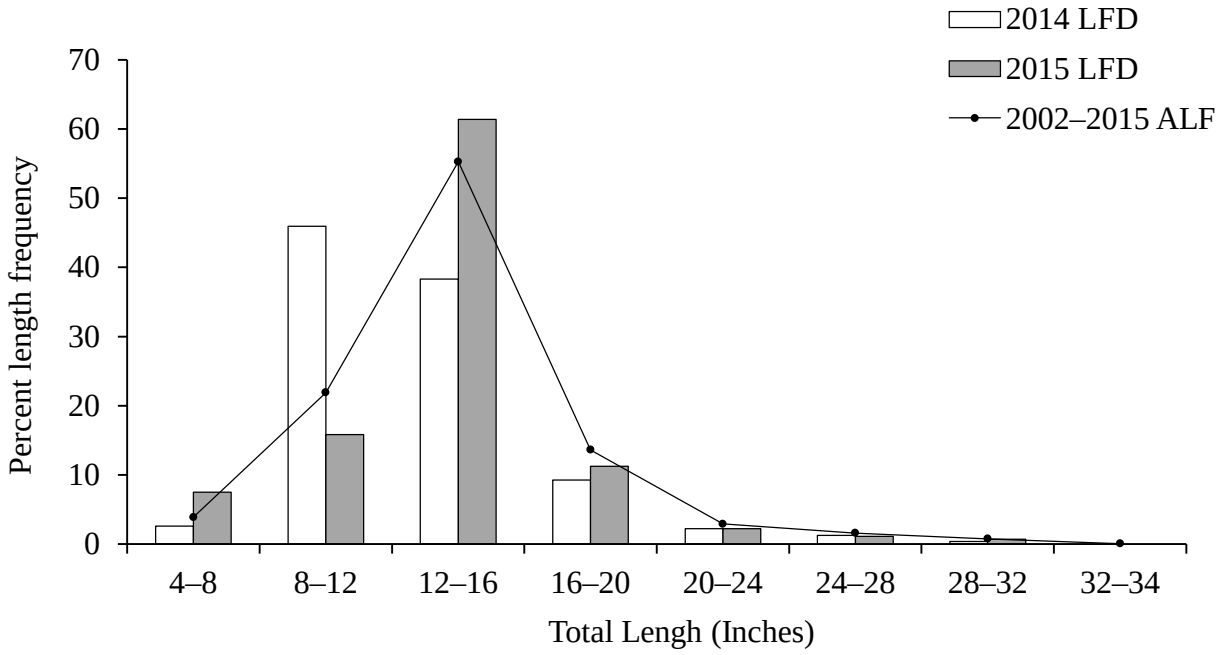

FIGURE 5. Percent length frequency distribution (LFD) of Walleye collected during FWIN on FDR in 2015 compared to 2014 and the average length frequency (ALF) from all FWIN surveys on FDR from 2002–2015.

A total of 13 age-classes were collected during the 2015 FDR FWIN survey, ranging from 0 to 13 years (FIGURE 6). No age–11 Walleye were collected and the age–1 and 2 year-classes were the most abundant collected. The age–2 year-class was well above the long-term average and Walleye in this age-class averaged 14 inches. The relative abundance of Walleye age–3 and above declined from 2014 and represented approximately 19% of our total catch.

FIGURE 6. Percent age distribution of Walleye collected during FWIN on FDR in 2015 compared to 2014 and the average age distribution from all FWIN surveys on FDR from 2002–2015.

Of the 720 Walleye collected in FDR a total of 165 (23%) were mature. Of these, 136 were male and 29 were female. Male Walleye in FDR began to mature by fall as age–2 fish (FIGURE 7). By fall as age–3 81% of male Walleye were mature and by age–4 100% were mature. Female Walleye were slower to mature reaching 50% mature by age–5 and 100% by age–6. When compared to Walleye from warmer, more productive waters (e.g. Moses Lake and Potholes Reservoir) Walleye in FDR were slow to mature. Walleye populations with slow growth and maturity are more sensitive to weak year-classes since proportionally fewer fish in the population are mature and it takes several years for fish to become mature.

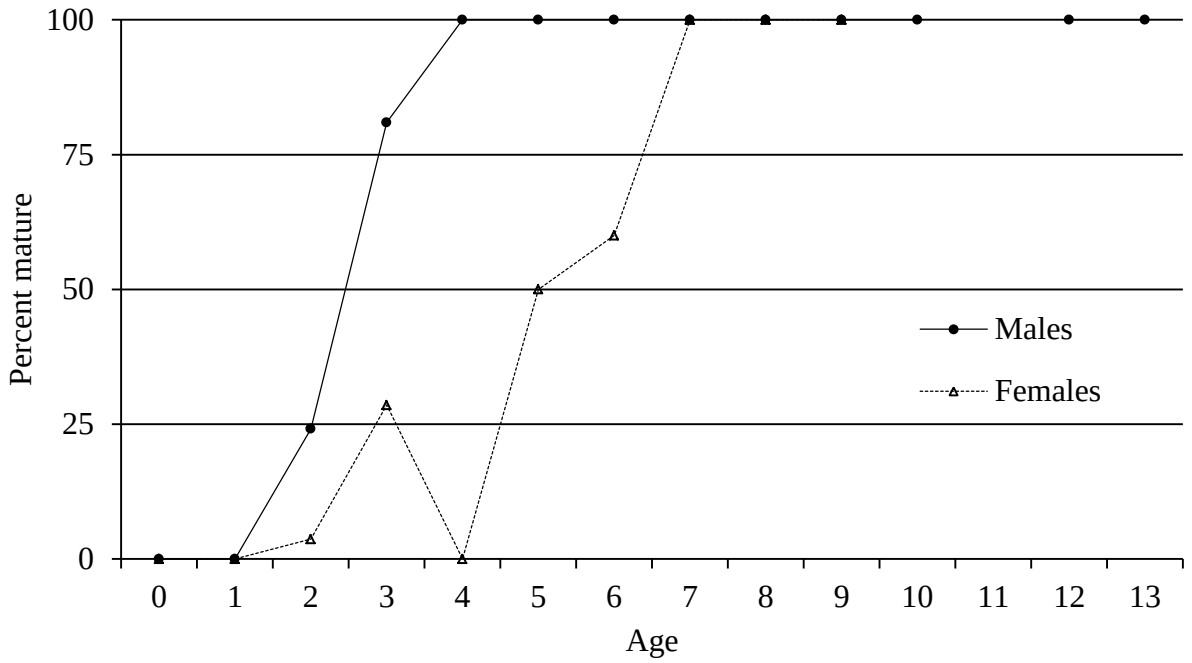

FIGURE 7. Percent of mature male and female Walleye at each age-class collected during FWIN on FDR in 2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Length-at-age of Walleye collected from FDR in 2015 was below both the northern and southern lakes average for Walleye out to age–12 (FIGURE 8). As stated previously, no age–11 Walleye were collected and beyond age–12 we do not have precise regional averages with which to make comparisons. Walleye in FDR had the slowest growth rates among all FWIN waters. On average, Walleye in FDR reached 16 inches by fall as age–4 fish.

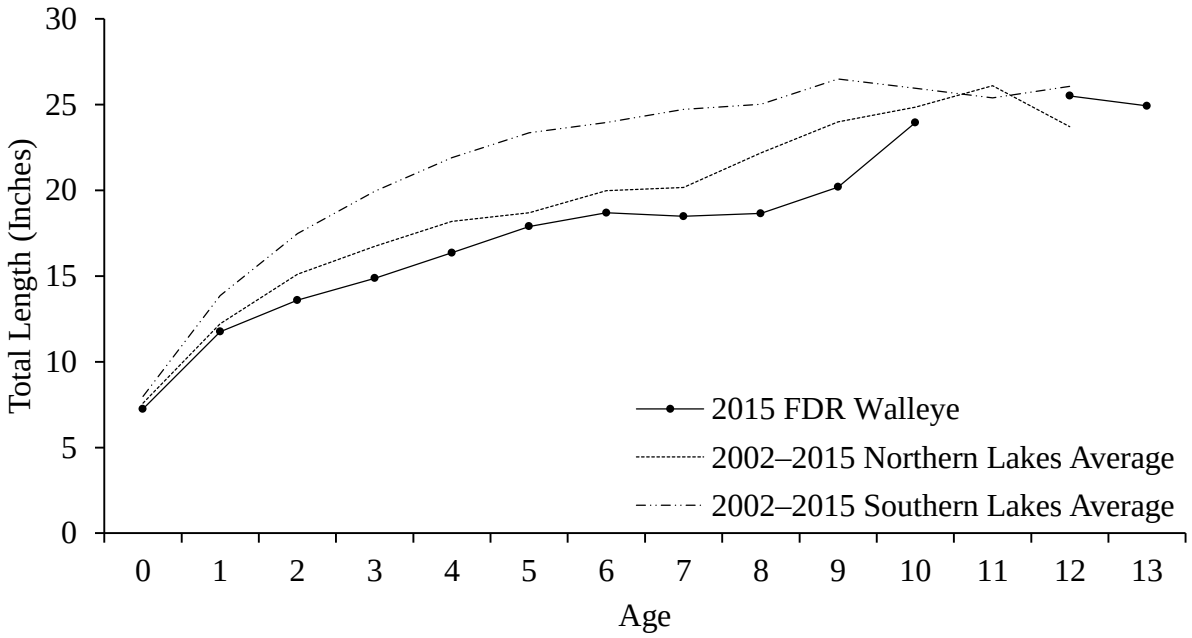

FIGURE 8. Average length-at-age of Walleye collected during FWIN on FDR in 2015 compared to the northern and southern lakes average from FWIN surveys conducted from 2002–2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Fish Community

In addition to Walleye, which was the most abundant species collected, 15 other fish species were collected during the 2015 FWIN survey on FDR, and anglers can expect to find diverse fishing opportunities (FIGURE 9). Lake Whitefish was second in abundance and represented 28% of the total catch followed by Smallmouth Bass (10%). The remaining species ranged from less than 1% to 8% of the total catch. Lake Whitefish are abundant in many of our lakes but this species is underutilized in Washington. This is likely a regional phenomenon but anglers should be aware that Lake Whitefish are a very popular food fish in the upper Midwestern United States since they make excellent table fare. Rainbow Trout fishing can be excellent, especially in winter, due to the cooperative net-pen rearing projects at numerous locations along the reservoir. The net-pen project stocks approximately 750,000 catchable sized Rainbow Trout annually into Lake Roosevelt. Check the latest regulations pamphlet for special trout rules. In addition, please visit http://www.wdfw.wa.gov/fishing/washington/ for informational videos on fishing FDR as well as other lakes throughout Washington.

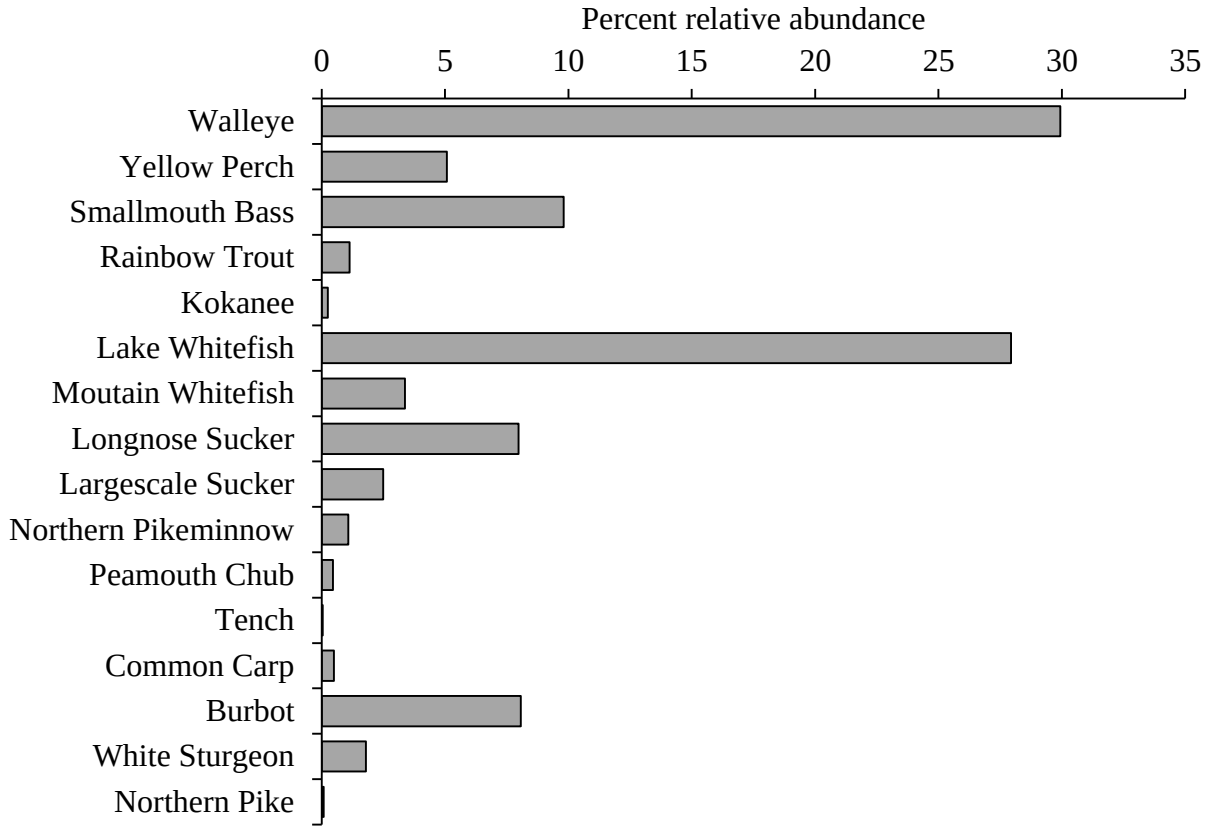

FIGURE 9. Percent relative abundance of the total number of fishes collected during FWIN on FDR in 2015.

Lake Roosevelt Recreational Opportunities

Lake Roosevelt is more than 150 miles in length, from Grand Coulee Dam to British Columbia, Canada. There are numerous access points along the 150 mile length of FDR on both sides. They are owned and operated by state, city, county and federal agencies, along with tribes and private businesses. There are both boat ramps and good shore angling opportunities. There are also numerous campgrounds, resorts and RV parking. The National Park Service operates 35 recreation areas along the 660 miles of shoreline. Maps are available at the Grand Coulee Dam visitor center and WDFW Spokane office. Water level fluctuations can be a problem for boat launching. For current water level information, call (800) 824–4916. For more information on Lake Roosevelt please visit http://www.wdfw.wa.gov/fishing/vacation/lake_roosevelt.html.

Banks Lake

Walleye Population Sampling

We conducted the 2015 Banks Lake FWIN survey October 11–15. A total of 48 FWIN nets were set throughout the lake and 312 Walleye were collected. The mean Walleye CPUE on Banks Lake was 6.5 fish per net (FIGURE 10). This is a slight decrease from 2014, yet is similar to what we found in 2013 and is well above the long-term average. We began to see an increase in Walleye abundance in 2011, which may have been due to the Banks Lake drawdown which concentrated fish. Since 2012, above average CPUE of Walleye has been due to a large year-class of Walleye that has represented 60–83% of our total catch.

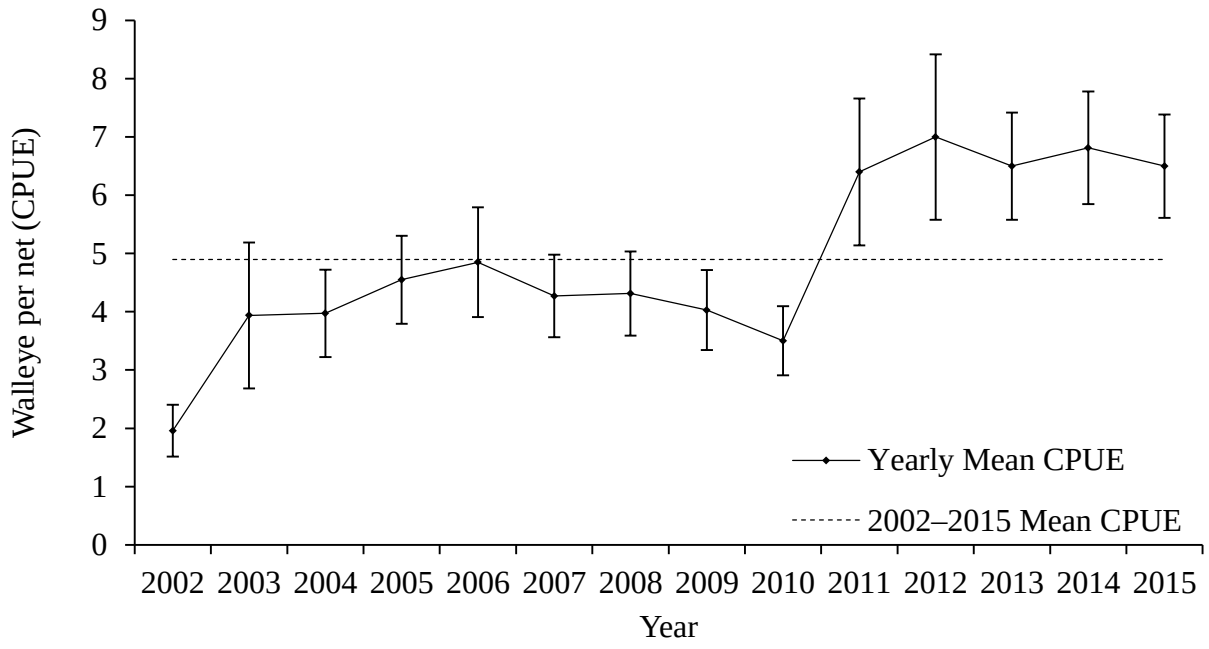

FIGURE 10. Yearly mean (± 80% CI) Walleye CPUE on Banks Lake from 2002–2015 compared to the long-term (2002–2015) mean CPUE.

Walleye collected during FWIN on Banks Lake averaged just over 15 inches in 2015. This was an increase from 2014 and slightly above the long-term average. Approximately 92% of the Walleye collected were between 12 and 20 inches (FIGURE 11). The increase in abundance of Walleye in the 16–20 inch range, which averaged 17 inches, indicates that more harvestable Walleye will be available for anglers in 2016.

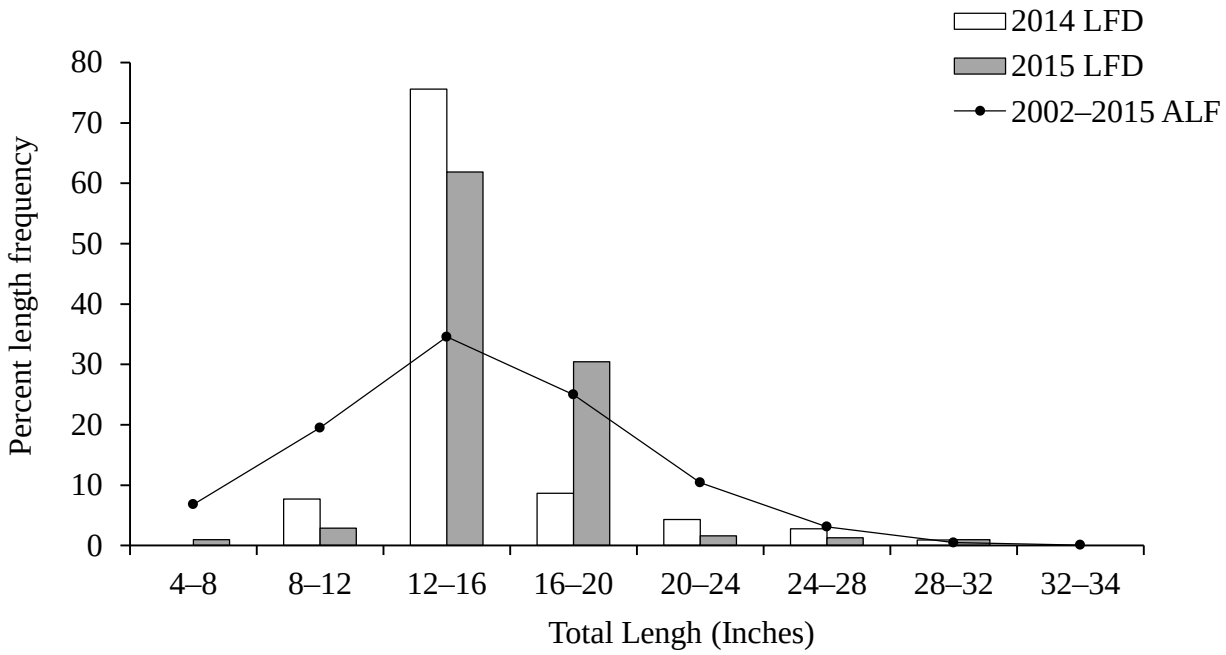

FIGURE 11. Percent length frequency distribution (LFD) of Walleye collected during FWIN on Banks Lake in 2015 compared to 2014 and the average length frequency (ALF) from all FWIN surveys on Banks Lake from 2002–2015.

A total of nine age-classes were collected during the 2015 Banks Lake FWIN survey, ranging from 0 to 13 years (FIGURE 12). Walleye aged 4, 8, 10, 11 and 12 were not collected and only 11 fish older than age–3 were collected. The age–3 year class represented 83% of the Walleye collected in 2015. This year class has been well represented in our samples since 2012, when these fish were age–0. The age–9 year class was just above the long-term average for relative abundance. These fish were hatched in 2006 and comprised the majority of Walleye collected during FWIN surveys from 2007–2010.

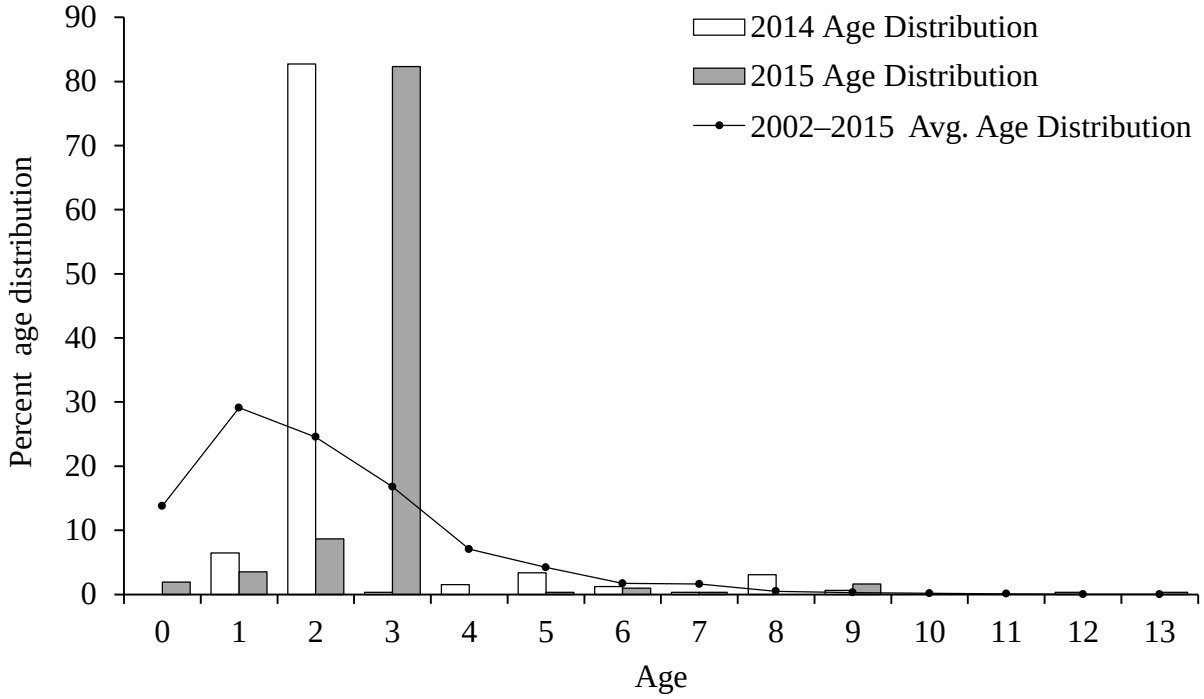

FIGURE 12. Percent age distribution of Walleye collected during FWIN on Banks Lake in 2015 compared to 2014 and the average age distribution from all FWIN surveys on Banks Lake from 2002–2015.

Of the 312 Walleye collected in Banks Lake a total of 100 (32%) were mature. Of these, only 12 were female and 88 were male. A small percentage of male Walleye were mature by fall as age–2 fish and 100% were mature by fall as age–6 fish (FIGURE 13). Approximately 4% of female Walleye were mature by fall as age–3 fish and 100% were mature by age–5. Two age–6 female Walleye were collected and one was immature. In 2014 we also collected two age–6 female Walleye; both of these were immature. Similar to FDR, Walleye in Banks Lake were slower to mature than in Potholes Reservoir or Moses Lake.

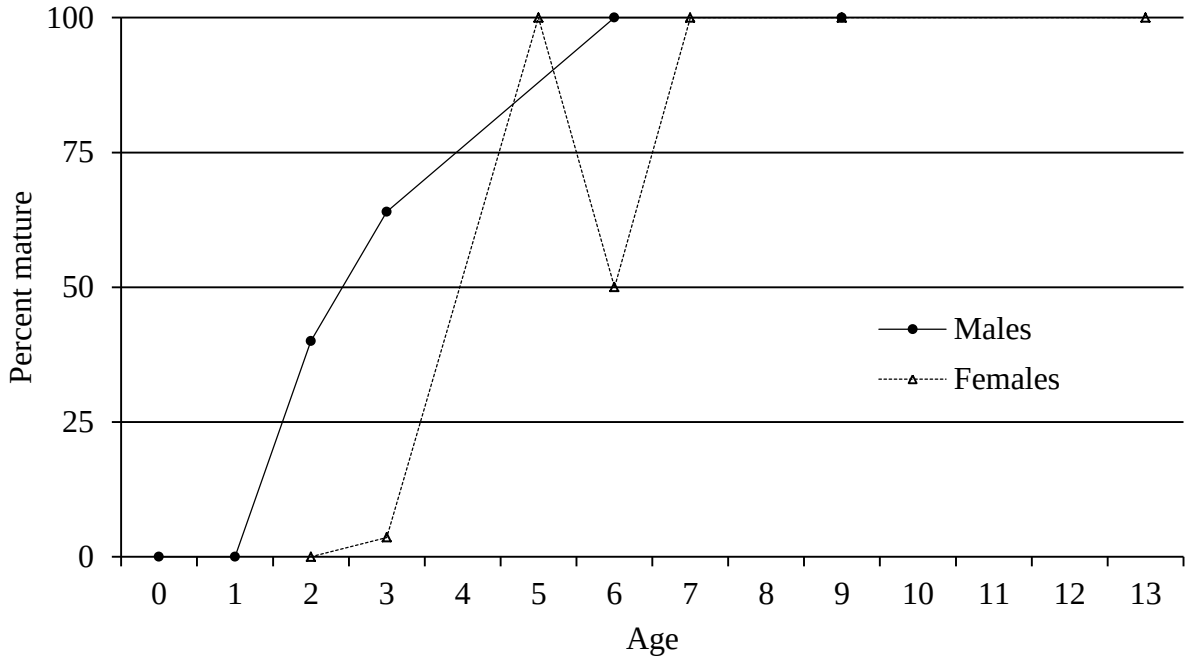

FIGURE 13. Percent of mature male and female Walleye at each age-class collected during FWIN on Banks Lake in 2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Length-at-age of Walleye collected from Banks Lake in 2015 was higher than the northern lakes average for most year-classes (FIGURE 14). As stated previously, only eight age-classes were collected and only 10 Walleye over age–3 were collected in 2015. Small samples of fish at these age-classes created inconsistent length-at-age trends that made comparisons with long-term regional averages difficult.

FIGURE 14. Average length-at-age of Walleye collected during FWIN on Banks Lake in 2015 compared to the northern and southern lakes average determined from FWIN surveys conducted from 2002–2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Fish Community

In addition to Walleye, which was third in abundance, 13 other fish species were collected during our 2015 FWIN survey on Banks Lake (FIGURE 15). Yellow Perch was the most abundant species collected and represented 36% of the total catch in 2015. This is an increase from 2014 but is similar to what we found in 2013. The relative abundance of Lake Whitefish decreased from 2014; however, it is similar to what we found in 2013. Our overall catch of Yellow Perch nearly doubled from 2014; however, average size declined from 8 inches to 5 ½ inches. Remaining species ranged in abundance from 0.1–10% of the total catch.

Despite removal efforts by WDFW and increased popularity of this fishery Lake Whitefish remain abundant in Banks Lake. The number of Lake Whitefish collected during FWIN on Banks Lake in 2015 (n = 434) declined somewhat from 2014 (n = 574), but this population continues to thrive and contains plenty of large fish, (18.6 inches and 2.4 lbs. on average).

We encourage anglers to seek out, and harvest, Lake Whitefish. Similar to FDR, Banks Lake is an important Smallmouth, and Largemouth Bass fishery hosting several bass tournaments each year. Banks Lake also contains very good opportunities for Yellow Perch, Rainbow Trout, Black Crappie and Kokanee. A Rainbow Trout net-pen rearing project in Coulee City helps provide excellent fishing for Rainbow Trout up to 5 pounds. Kokanee fishing can also be excellent on Banks Lake as approximately 1 million Kokanee have been stocked annually in recent years.

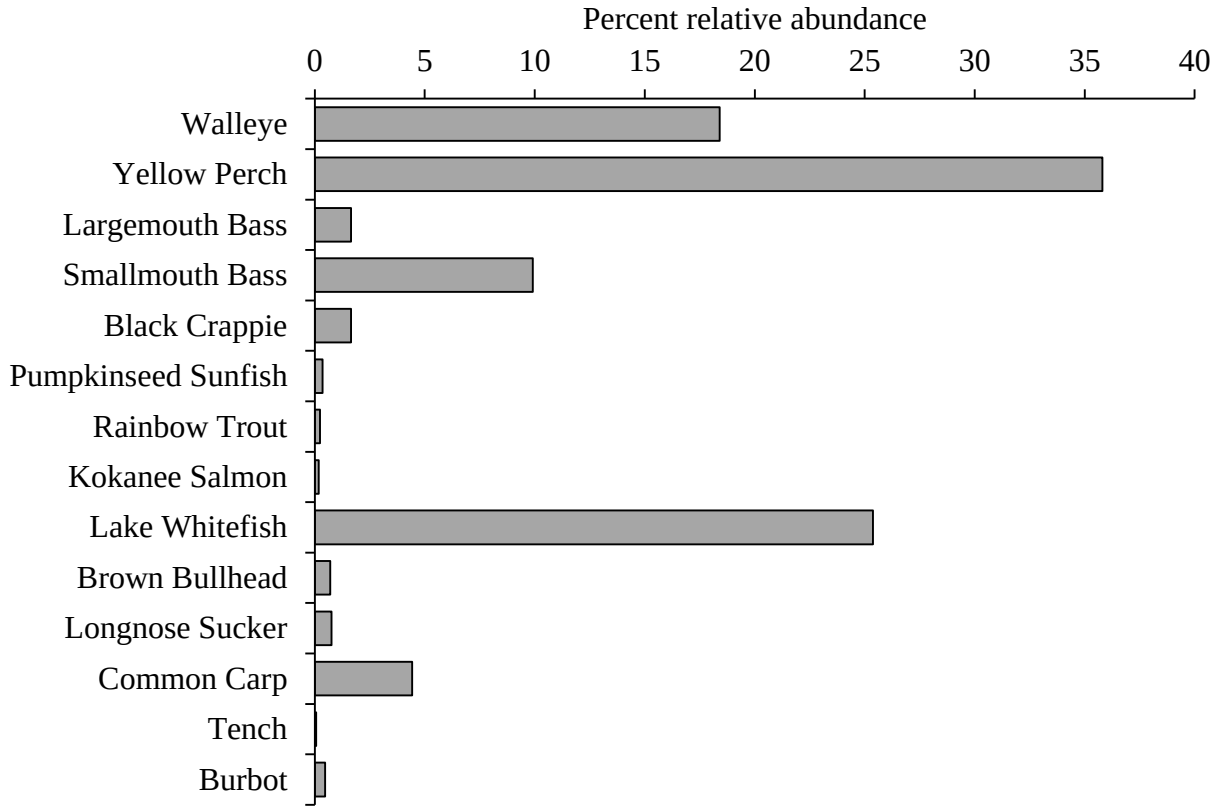

FIGURE 15. Percent relative abundance of the total number of fishes collected during FWIN on Banks Lake in 2015.

Banks Lake Recreational Opportunities

Banks Lake stretches almost 27 miles from Coulee City at the south end to Grand Coulee at the north end and has numerous access points for launching boats and shore angling. Restaurants, lodging as well as city-owned parks (some with water access) can be found in Coulee City, Electric City and Grand Coulee. Steamboat Rock State Park offers camping, trailer and RV hook-ups, well maintained boat ramps, shore angling and it surrounds the "Devil's Punch Bowl", which has very good Largemouth Bass and Black Crappie habitat.

Moses Lake

Walleye Population Sampling

We conducted the 2015 Moses Lake FWIN survey October 18–20. A total of 13 FWIN nets were set throughout the lake and 374 Walleye were collected. The mean Walleye CPUE on Moses Lake was 28.7 fish per net (FIGURE 16). This is a significant decline from 2014; however, the high CPUE of 2014 was due to above average catches of age–0 Walleye, which was the result of an incredibly strong year class.

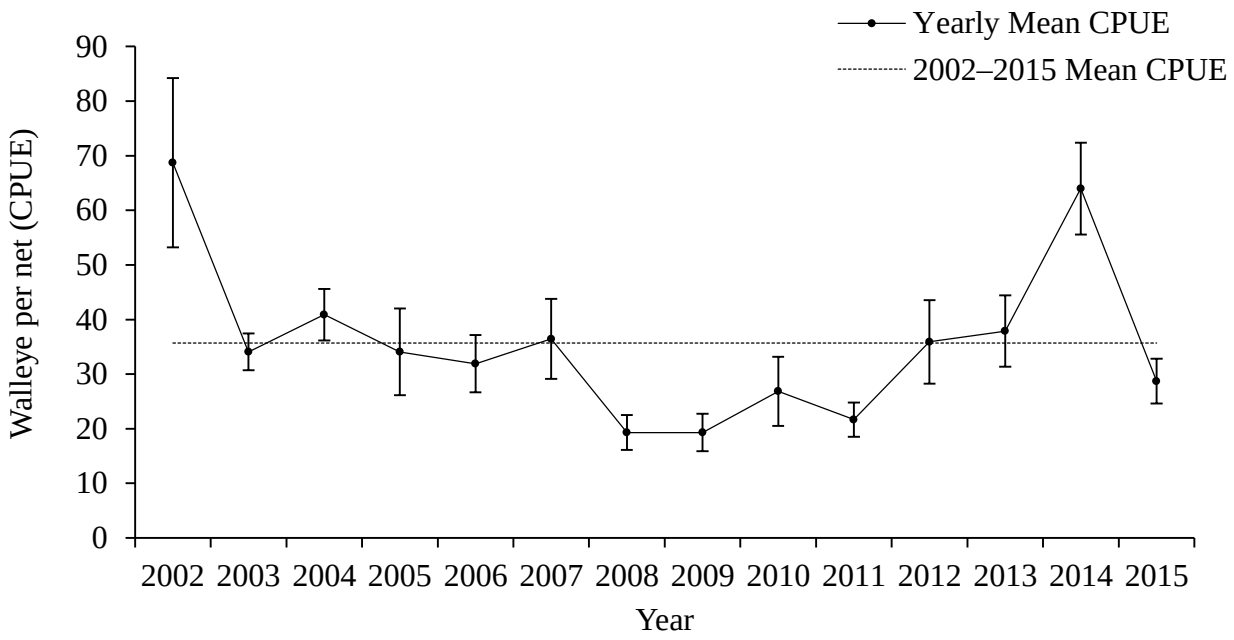

FIGURE 16. Yearly mean (± 80% CI) Walleye CPUE on Moses Lake from 2002–2015 compared to the long-term (2002–2015) mean CPUE.

Walleye collected during FWIN on Moses Lake averaged 16.5 inches in 2015. This is an increase from 2014 (14 inches) and just above the long-term average (16 inches). Approximately 67% of the Walleye collected in 2015 were at least 16 inches (FIGURE 17) and 29% were at least 20 inches. Anglers should find a higher percentage of Walleye greater than 16 inches on Moses Lake in 2016. Despite declines in their relative abundance we saw good production of age–0 Walleye in 2015 and we feel that this population should continue to produce a good stock of harvestable fish.

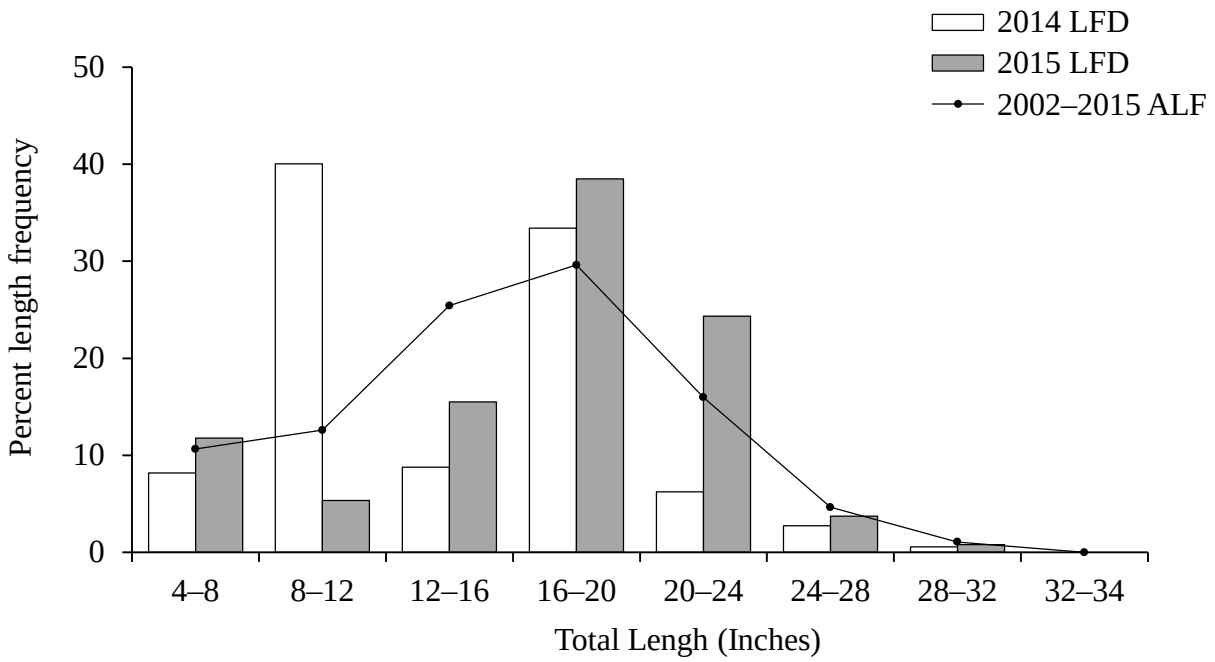

FIGURE 17. Percent length frequency distribution (LFD) of Walleye collected during FWIN on Moses Lake in 2015 compared to 2014 and the average length frequency (ALF) from all FWIN surveys on Moses Lake from 2002–2015.

A total of 12 age-classes were collected during the 2015 Moses Lake FWIN survey, with fish ranging from 0 to 15 years (FIGURE 18). Walleye aged 5, 10, 12, and 14 were not collected. The age–1 and 3 year-classes were the most abundant collected (FIGURE 18) and averaged 16 and 20 inches, respectively. The age–6 year-class was also above the long-term average and has been consistently strong since these fish were age–0 (in 2009). Age–1 and 3 Walleye will likely provide the majority of the catch for anglers in 2016.

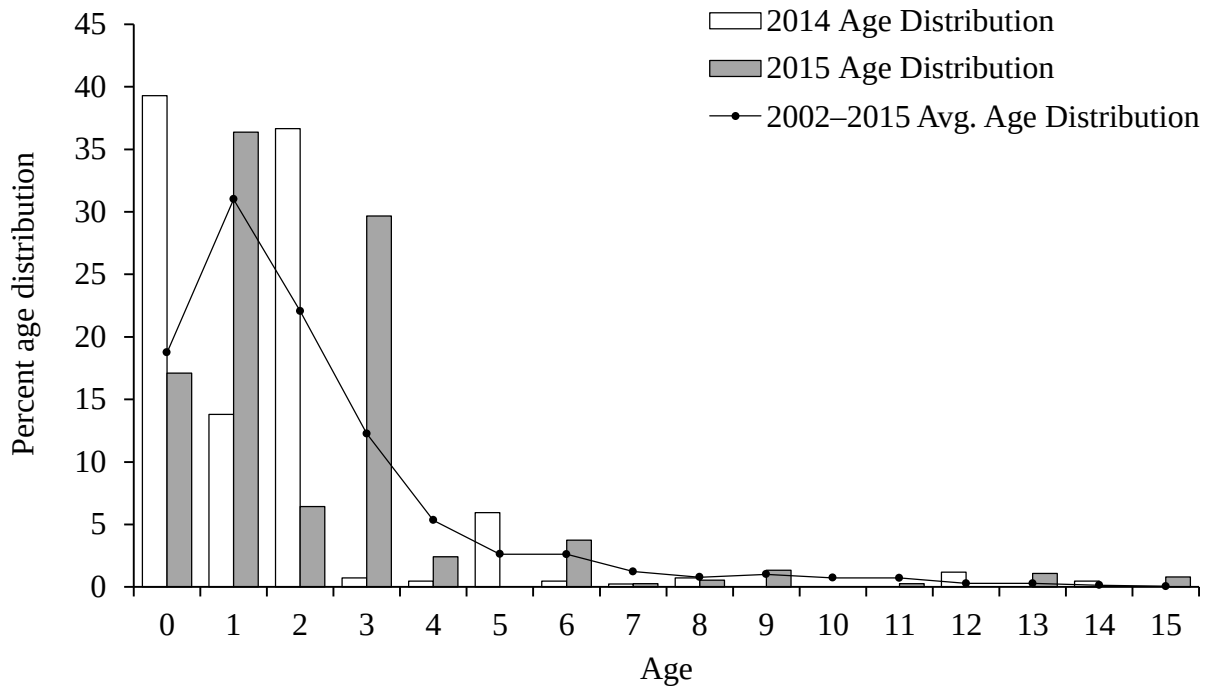

FIGURE 18. Percent age distribution of Walleye collected during FWIN on Moses Lake in 2015 compared to 2014 and the average age distribution from all FWIN surveys on Moses Lake from 2002–2015.

Of the 374 Walleye collected in Moses Lake a total of 223 (60%) were mature. Of these, 68 were female and 155 were male. Male Walleye began to mature by fall as age–1 fish and reached 100% maturity by fall as age–2 (FIGURE 19). A smaller percentage of female Walleye were mature by fall as age–1 fish; however, by fall as age–4 100% of female were mature as well (FIGURE 19). Walleye in this population mature quickly and this likely contributes to consistently productive year classes of Walleye we see regularly.

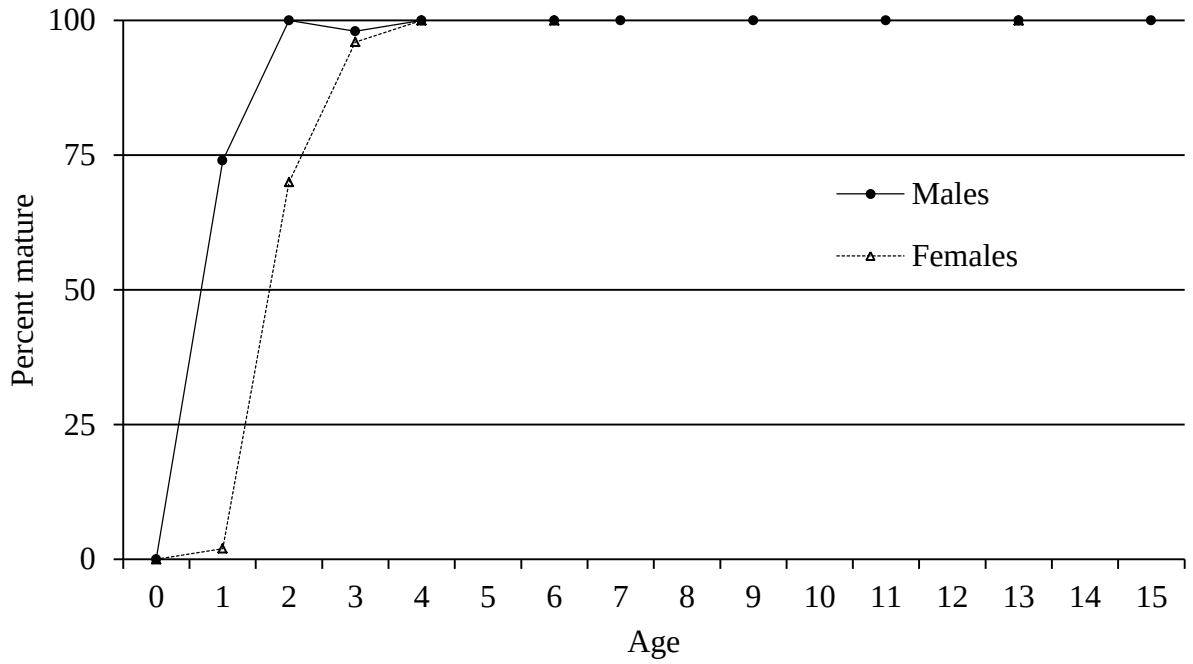

FIGURE 19. Percent of mature male and female Walleye at each age-class collected during FWIN on Moses Lake in 2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Length-at-age of Walleye collected in Moses Lake was above the southern lakes average for fish age–1, 2, 8 and 13. From age–0 to 6 we found a consistent increasing trend in length-at-age. Past age–6 there was no consistent trend in length-at-age (FIGURE 20). Only 16 Walleye were collected beyond age–6. Collecting very few fish in an age-class prevents us from making precise estimates of average length-at-age and length-at-age estimates for Walleye older than age–6 should be viewed with caution. Overall, Walleye in Moses Lake exhibited fast growth, with most fish reaching 16–21 inches by fall as age–2. These growth rates were a good indication of abundant forage on Moses Lake and that Walleye will recruit to the sport fishery more quickly than on less productive waters such as FDR and Banks Lake.

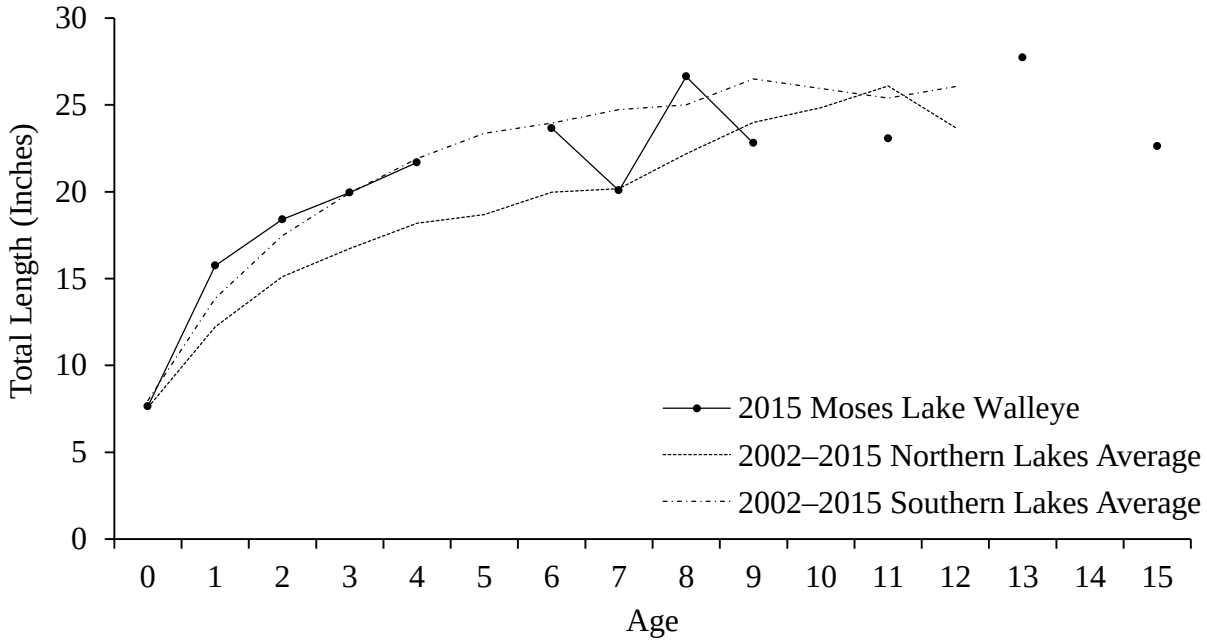

FIGURE 20. Average length-at-age of Walleye collected during FWIN on Moses Lake in 2015 compared to the southern and northern lakes average determined from FWIN surveys conducted from 2002–2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Fish Community

In addition to Walleye, 11 other fish species were collected during this survey (FIGURE 21). Yellow Perch was the most abundant species collected; however, relative abundance of decreased slightly from 2014. In addition, the average size of Yellow Perch decreased compared to 2014. In 2014, approximately 50% of the Yellow Perch collected were at least 10 inches and nearly 5% were at least 12 inches. In 2015, only 15% were at least ten inches and 3% were at least 12 inches. Black Crappie ranked third in relative abundance; however, 98% of those collected were less than six inches. Historically, Moses Lake has been a popular Walleye and Smallmouth Bass fishery; however, in recent years it has become a well-respected Largemouth Bass fishery with anglers reporting catches of Largemouth Bass weighing 8–10 pounds. Perch fishing can be quite good on Moses Lake, especially during winter near Blue Heron Park. Some anglers also target Common Carp with both hook and line or bow and arrow.

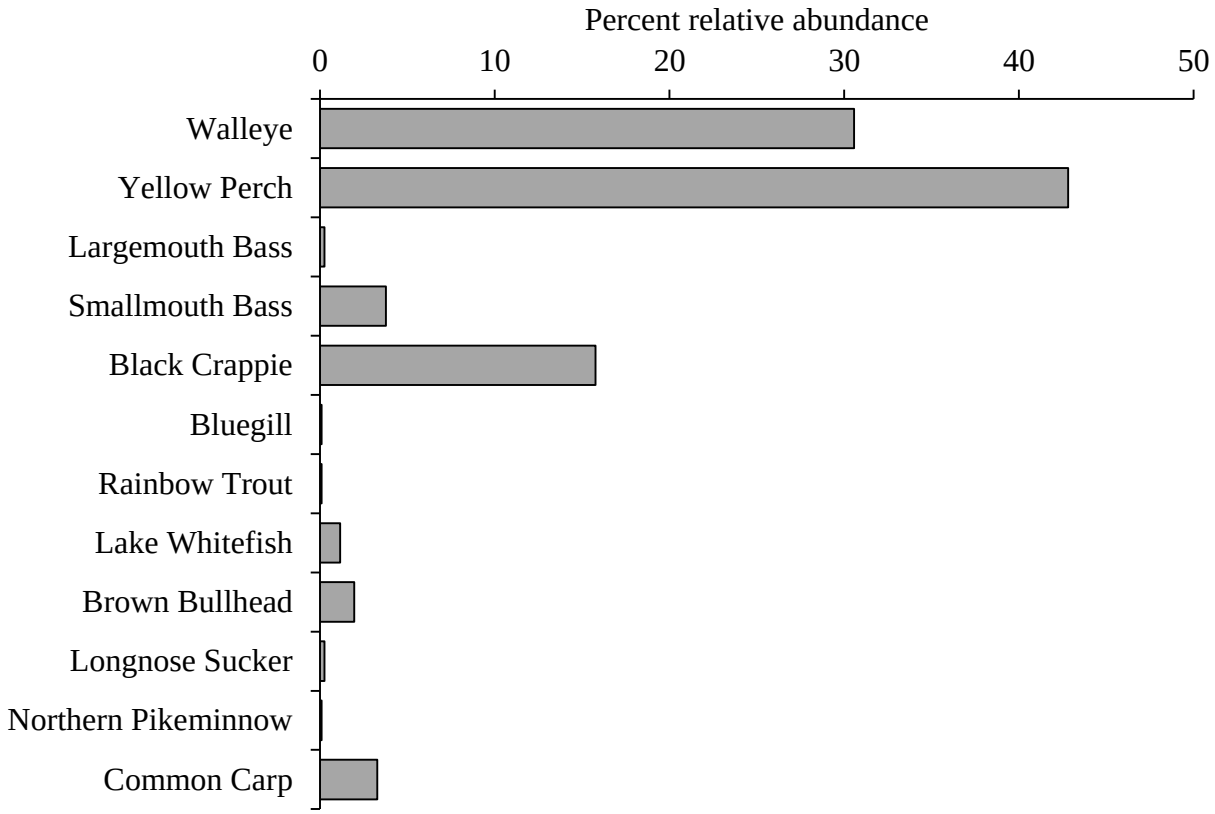

FIGURE 21. Percent relative abundance of the total number of fishes collected during FWIN on Moses Lake in 2015.

Moses Lake Recreational Opportunities

There are six improved public boat launches on Moses Lake and one gravel launch at the north end of the lake. The City of Moses Lake offers lodging and two city-owned parks with boat ramps and docks. In addition to water access these parks offer grass day-use areas with picnic tables. Cascade Park also has camping facilities and boat moorage. An annual "Fishing Kids" derby, held at Cascade Park in early summer introduces youth ages 5–14 to sport fishing.

Potholes Reservoir

Walleye Population Sampling

We conducted the 2015 Potholes Reservoir FWIN survey October 21–23. A total of 16 FWIN nets were set throughout the reservoir and 354 Walleye were collected. The mean Walleye CPUE on Potholes Reservoir was 22 fish per net (FIGURE 22). This is a decline from 2014. Similar to Moses Lake; however, the high CPUE of 2014 was due to high production of age–0 Walleye. In 2014, 43% of the Walleye collected were age–0 fish. This was the highest percentage of age–0 Walleye collected on Potholes since FWIN began in 2002. Despite the decline in CPUE in 2015 it was still near the long-term average.

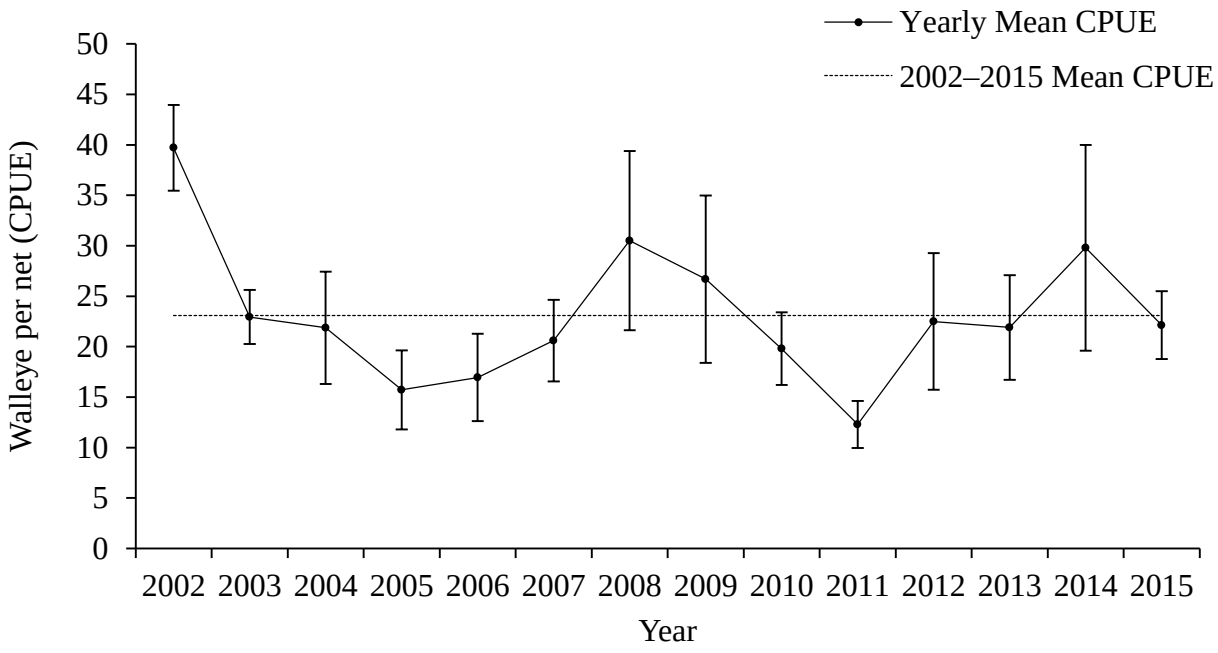

FIGURE 22. Yearly mean (± 80% CI) Walleye CPUE on Potholes Reservoir from 2002–2015 compared to the long-term (2002–2015) mean CPUE.

Walleye collected during FWIN on Potholes Reservoir averaged just over 16 inches in 2015. This is higher than the 2014 average length (15 inches) and equal with the long-term average. Walleye in the 12–16 inch range represented 46% of the Walleye collected (FIGURE 23). This group averaged 15 inches and should grow to 17–19 inches in 2016. Walleye in the 16–20 inch range increased slightly in relative abundance from 2014. Walleye above 16 inches declined slightly from 48% to 44%. Despite this slight decline there should still be plenty of opportunity for anglers to seek out and fish for large Walleye on Potholes Reservoir in 2016.

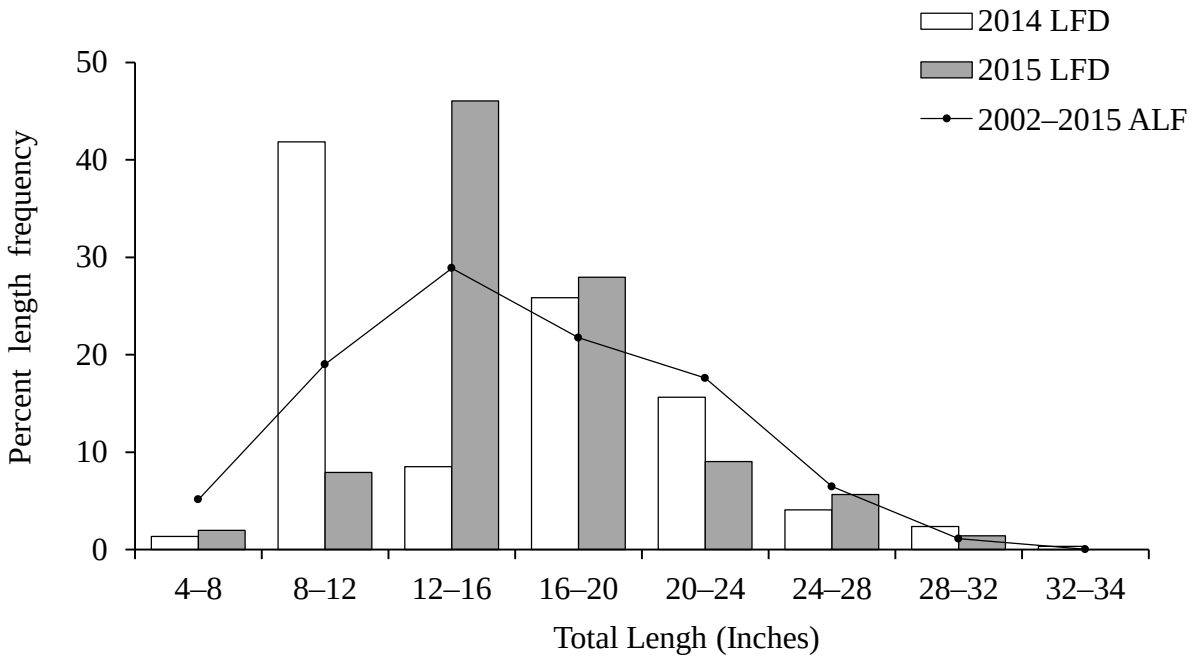

FIGURE 23. Percent length frequency distribution (LFD) of Walleye collected during FWIN on Potholes Reservoir in 2015 compared to 2014 and the average length frequency (ALF) from all FWIN surveys on Potholes Reservoir from 2002–2015.

A total of 13 age-classes were collected during the 2015 Potholes FWIN survey, ranging from 0 to 15 years. Walleye aged 11, 13 and 14 were not collected. The age–1 year-class was the most abundant collected, accounting for 64% of the total Walleye collected (FIGURE 24). This was well above the long-term average and was the result of a very big 2014 production year. Age–0 and 2 Walleye declined noticeably in both relative and actual abundance compared with 2014.

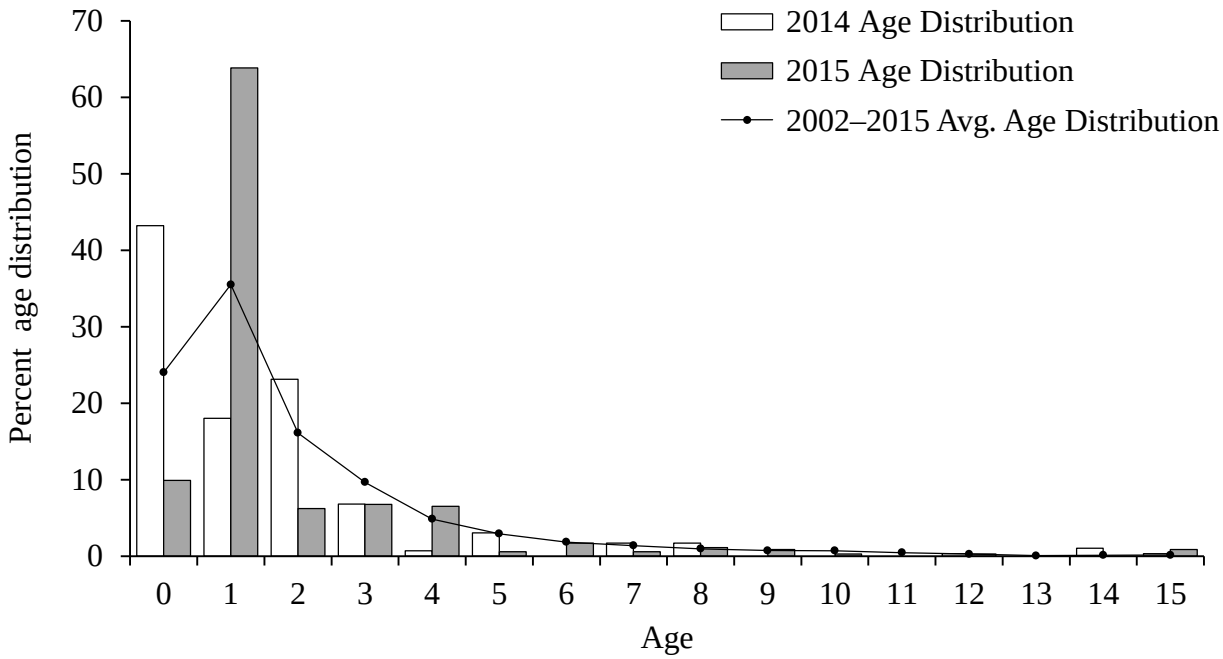

FIGURE 24. Percent age distribution of Walleye collected during FWIN on Potholes Reservoir in 2015 compared to 2014 and the average age distribution from all FWIN surveys on Potholes Reservoir from 2002–2015.

Of the 354 Walleye collected in Potholes Reservoir a total of 148 (42%) were mature. Of these, 40 were female and 108 were male. By fall as age–2, 100% of male Walleye collected were mature; however, two age–4 male Walleye were immature (Figure 25). Female Walleye were somewhat slower to mature reaching 100% maturity by fall as age–5. Similar to Moses Lake, Walleye in Potholes Reservoir mature quickly and this population does not suffer as much due to the effects of weak year classes.

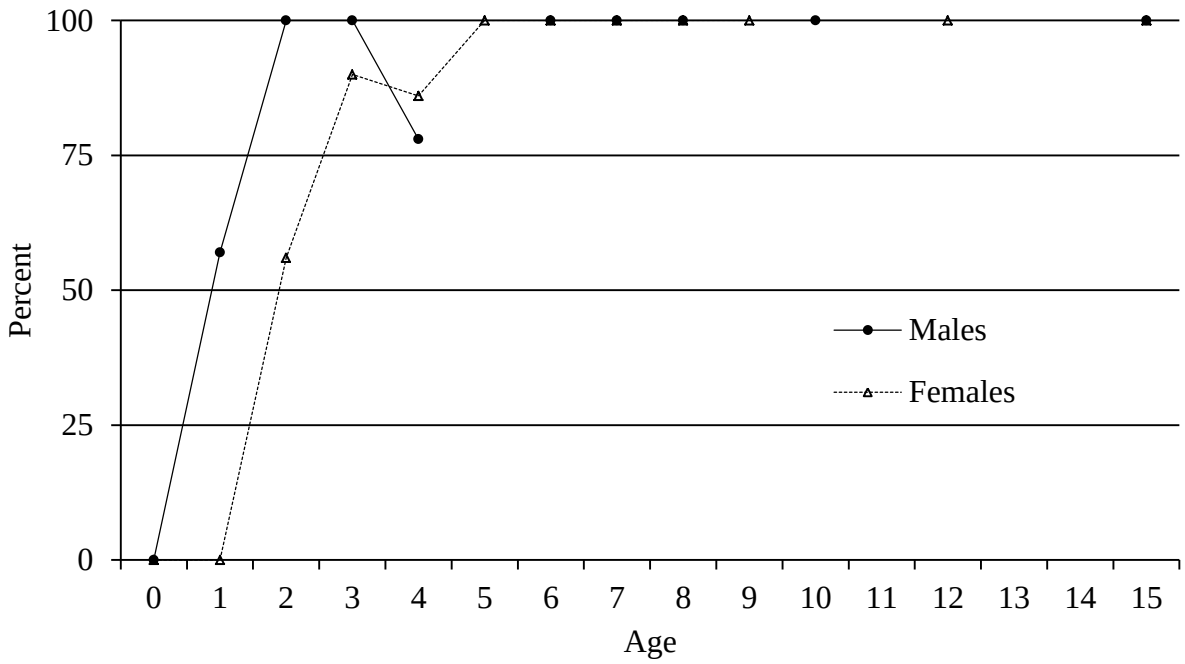

FIGURE 25. Percent of mature male and female Walleye at each age-class collected during FWIN on Potholes Reservoir in 2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Length-at-age of Walleye collected in Potholes Reservoir was above the southern lakes average for most age classes (FIGURE 26). Beyond age–4 the trend in length-at-age became more erratic, which corresponded to small samples of fish (22 Walleye) beyond this point. Potholes Reservoir Walleye have the fastest growth rate of all our FWIN waters, reaching 15 inches, on average, by fall as age–1 and over 19 inches, on average, by fall as age–2. Anglers should continue to find excellent opportunities to catch Walleye on Potholes Reservoir in 2016.

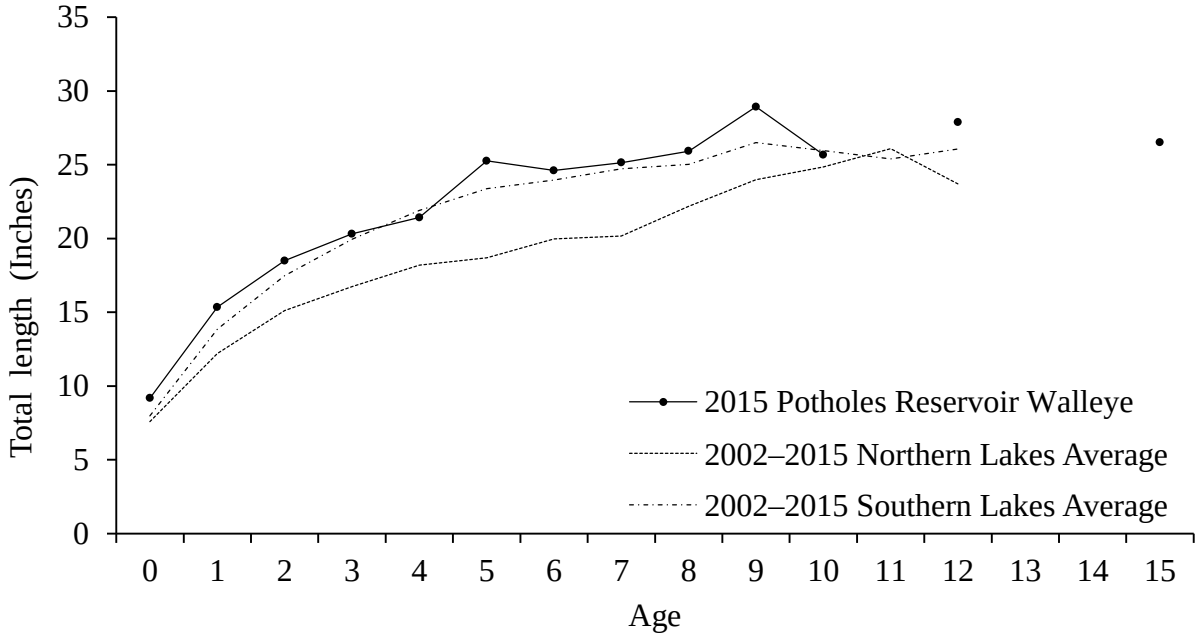

FIGURE 26. Average length-at-age of Walleye collected during FWIN on Potholes Reservoir in 2015 compared to the northern and southern lakes average from FWIN surveys conducted from 2002–2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Fish Community

In addition to Walleye, 13 other fish species were collected during the 2015 FWIN survey on Potholes Reservoir (FIGURE 27). Yellow Perch was second in abundance and represented 19% of the fish collected. This is a decline from the previous three years (32%, 52% and 65%, respectively) and represents an overall decline in Yellow Perch abundance in our samples, not simply a decline in relative abundance. Corresponding to this decline average size of Yellow Perch increased to 11 inches in 2015.

With the exception of Yellow Perch and Walleye relatively few other fish were collected during our 2015 FWIN survey of Potholes Reservoir and none represented more than 7% of the total catch (FIGURE 27).

While Potholes Reservoir is widely recognized as a world class Walleye fishery it is also one of the most popular bass fisheries (Smallmouth and Largemouth) in Washington. Smallmouth Bass fishing can be very good along the face of O'Sullivan Dam and in Lind Coulee. Excellent Largemouth Bass fishing can be found in the sand dunes at the north end of the reservoir. Black Crappie fishing is popular in the sand dunes of Potholes Reservoir as well as along the docks at Mardon Resort.

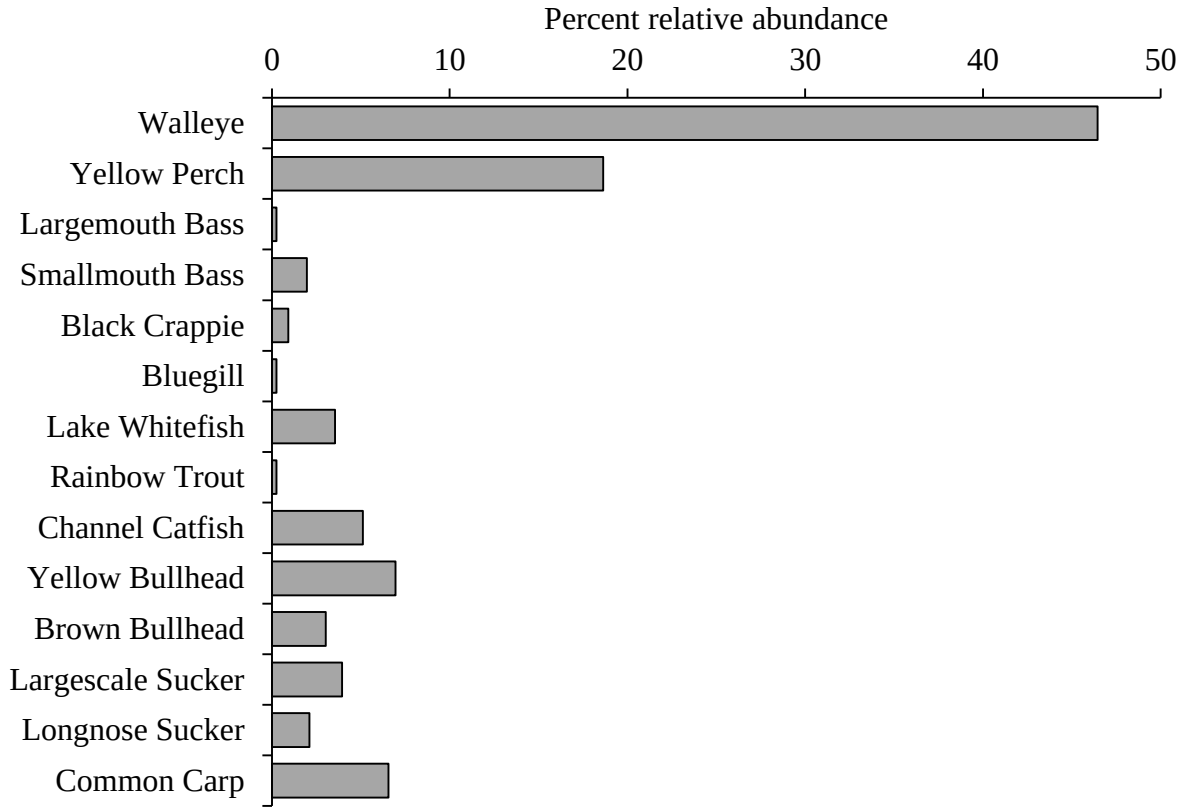

FIGURE 27. Percent relative abundance of the total number of fishes collected during FWIN on Potholes Reservoir in 2015.

Potholes Reservoir Recreational Opportunities

Potholes Reservoir is the home of Potholes State Park and Mardon Resort. Both offer water access for boat launching and shore fishing, as well as camping and RV hook-ups. Mardon Resort also offers cabin rental and a store that sells a wide variety of fishing supplies and licenses. Both facilities are in close proximity to the desert lakes and chain lakes directly adjacent to the south side of Potholes Reservoir where anglers can find numerous opportunities for Walleye and bass fishing as well as trout and panfish. Those lakes are relatively small and offer very good shore access for fishing.

Scooteney Reservoir

Walleye Population Sampling

We conducted the 2015 Scooteney Reservoir FWIN survey October 19–20. A total of 11 FWIN nets were set throughout the reservoir and 434 Walleye were collected. The mean Walleye CPUE on Scooteney Reservoir was 39.5 fish per net (FIGURE 28). This is the highest Walleye CPUE recorded on Scooteney Reservoir and is primarily due to the abundance of age–1 Walleye, which represented approximately 74% of the Walleye collected. In 2014, the age–0 year class represented 32% of the Walleye collected and it appears as though this year class has remained strong.

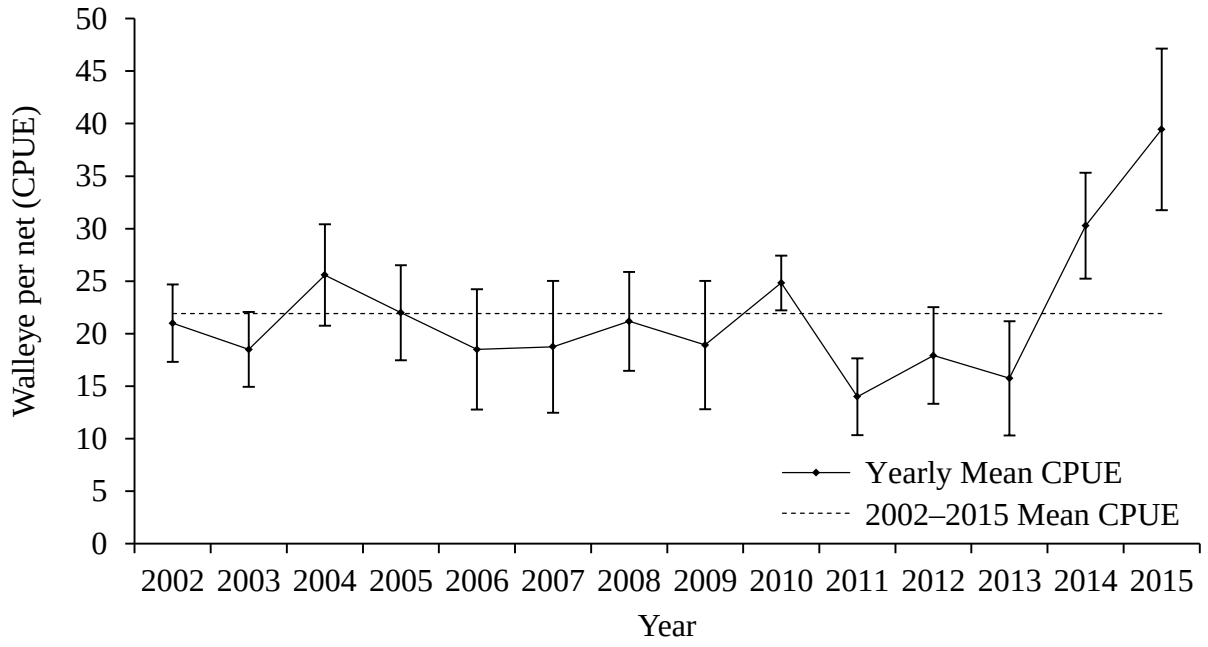

FIGURE 28. Yearly mean (± 80% CI) Walleye CPUE on Scooteney Reservoir from 2002–2015 compared to the long-term (2002–2015) mean CPUE.

Walleye from Scooteney Reservoir averaged 14.5 inches in 2015. This is a slight increase from 2014 and the long-term average. The majority of Walleye collected was in the 12–16 inch range (FIGURE 29) and were primarily age–1 fish. This size range was above the 2014 and the long–term average and was the only size range that increased in relative abundance. While there were proportionally fewer large Walleye collected in 2015, the number of Walleye at least 16 inches collected was the highest we've recorded since 2002. Anglers should continue to find plenty of larger Walleye in this population.

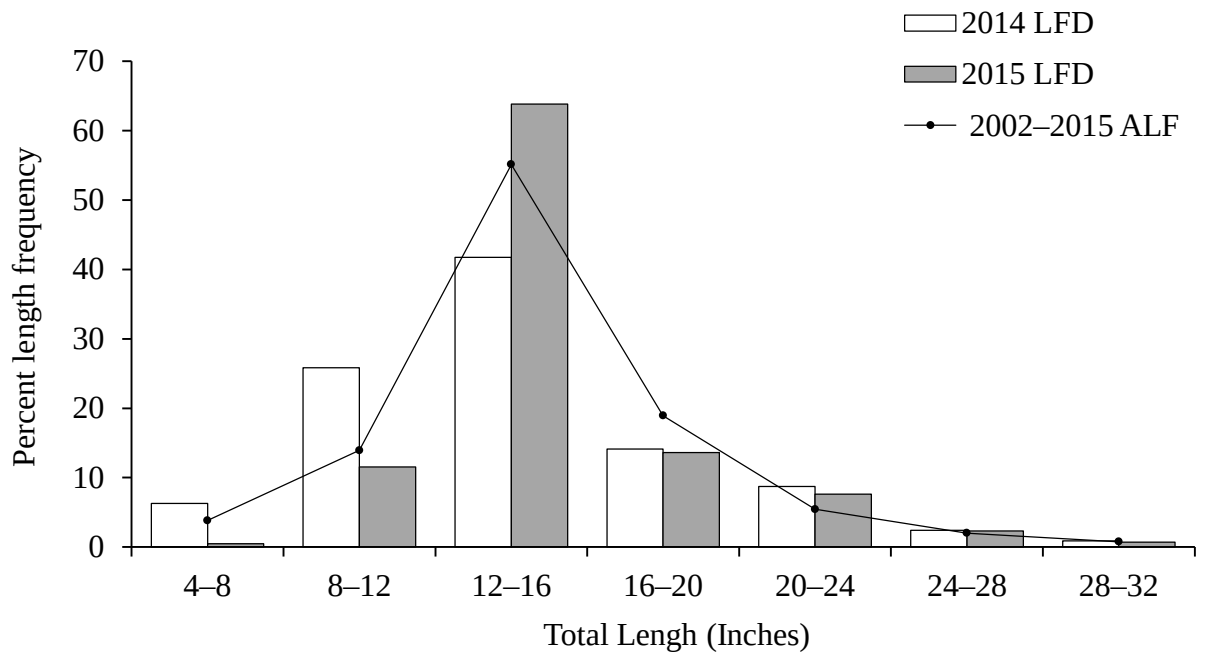

FIGURE 29. Percent length frequency distribution (LFD) of Walleye collected during FWIN on Scooteney Reservoir in 2015 compared to 2014 and the average length frequency (ALF) from all FWIN surveys on Scooteney Reservoir from 2002–2015.

A total of 11 age-classes were collected during the 2015 Scooteney Reservoir FWIN survey, ranging from 0 to 12 years (FIGURE 30). Walleye aged 7 and 8 were not collected. The age–1 year-class was the most abundant collected and was well above the long-term average in terms of relative abundance (FIGURE 30). Very few Walleye older than age–3 were collected in 2015; however, we typically don't collect many Walleye older than age–3 on Scooteney Reservoir. The average (2002–2015) percentage of Walleye collected older than age–3 on Scooteney Reservoir is 6%, while that of the remaining 4 FWIN lakes is 15%. In 2015, approximately 5% (n=12) of the Walleye collected were older than age–3.

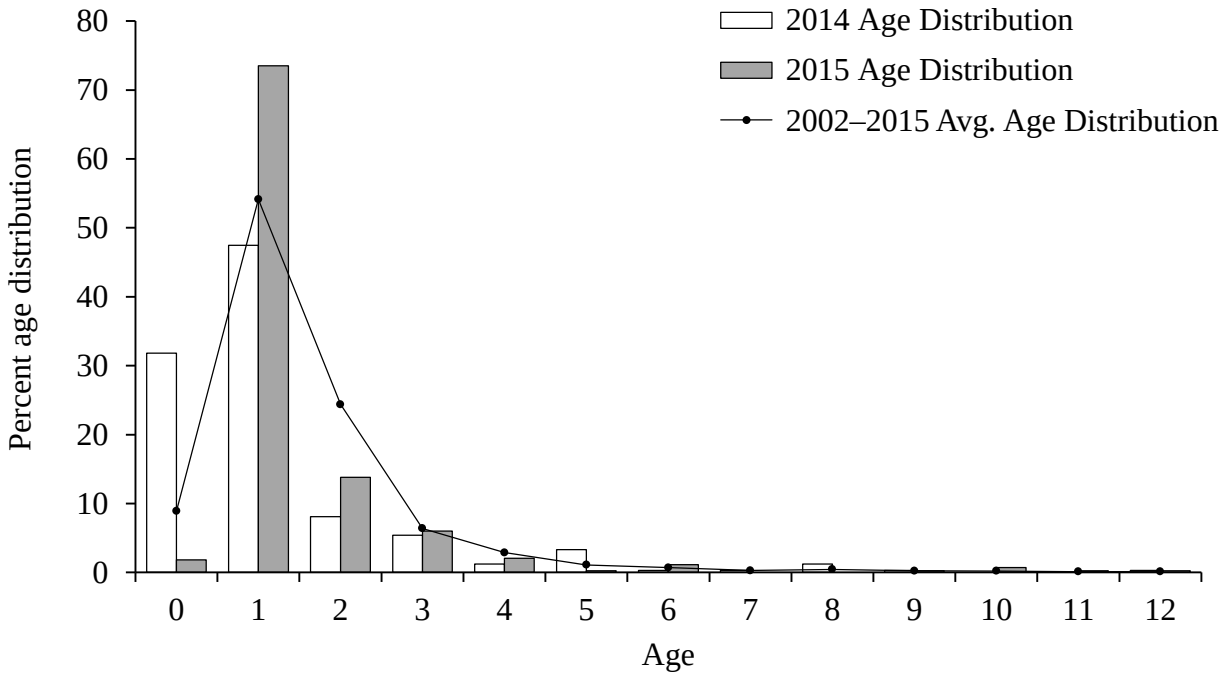

FIGURE 30. Percent age distribution of Walleye collected during FWIN on Scooteney Reservoir in 2015 compared to 2014 and the average age distribution from all FWIN surveys on Scooteney Reservoir from 2002–2015.

Of the 434 Walleye collected in Scooteney Reservoir only 49 (11%) were mature. Of these, 18 were female and 31 were male. A small percentage of male Walleye began to mature in fall as age–1 fish and by age–4 100 % were mature (FIGURE 31). A small percentage of female Walleye began to mature at age–3 and by fall at age–4 approximately 74% were mature. Female Walleye reached 100% maturity by fall as age–6 fish.

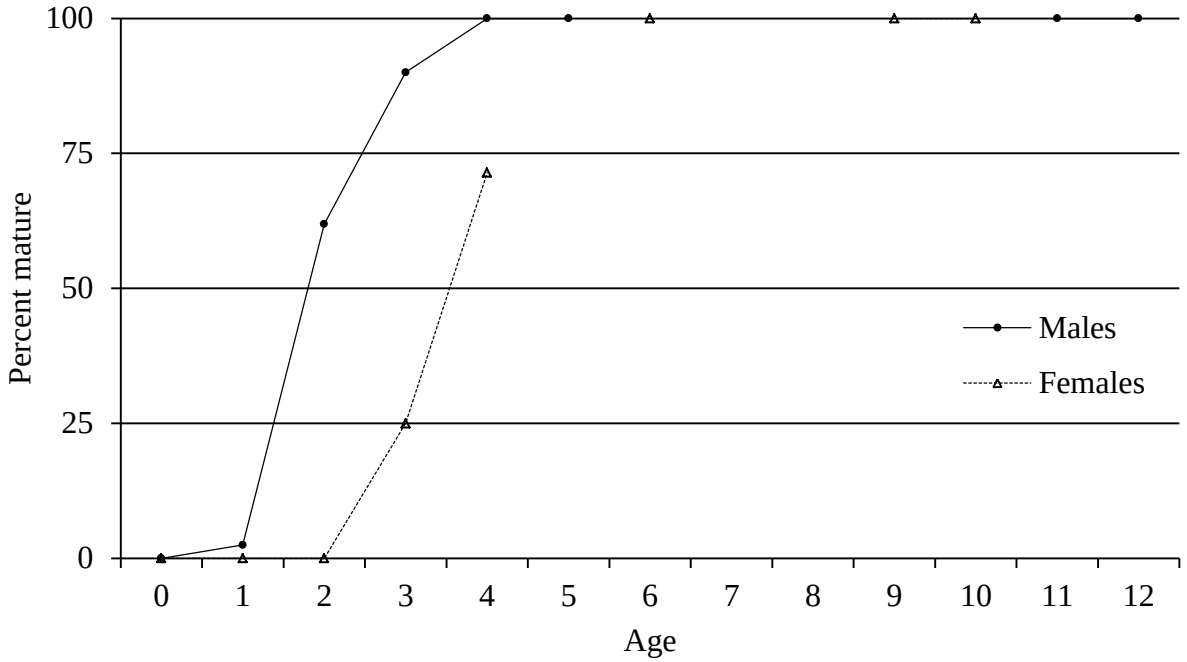

FIGURE 31. Percent of mature male and female Walleye at each age-class collected during FWIN on Scooteney Reservoir in 2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Length-at-age of Walleye in Scooteney Reservoir was near the southern lakes average for fish out to age–4 (FIGURE 32). Walleye reached 13 inches by fall as age–1 fish and 18 inches by fall as age–2. Only 12 fish were collected older than age–4. One age–5 Walleye was collected and it was below average for length-at-age. No age–7 or 8 Walleye were collected and Walleye older than age–9 showed a declining trend in length-at-age.

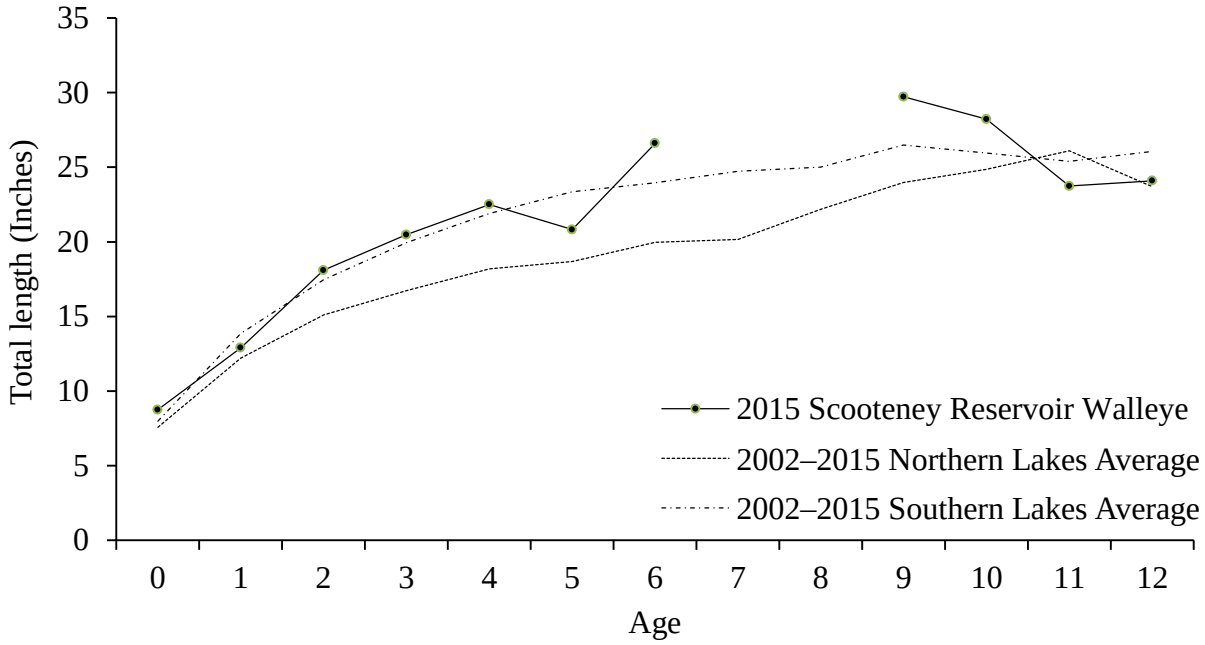

FIGURE 32. Average length-at-age of Walleye collected during FWIN on Scooteney Reservoir in 2015 compared to the northern and southern lakes average from FWIN surveys conducted from 2002–2015. Breaks in data point continuity indicate missing Walleye at that age-class.

Fish Community

In addition to Walleye, which was the most abundant species collected, 13 other fish species were collected during the 2015 FWIN survey on Scooteney Reservoir (FIGURE 33). Yellow Perch was second in abundance and represented 22% of the fish collected. Yellow Perch declined in overall abundance from 2014 and average size increased slightly in 2015. The percentage of Yellow Perch at least 8 inches decreased from 55% in 2014 to 26% in 2015. Of the remaining 11 species collected none represented more than 6% of the total catch. However, angling opportunities for the other species can be very good.

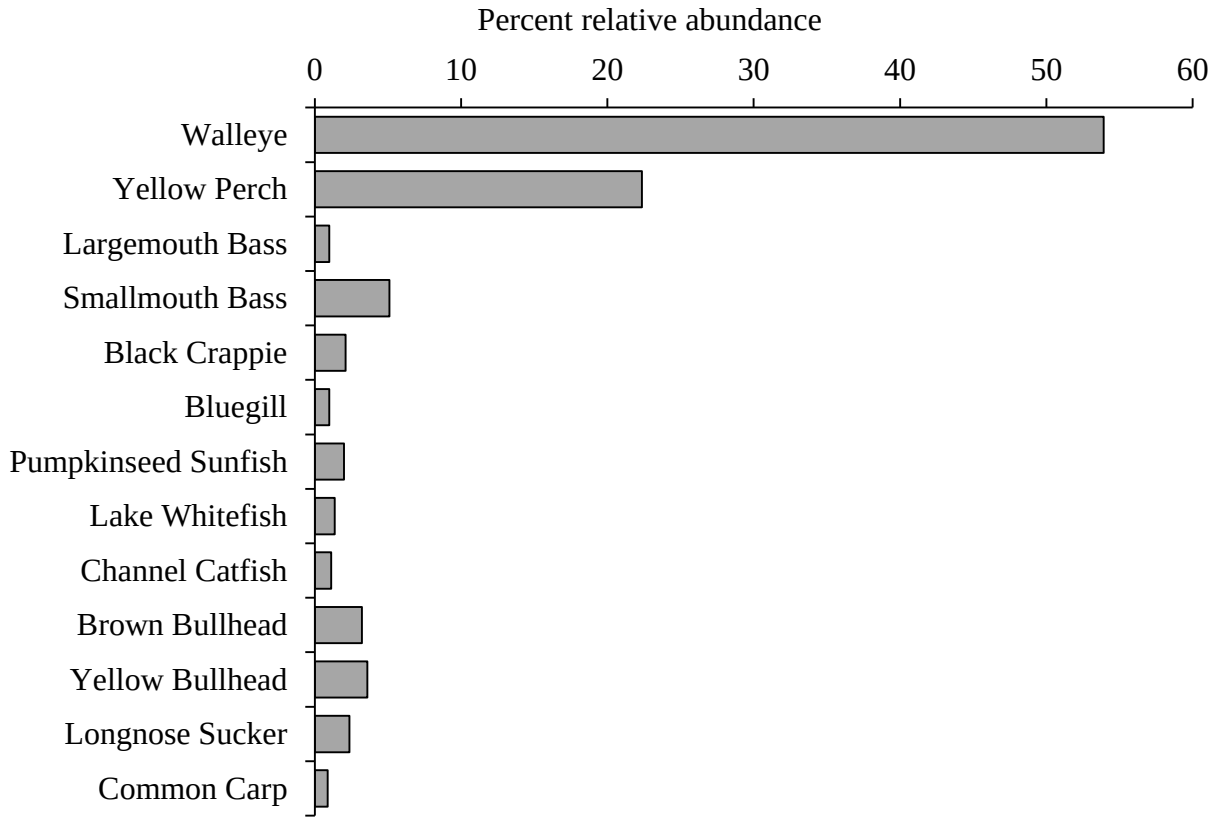

FIGURE 33. Percent relative abundance of the total number of fishes collected during FWIN on Scooteney Reservoir in 2015.

Scooteney Reservoir Recreational Opportunities

Water access is plentiful at Scooteney Reservoir, with abundant shore fishing and several boat ramps, including a double paved ramp with a launching float at the Bureau of Reclamation Park. That park also has a meticulously maintained grassy day-use area with picnic tables, overnight camping and RV hook-ups.

Conclusions

Walleye abundance declined from 2015 to 2016 in most of our FWIN waters; however, these populations are still robust and contain plenty of harvestable fish. We continue to encourage anglers to harvest their limit of Walleye when they have the opportunity. Too many Walleye in a population can have a negative impact on the rest of the fish community, which will in turn negatively impact the Walleye population as forage is reduced. Routine monitoring of these fisheries, through the use of FWIN as well as creel surveys, will ensure that we are not negatively impacting Walleye populations and that we are maintaining balance in these fish communities.

In speaking to many anglers and fishing clubs we have found that there is a strong catch-and-release mentality among Walleye anglers. Our data on Walleye populations over the past 12 years indicate that these populations can sustain more harvest and indeed need more harvest.

In 2006 the WDFW raised the daily limit to 8 Walleye per day on Lake Roosevelt, Potholes Reservoir, and Moses Lake. Unfortunately, few anglers took advantage of this as the results from our two-year creel survey on Potholes Reservoir and Moses Lake indicated low overall Walleye harvest. Creel surveys on FDR indicated that Walleye harvest was approximately 50,000 Walleye annually, which was 1/3 of the management goal. In 2013 WDFW raised the Walleye daily limit to 16 fish and removed size restrictions. In addition, WDFW opened the Spokane Arm to angling during the Walleye spawning season (April and May), when it had been previously closed. These regulations were liberalized in order to accomplish two primary management goals: improve Walleye growth and condition and bring about a balance in the predator/prey fish community. We are relying on anglers to help us achieve these management goals. We encourage anglers to help shape our Walleye populations to a more healthy condition by harvesting more fish.

Besides Walleye, Yellow Perch, Smallmouth Bass and Lake Whitefish were abundant in several of our FWIN lakes. Yellow Perch fishing on Banks Lake, Moses Lake and Potholes Reservoir can be excellent at times. Smallmouth Bass are abundant, and anglers report excellent fishing for them on all our FWIN lakes with the exception of Scooteney Reservoir, although they do present an opportunity there. Lake Whitefish are very abundant on FDR, Banks Lake, and Potholes Reservoir, yet are underutilized by most angler groups. There is a small, but dedicated, group of wintertime Lake Whitefish anglers on Banks Lake who target whitefish when they are spawning and also under the ice.

This report serves as a status update on popular Walleye fisheries in Washington and also as an informational guide on other fisheries in these lakes. For further details on the FWIN surveys conducted on various waters please contact regional warmwater fisheries biologists.

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