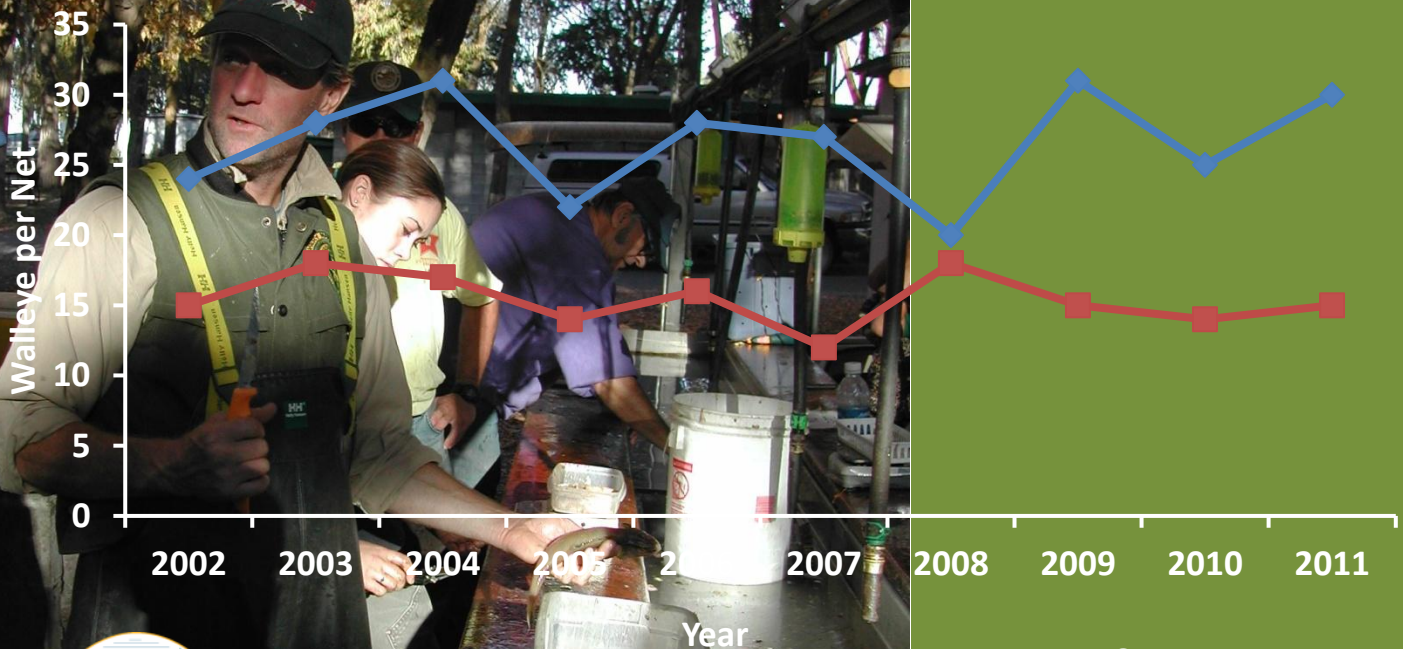




# Results from the 2011 Fall Walleye Index Netting (FWIN) Surveys in Washington State



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## Introduction

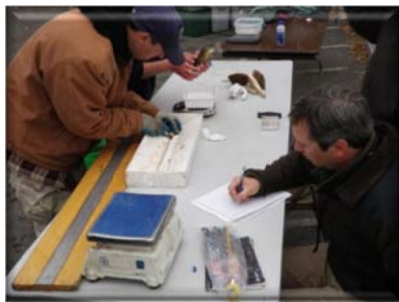
Effective management of recreational fisheries requires standardized sampling as well as the ability to manipulate fish populations through management efforts. In addition, fisheries managers must understand how changes in biological systems affect angler participation and success.

The Washington Department of Fish and Wildlife (WDFW) fisheries biologists, along with Spokane and Colville tribal fisheries biologists began monitoring important walleye populations in Washington in 2002 using Fall Walleye Index Netting (FWIN) methodologies. The FWIN methodologies were developed in Ontario as a means of monitoring a wide variety of biological parameters in walleye populations in a standardized fashion. Fisheries biologists from WDFW conduct FWIN surveys on five important walleye populations in eastern Washington (Figure 1) when water temperatures are 50–59°F, a range at which walleye are more equally distributed throughout lakes. Sampling effort (i.e. nets set per lake) is based on lake size, or the minimum number of nets needed to collect 300 walleye (Table 1).



The FWIN nets are 8-panel gill nets 200 feet long and have a catch bias toward percids (walleye and perch). Length and weight data, as well as relative abundance estimates, on other fish species are collected and presented but may not be an accurate representation of those populations. For instance, low numbers of largemouth bass and bluegill captured in a FWIN survey are not a cause for concern since these species are more effectively sampled using a boat electrofisher. In addition, length averages of smallmouth bass collected in gill nets tend to be higher than those collected via boat electrofishing and must be interpreted accordingly.

We collect length and age data on all walleye which allow us to determine the size distribution of the walleye population, the percentage of harvestable fish in the population and at what age walleye recruit to the fishery. Walleye ages are 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. It is important to note that female walleye typically grow faster and larger than male walleye; however, females typically mature at an older age than males (Figure 2). This information becomes critical in systems with high harvest rates. Walleye in Washington waters are not

overharvested. In fact, walleye anglers are encouraged to harvest many more walleye than they currently do. This is particularly important in Lake Roosevelt, Moses Lake and Potholes Reservoir. Length and age data, when combined with abundance data, also help us determine if a change in regulations is necessary or if regulations are helping us meet our management goals (Table 2).

The average number of walleye collected per net gives fisheries managers an accurate index of walleye population size. Throughout this report we report this as catch per unit effort (CPUE  $\pm$  80% confidence intervals). Abundance estimates, when examined over multiple years, reveal trends in populations and allow managers to make informed decisions on possible changes in angling regulations. Significant declines in abundance may signal a need for more restrictive regulations; whereas, increases in abundance, or stable populations at high abundance, may indicate the need for more liberal regulations.

Overall, walleye abundance in our FWIN waters is excellent with most lakes containing a high percentage of harvestable fish. The average CPUE for all lakes in 2011 was 12 walleye per net, and approximately 55 percent of the walleye collected from all lakes were over 14 inches. This is slightly higher than the percentage of walleye collected over 14 inches in 2010. Growth of walleye in Moses Lake, Potholes Reservoir, and Scootney Reservoir was excellent with walleye reaching 16 inches by fall of their second year. Growth of walleye in Banks Lake and FDR was slightly slower with walleye reaching 16 inches by fall of their third and fourth year, respectively. Anglers in search of larger walleye (> 18 inches) should visit Banks Lake, Moses Lake, and Potholes Reservoir.

In speaking to many anglers and fishing clubs we have found that there is a strong catch-and-release mentality among many angler groups. Our data on walleye populations over the past ten years indicates that our populations can endure more harvest. In fact, in 2006 we 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 that very few anglers ever retained a limit of walleye. We would like to take this opportunity to encourage anglers to harvest more walleye as 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 they begin to run out of food.

Besides walleye, yellow perch, smallmouth bass and lake whitefish were abundant in several of our FWIN lakes. Yellow perch populations are quite cyclical; however, perch fishing on Banks Lake and Moses Lake 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 Scootenev Reservoir. Lake whitefish are 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 under the ice. We are trying to encourage anglers to diversify their angling experiences by fishing for, and harvesting, more lake whitefish.

This report serves as a status update on major 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 the following regional warmwater fisheries biologists.

**Lake Roosevelt and Scootenev Reservoir**

Marc Divens or Randall Osborne  
WDFW Region One  
2315 North Discovery Place  
Spokane Valley, WA 99216-1566  
(509) 892-1001

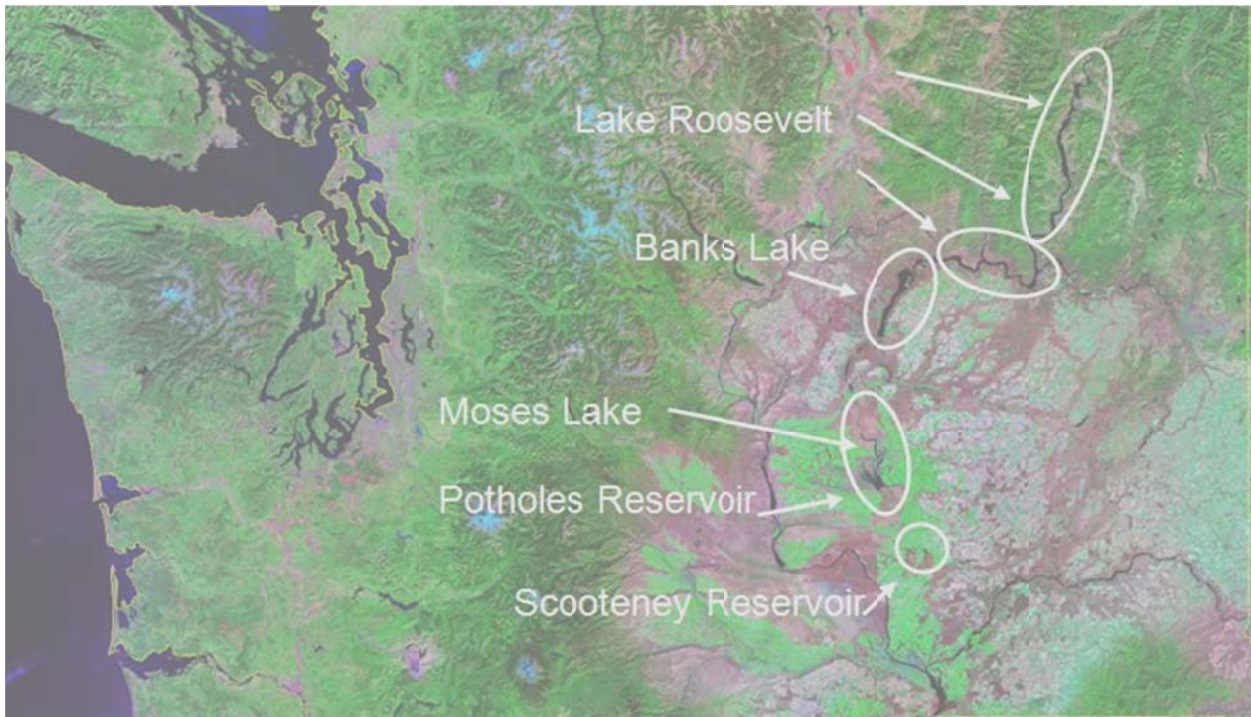
**Banks Lake, Moses Lake, and Potholes Reservoir**

Marc Petersen or Mike Schmuck  
WDFW Region Two  
1550 Alder Street NW  
Ephrata, WA 98823  
(509) 754-4546 x222 or x227

**Table 1.** Recommended minimum number of net sets for FWIN surveys based on lake surface area.

<b>Water Body Surface Area (Hectares)</b>	<b>Minimum number of net sets</b>	
<200		8
201—500	<i>Scooteney</i>	12
501—1000		14
1001—2000	<i>Moses*</i>	18
2001—3000		22
3000—5000		28
5001—10,000	<i>Potholes*</i>	36
10,001—20,000	<i>Banks</i>	48
>20,000	<i>FDR</i>	150

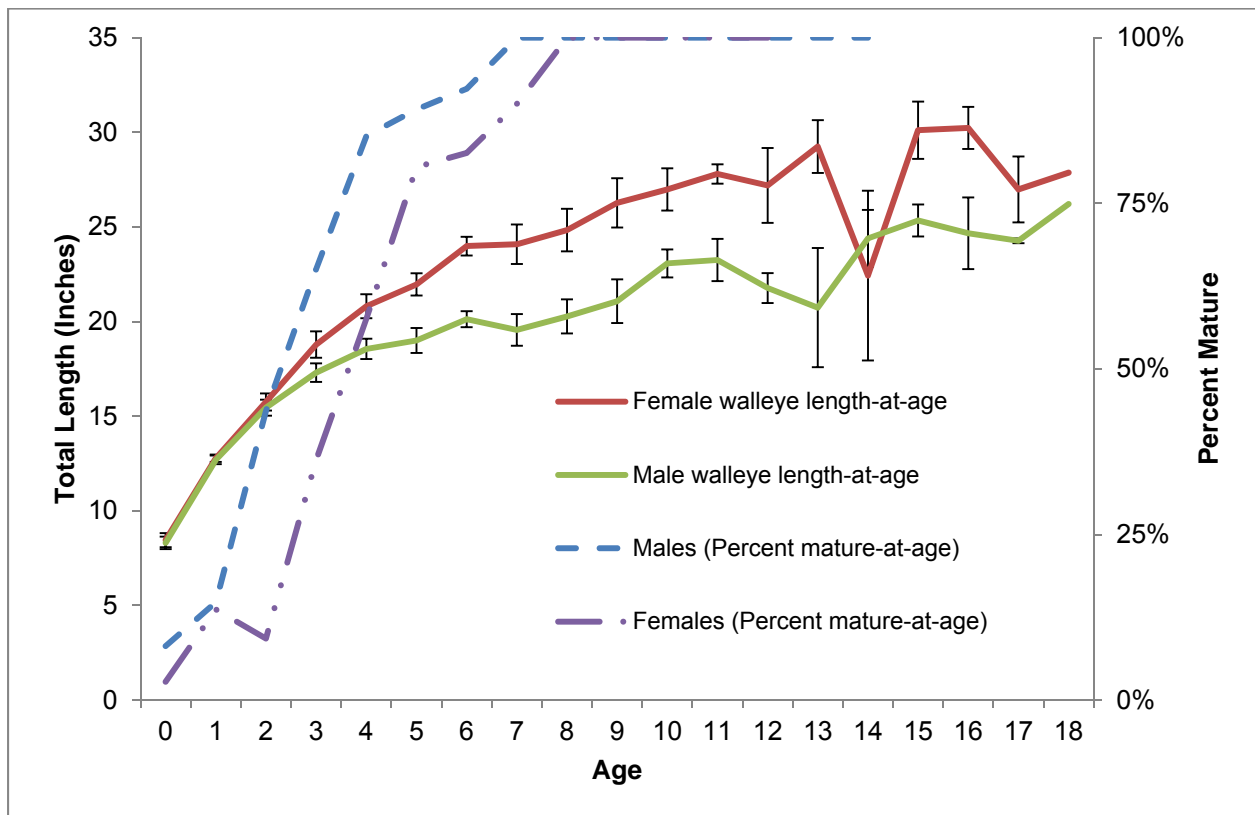
*\*Typically reach biological threshold (300 walleye) before minimum net number.*



**Figure 1.** Map of FWIN lakes in Washington.

**Table 2.** Walleye regulations for Washington FWIN lakes (as of spring 2012).

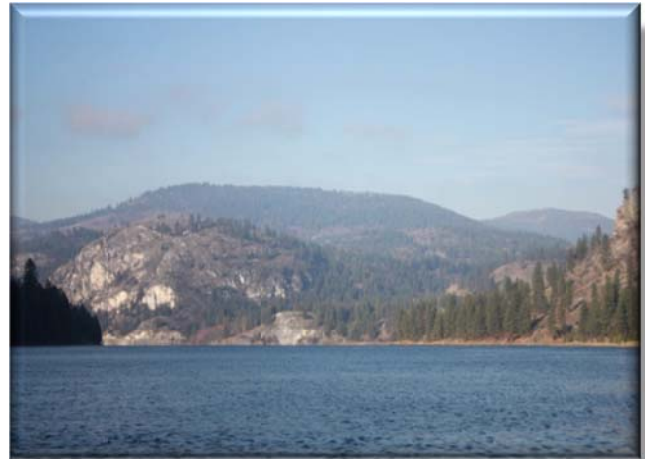
Lake	Season	Rule
Lake Roosevelt	Year-round	No Min. Size, Daily limit 8, only 1 over 22" may be retained.
Banks Lake	Year-round	Min. Size 16", Daily limit 5, only 1 over 22" may be retained.
Moses Lake	Year-round	Min. Size 12", Daily limit 8, only 1 over 22" may be retained.
Potholes Reservoir	Year-round	Min. Size 12", Daily limit 8, only 1 over 22" may be retained.
Scootenev Reservoir	Year-round	Min. Size 12", Daily limit 5, only 1 over 22" may be retained.



**Figure 2.** Average length-at-age ( $\pm 80\%$ CI) (solid lines) and average age at maturity (dashed lines) of walleye collected during FWIN surveys on five Washington lakes from 2002–2011.

## Lake Roosevelt (FDR)

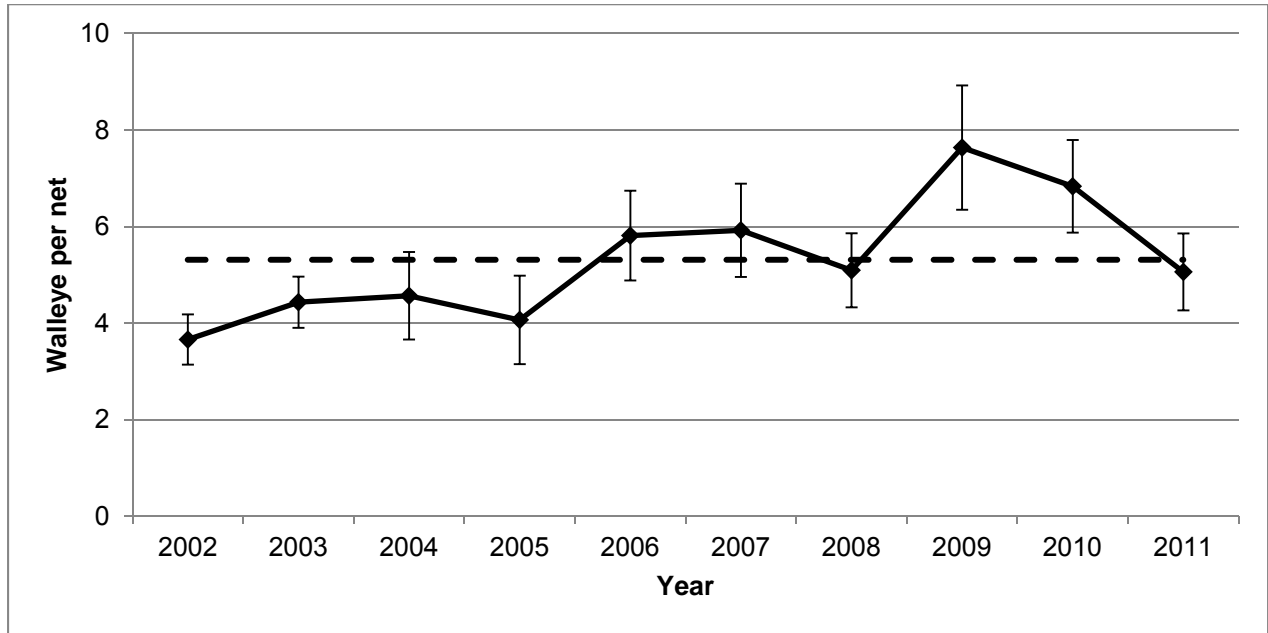
Walleye CPUE from FWIN surveys on Lake Roosevelt (2002–2011) varied from 3.6–7.6 walleye per net with an average of 5.3 for all years (Figure 3). The average length of walleye collected in 2011 was 14 inches and corresponds to walleye 2–3 years of age (Figure 4 and 5). This is consistent with the average length of walleye collected from 2002–2011. Only 10 percent of the walleye collected in 2011 were at least 16 inches (a size at which most anglers begin to



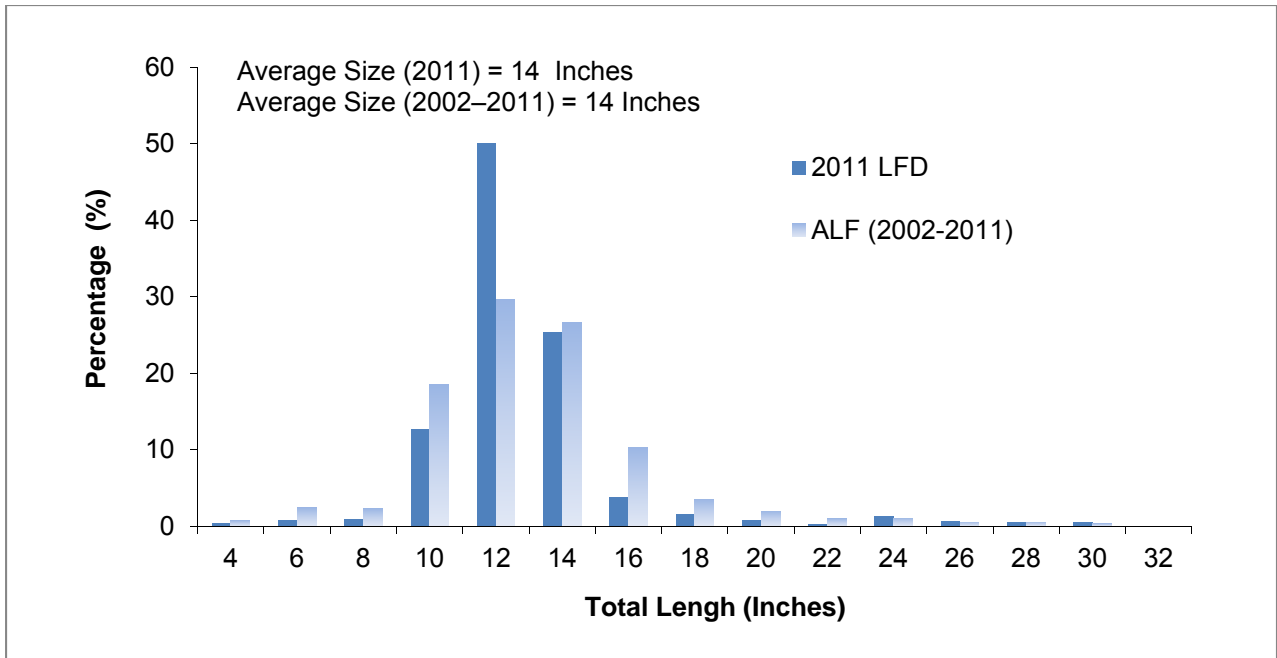
retain walleye). This is down considerably from 2010 when approximately 21 percent of the walleye collected were at least 16 inches. In 2011 approximately 75 percent of the walleye collected in Lake Roosevelt were 12–14 inches which should provide good angling opportunities for slightly smaller walleye. Length-at-age of walleye age 0 to 5 collected during 2011 was slightly lower than the long term northern lakes average with walleye reaching 16 inches by age-4. Length-at-age of older walleye fluctuated widely from year to year and showed no consistent trend. These data indicate not only a growing walleye population in Lake Roosevelt, but specifically, a growing number of fish in the two to three-year age-class (12-16 inches). This is raising concerns about predation impacts to kokanee and native redband rainbow trout. Because of this concern, WDFW will propose liberalizing the angling regulations on walleye in Lake Roosevelt and encourage anglers to harvest more fish under 16 inches.

Besides walleye, numerous other game fish species were collected during the 2011 FWIN survey on Lake Roosevelt, and anglers can expect to find diverse fishing opportunities. Smallmouth bass, burbot, and lake whitefish dominated the catch in 2011 while other species ranged in abundance from 1 to 5 percent of the total catch (Figure 7). Although in low abundance, rainbow trout, eastern brook trout, brown trout and kokanee were also collected during this survey. In addition, we also collected one northern pike. Despite the fact that anglers have reported catching northern pike in Lake Roosevelt this is the first northern pike collected by WDFW biologists. Other good game fish opportunities in FDR include yellow perch, burbot and lake whitefish. Lake whitefish are underutilized in all lakes in Washington in which they reside, but they are fun to catch and make very good table fare.

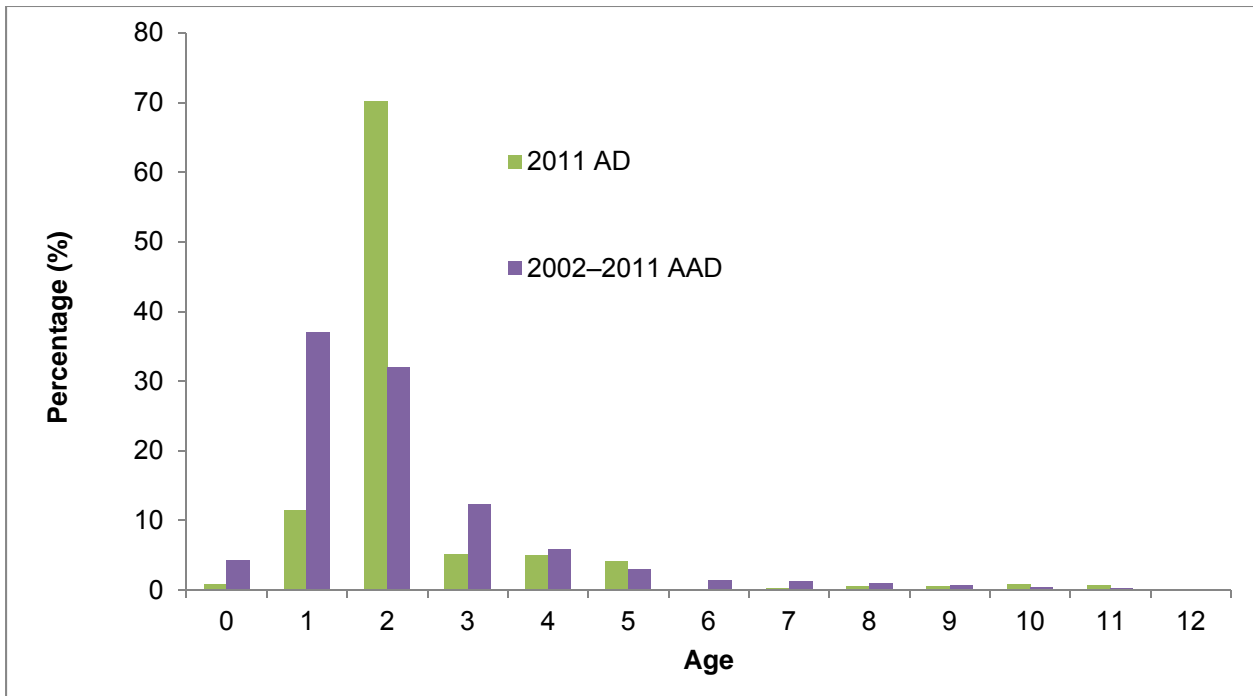
There are numerous access points along the 125 mile length of FDR on both sides. They are owned and operated by state, city, county and federal agencies, along with tribes and private businesses. There are both boat ramps and good shore angling opportunities. There are also numerous campgrounds, resorts and RV parking.



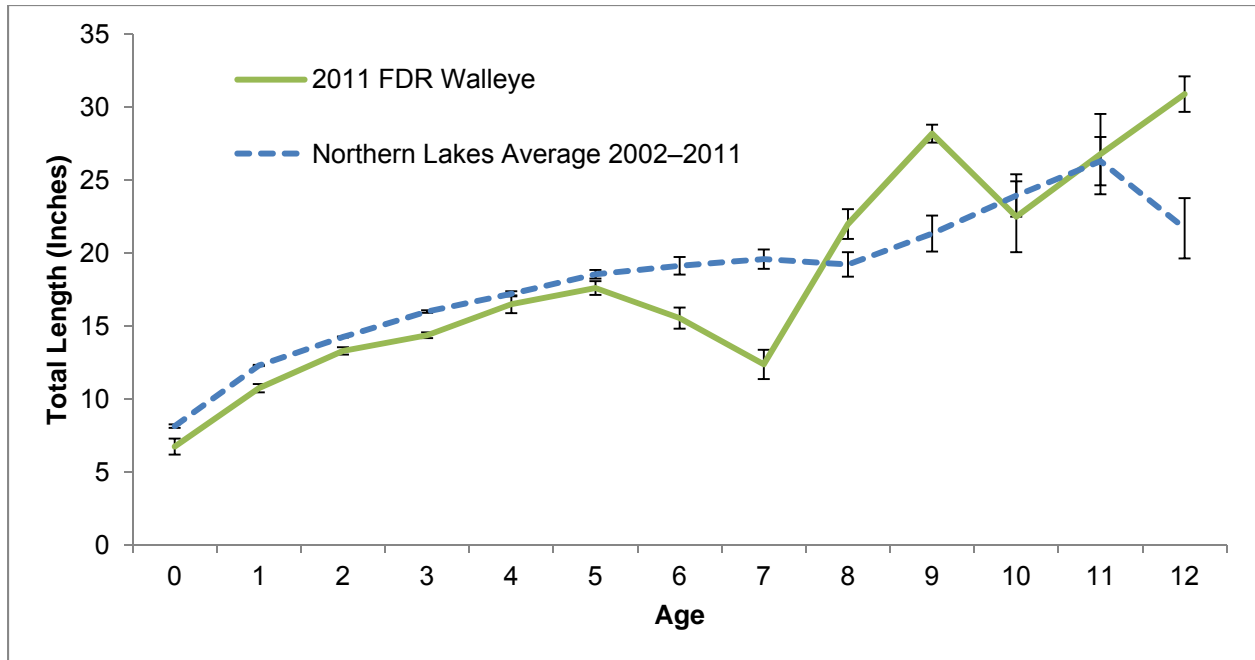
**Figure 3.** Average ( $\pm$  80% CI) number of walleye captured per net (CPUE) for all FWIN surveys on Lake Roosevelt (FDR) from 2002–2011 (Horizontal dashed line represents the average CPUE for all years 2002–2011).



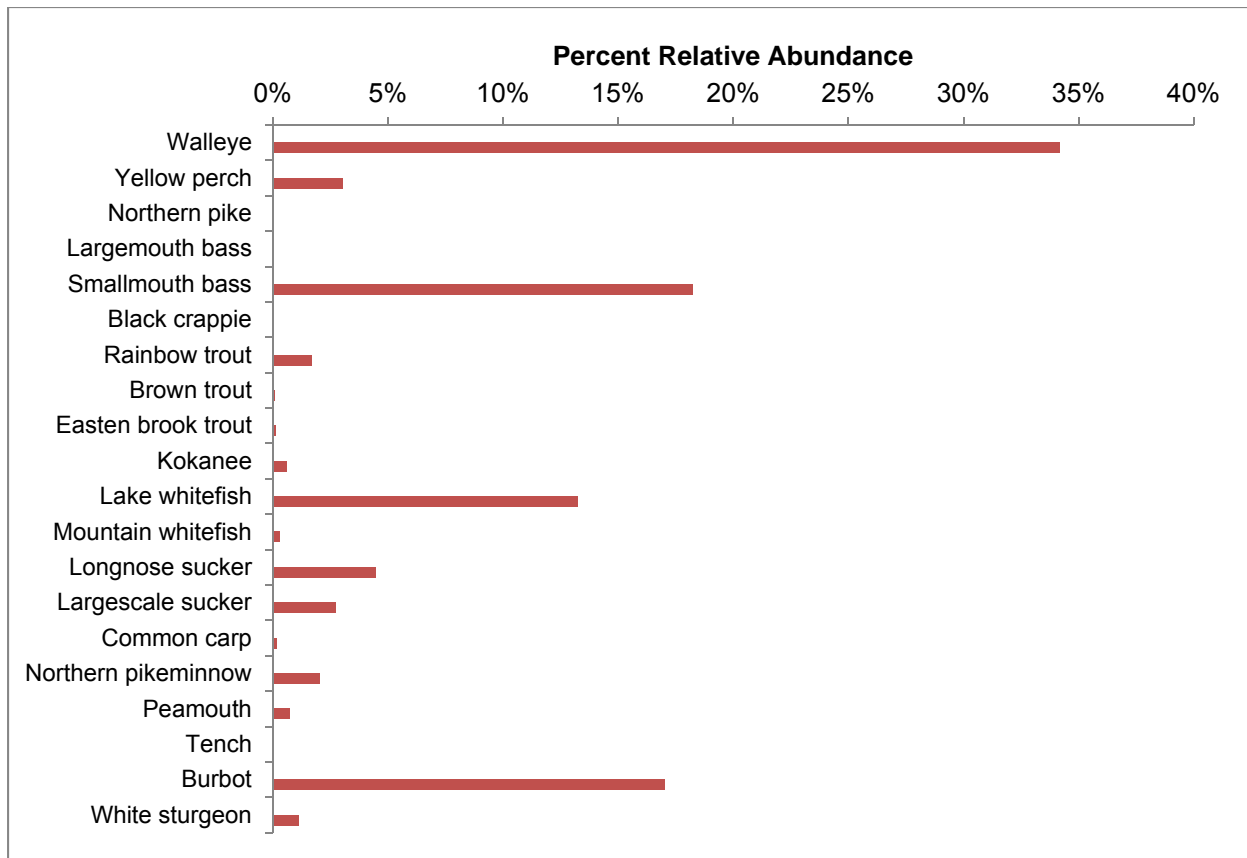
**Figure 4.** Percent length frequency distribution (LFD) of walleye collected during FWIN on Lake Roosevelt (FDR) in 2011 compared to the average length frequency (ALF) from all FWIN surveys on FDR from 2002–2011.



**Figure 5.** Age distribution (AD) of walleye collected during FWIN on Lake Roosevelt (FDR) in 2011 compared to the average age distribution (AAD) from all FWIN surveys on FDR from 2002–2011.



**Figure 6.** Length-at-age ( $\pm$  80% CI) of walleye collected during FWIN on Lake Roosevelt (FDR) in 2011 compared to the Northern Lakes Average from all FWIN Surveys on FDR and Banks Lake 2002–2011.



**Figure 7.** Relative abundance of fishes collected during FWIN on Lake Roosevelt (FDR) in 2011.



## Banks Lake

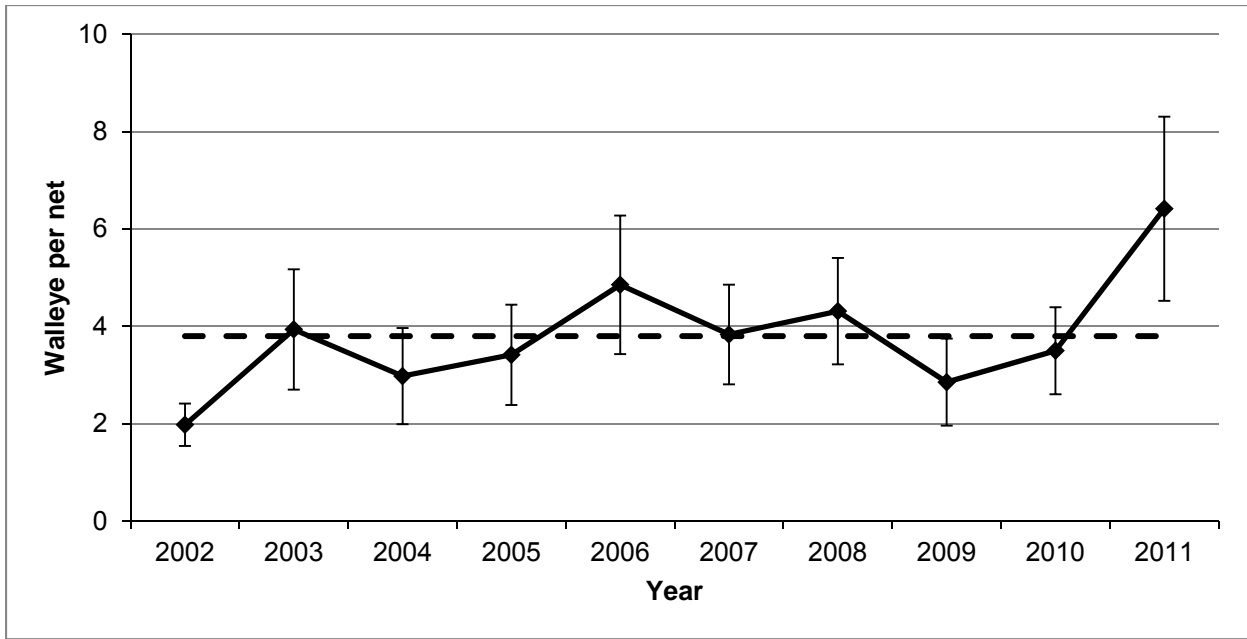
The CPUE of walleye from FWIN surveys on Banks Lake (2002–2011) varied from 2–6.4 walleye per net, with an average of 3.8 for all years (Figure 8). The CPUE of walleye collected in 2011 was the highest of all years (2002–2011) and was likely due to the drawdown of Banks Lake that occurred during 2011 which congregated fish into a smaller area. Walleye averaged 17 inches in 2011 which corresponded to walleye



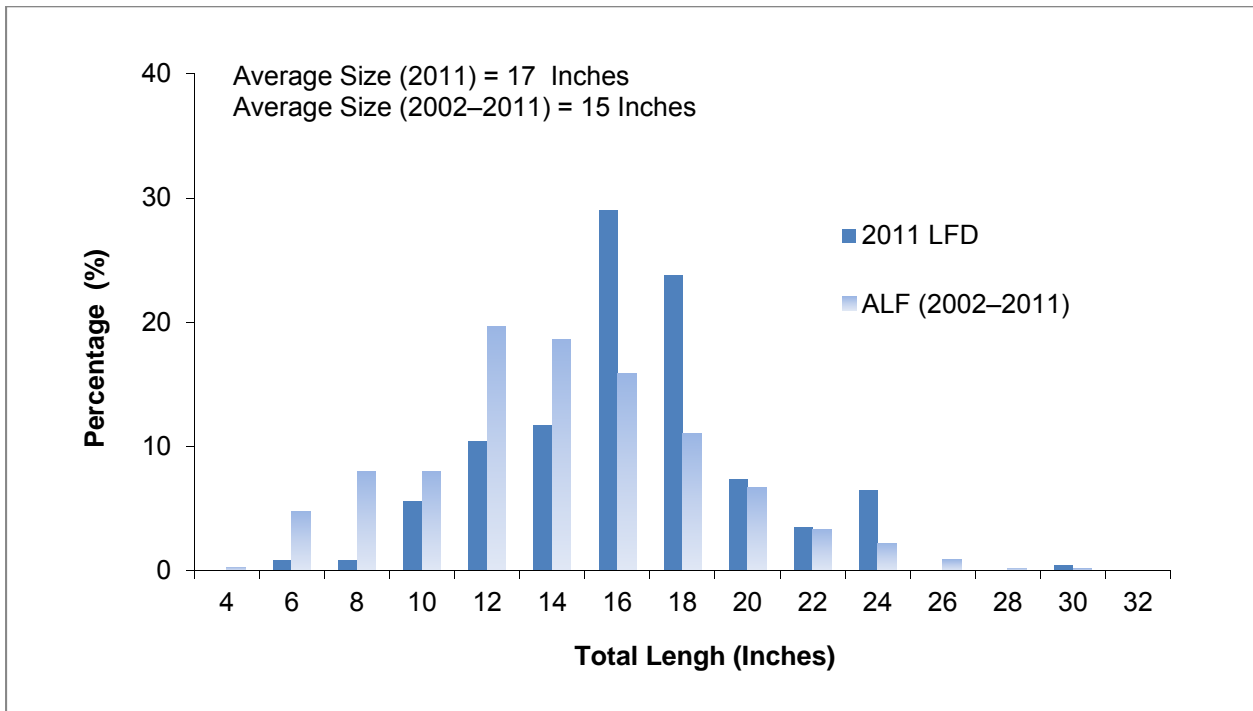
age 3 and 4 (Figure 9, 11). Approximately 70 percent of the walleye collected in 2011 were at least 16 inches and approximately 42 percent of the walleye collected were at least 18 inches, which is considerably higher than the long term average (2002–2011) and may be a predictor of good walleye production in 2012 and 2013 (Figure 10). Length-at-age of walleye collected on Banks Lake in 2011 was higher than the northern lakes average with walleye reaching 16 inches by age-2 (Figure 11). Overall, the Banks Lake walleye population appears to be relatively stable, if not increasing slightly, and should provide anglers with excellent angling opportunity in 2012, especially for larger fish.

Besides walleye, numerous other game fish species were collected during our 2011 FWIN survey on Banks Lake. Lake whitefish and yellow perch dominated the catch in 2011 while other species ranged in abundance from 1 to 10 percent of the total catch (Figure 12). Despite their abundance, large size (average weight 3 pounds in 2011), and palatability, few anglers exploit lake whitefish in Banks Lake. Lake whitefish are targeted by a small group of dedicated anglers in fall and winter. Similar to FDR, Banks Lake is an important smallmouth, and largemouth bass fishery hosting several bass tournaments each year. While not known for trophy smallmouth bass Banks Lake hosts a healthy, consistent smallmouth bass fishery. Banks Lake also contains very good opportunities for yellow perch, rainbow trout, black crappie and kokanee.

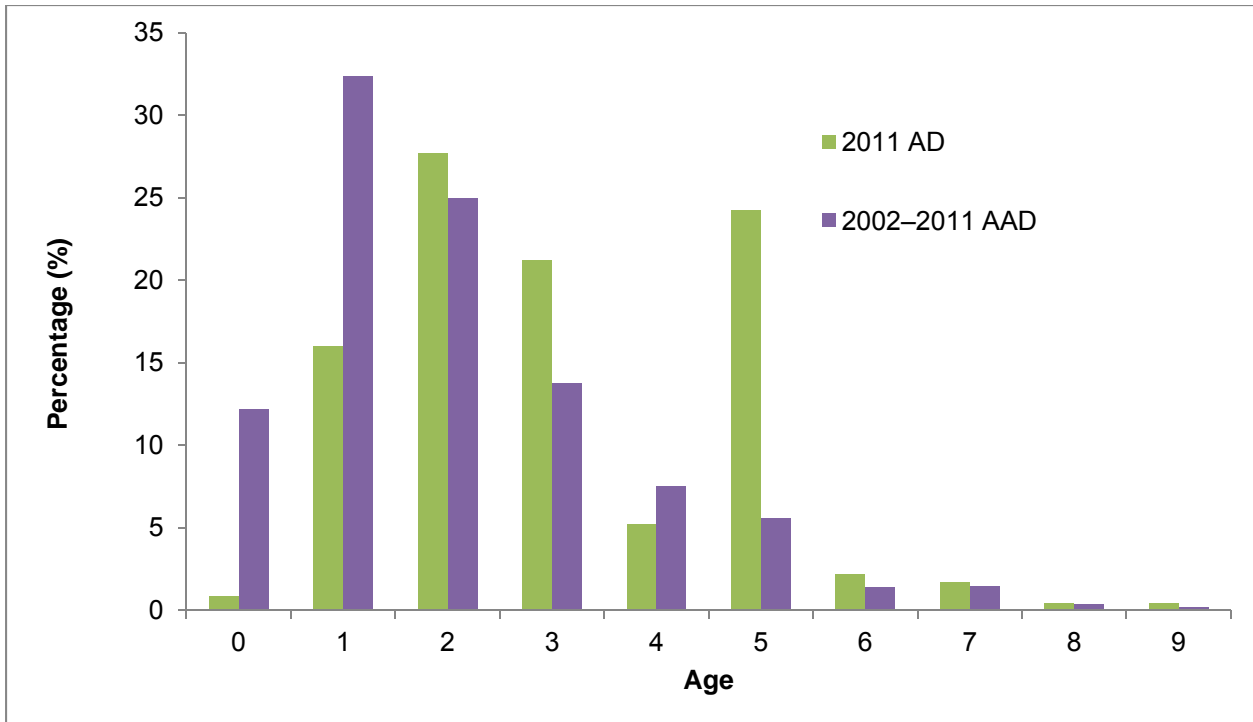
Banks Lake has numerous access points for launching boats and shore angling along its 25 mile length. The towns of Coulee City and Electric City at its south and north ends, respectively, offer lodging as well as city-owned parks with water access. Steamboat Rock State Park offers camping, trailer and RV hook-ups as well as excellently maintained boat ramps, shore angling and it surrounds the “Devil’s Punch Bowl”, which has very good largemouth bass and black crappie habitat.



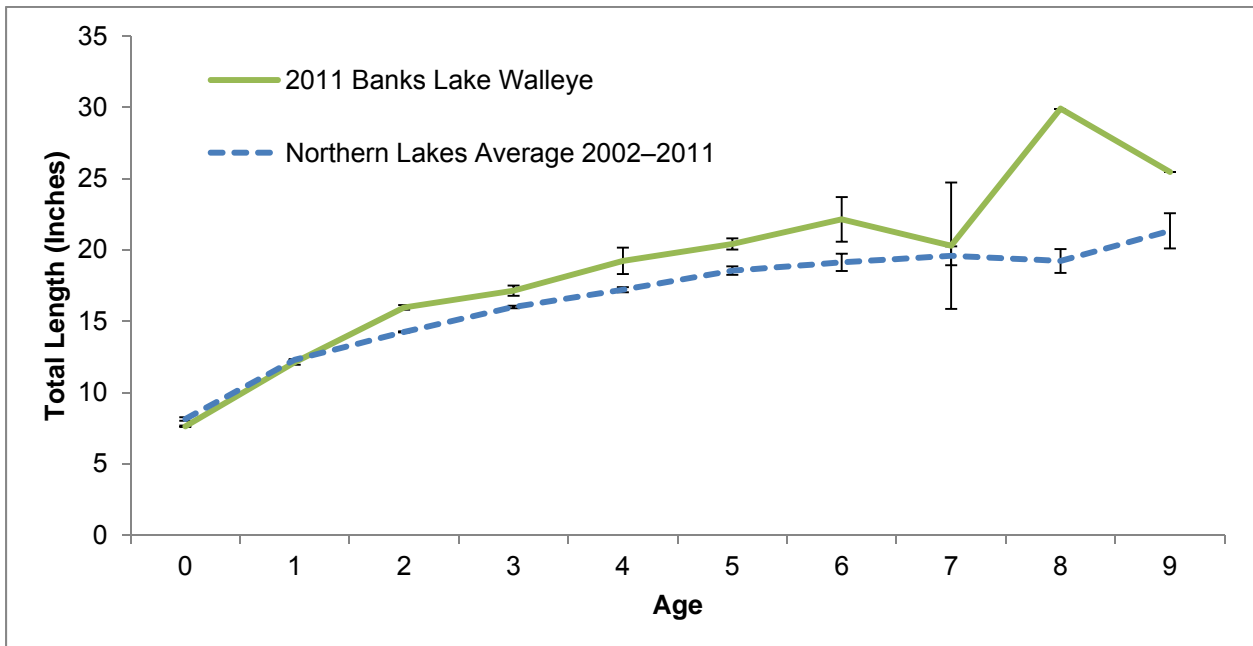
**Figure 8.** Average ( $\pm$  80% CI) number of walleye captured per net (CPUE) for all FWIN surveys on Banks Lake from 2002–2011 (Horizontal line represents the average CPUE for all years 2002–2011).



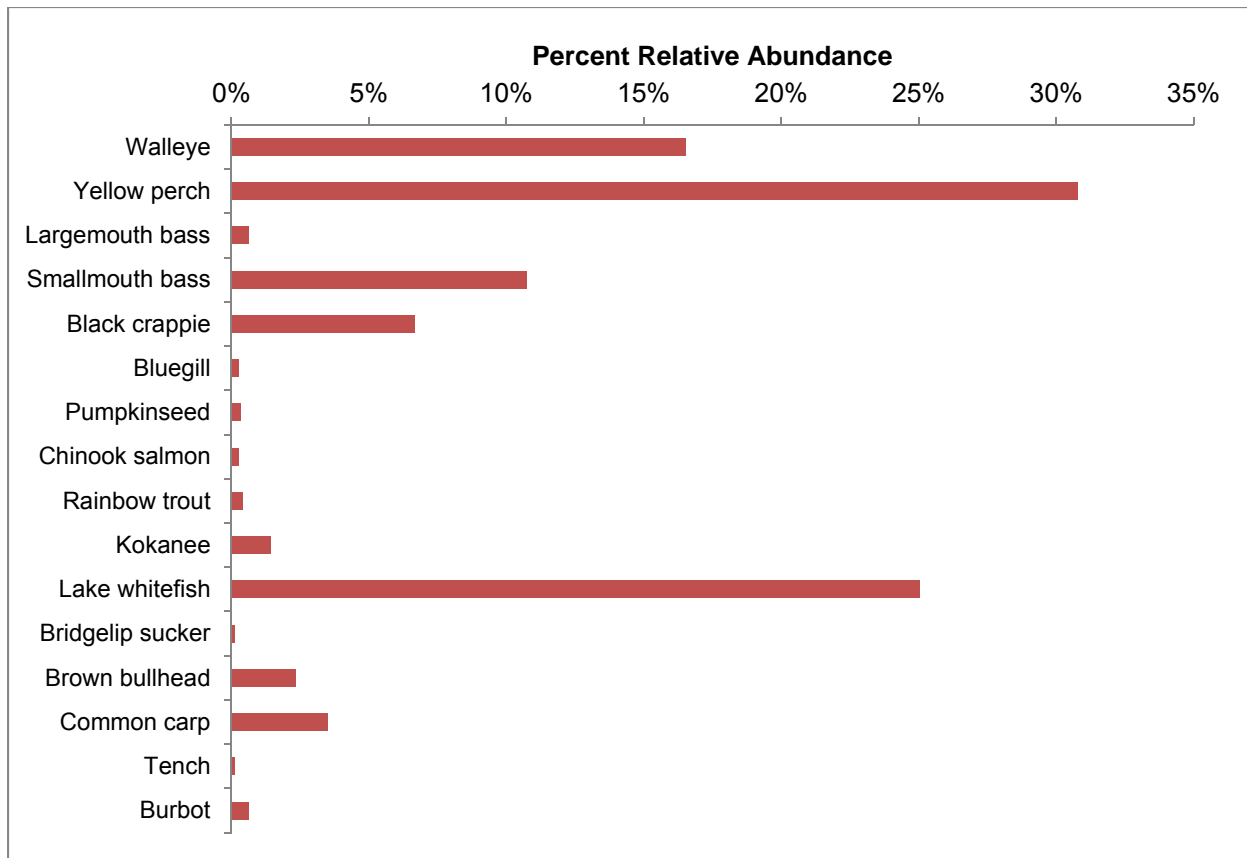
**Figure 9.** Percent length frequency distribution (LFD) of walleye collected during FWIN on Banks Lake 2011 compared to the average length frequency (ALF) from all FWIN surveys on Banks Lake from 2002–2011.



**Figure 10.** Age distribution (AD) of walleye collected during FWIN on Banks Lake 2011 compared to the average age distribution (AAD) from all FWIN surveys on Banks Lake from 2002–2011.



**Figure 11.** Length-at-age ( $\pm$  80% CI) of walleye collected during FWIN on Banks Lake in 2011 compared to the Northern Lakes Average from all FWIN Surveys on FDR and Banks Lake 2002–2011.



**Figure 12.** Relative abundance of fishes collected during FWIN on Banks Lake in 2011.

## Moses Lake

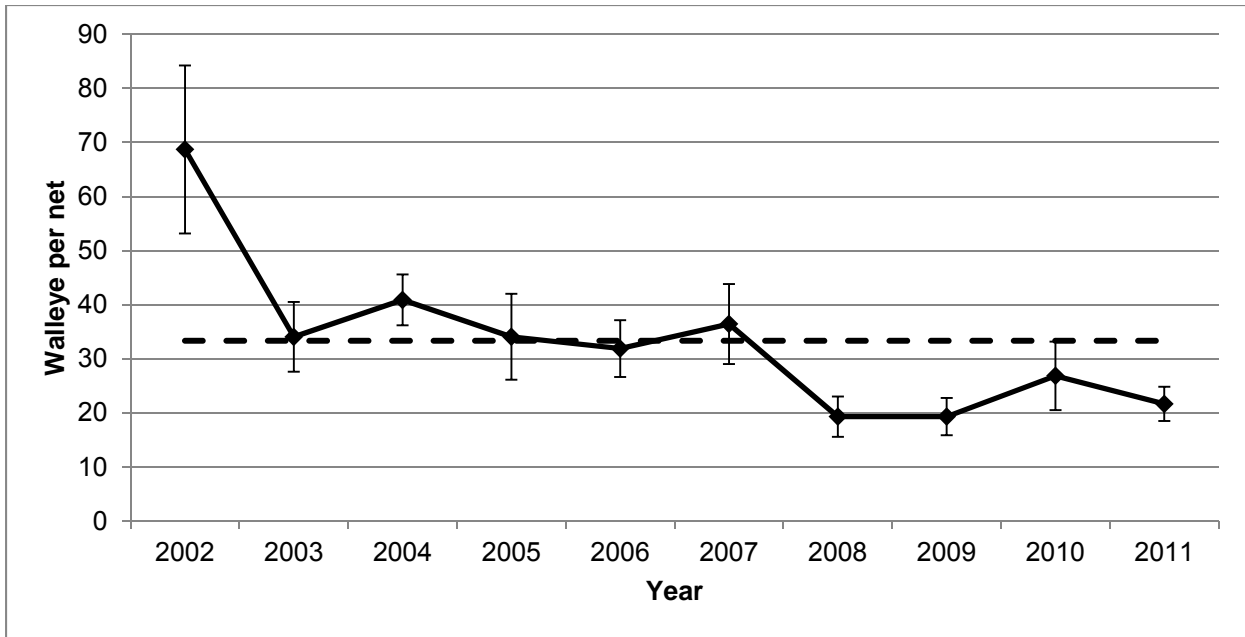
Walleye CPUE in Moses Lake declined slightly from 2010 to 2011 and has been below the long term average (33 walleye per net) since 2008. From 2003–2007 walleye CPUE varied from 32–41 walleye per net, and from 2008–2011 CPUE varied from 19–27 walleye per net. Despite these declines in CPUE the average walleye CPUE in Moses Lake is higher than any other FWIN lake in Washington (Figure 13). Approximately 72% of the walleye collected in 2011 were at least 16 inches which corresponds to walleye age-2 and above (Figure 14,16), and should provide anglers



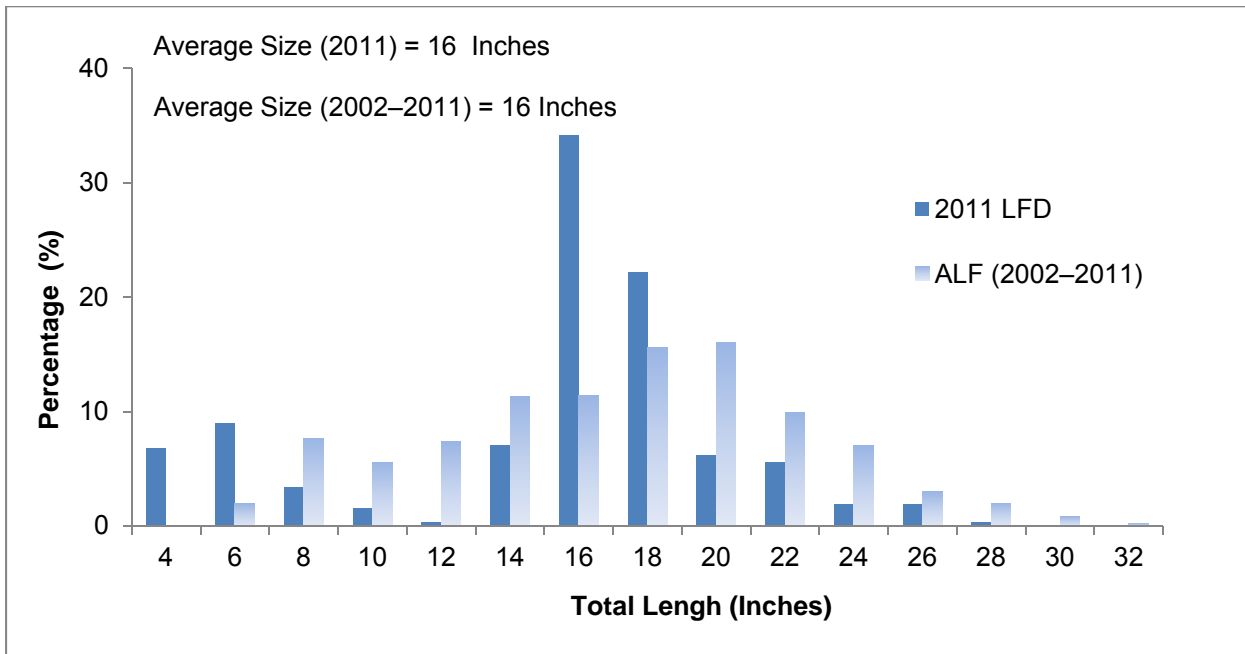
with plenty of opportunity to harvest walleye in 2012. Growth of walleye in Moses Lake was exceptional with walleye reaching 16 inches by fall of their second year (Age-1). Figure 16 shows length-at-age of walleye in Moses Lake being below average, but this is simply do to a small sample size of those age classes and is no cause for concern.

In addition to walleye, yellow perch dominated the catch in 2011 (Figure 17). For years Moses Lake has been a popular walleye and smallmouth bass fishery; however, in recent years Moses Lake 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, through the ice. Some anglers also target common carp with both hook and line and bow and arrow. Moses Lake has one of the most abundant common carp populations in the state and they can be both challenging to catch on hook and line and put up a fierce fight.

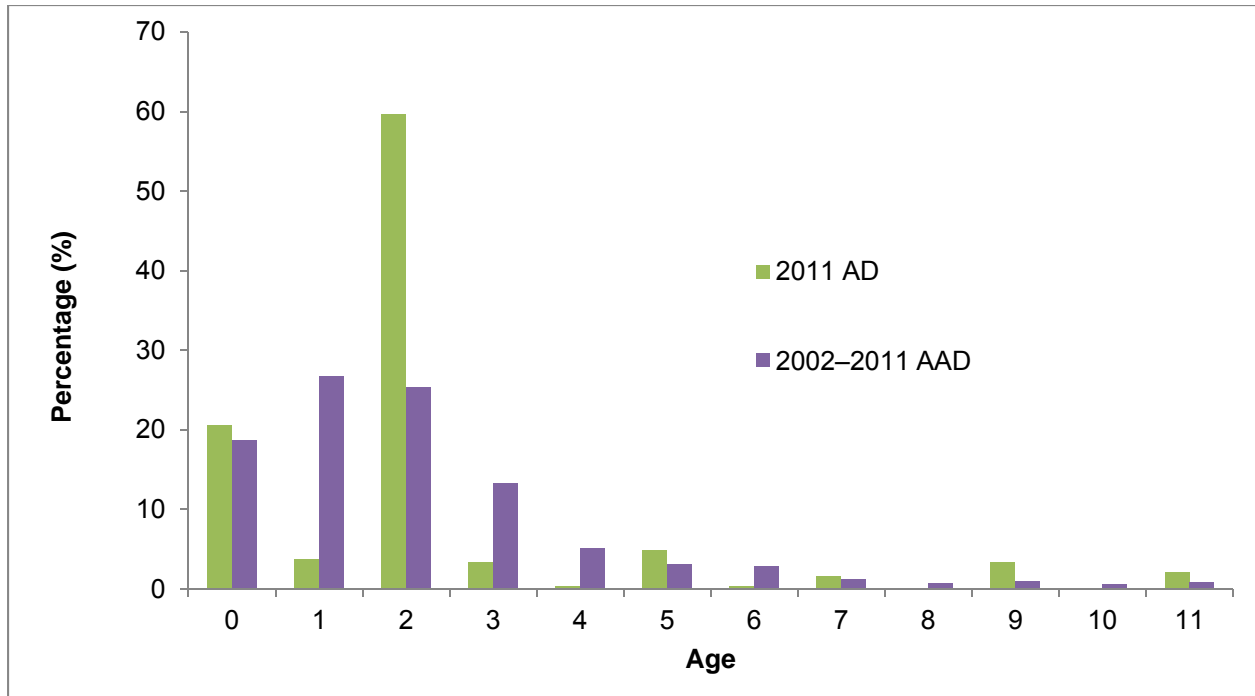
There are five public boat launches on Moses Lake. The city of Moses Lake offers lodging and two city-owned parks with boat ramps and docks. In addition to water access these parks offer grass day-use areas with picnic tables. Cascade Park also has camping facilities and boat moorage.



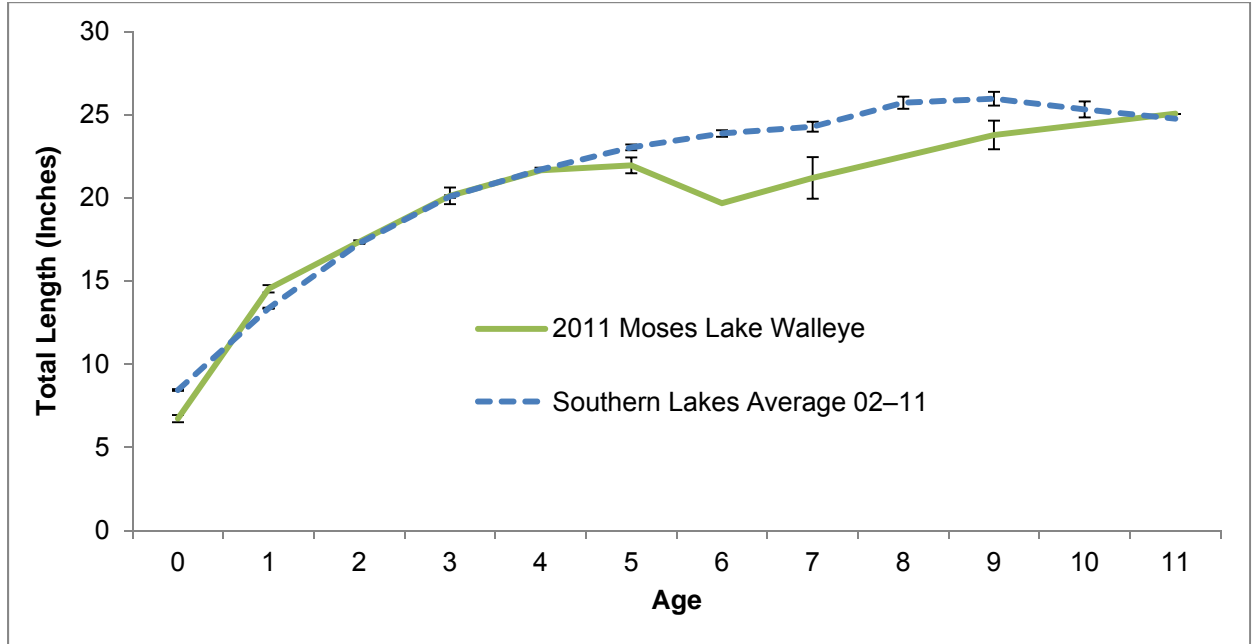
**Figure 13.** Average ( $\pm$  80% CI) number of walleye captured per net (CPUE) for all FWIN surveys on Moses Lake from 2002–2011 (Horizontal line represents the average CPUE for all years 2002–2011).



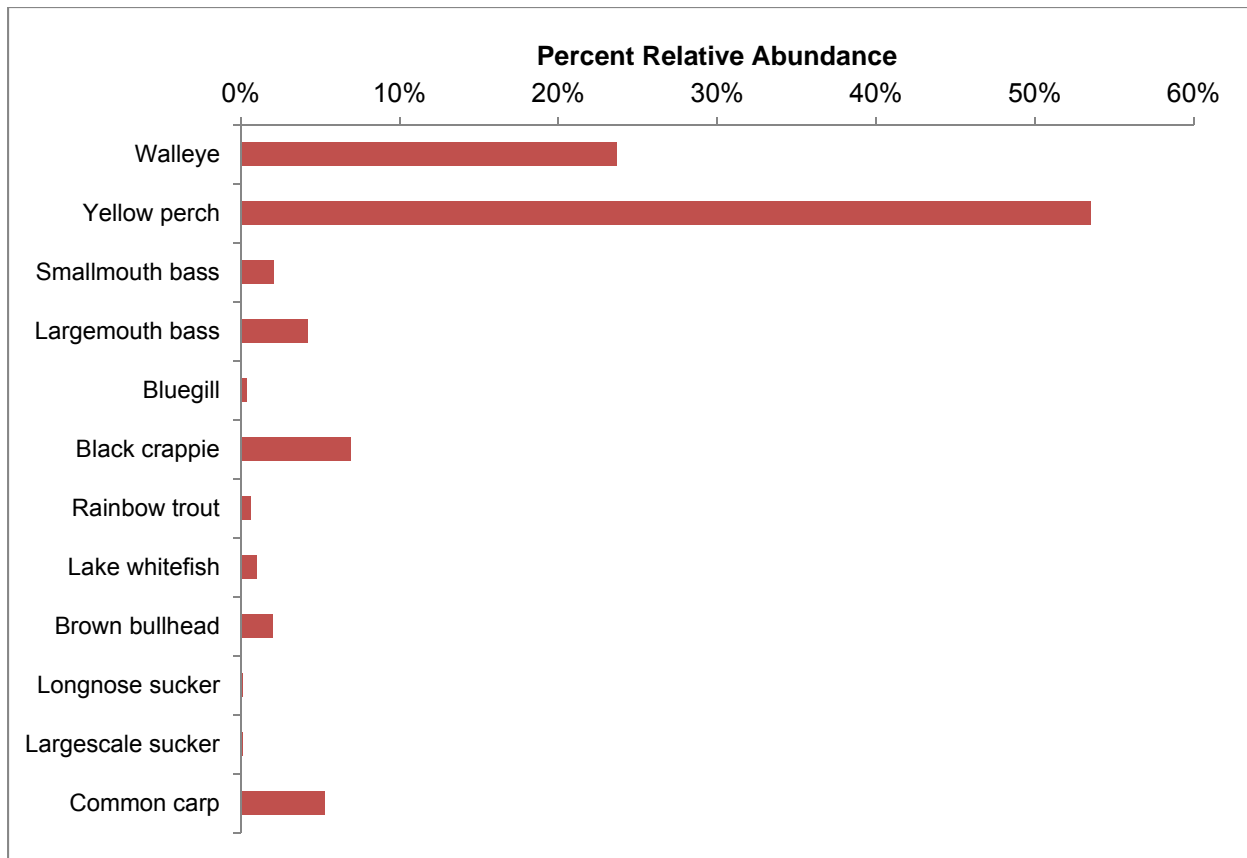
**Figure 14.** Percent length frequency distribution (LFD) of walleye collected during FWIN on Moses Lake 2011 compared to the average length frequency (ALF) from all FWIN surveys on Moses Lake from 2002–2011.



**Figure 15.** Age distribution (AD) of walleye collected during FWIN on Moses Lake 2011 compared to the average age distribution (AAD) from all FWIN surveys on Moses Lake from 2002–2011.



**Figure 16.** Length-at-age ( $\pm$  80% CI) of walleye collected during FWIN on Moses Lake in 2011 compared to the Southern Lakes Average from all FWIN Surveys on Moses Lake, Potholes Reservoir, and Scooteny Reservoir 2002–2011.



**Figure 17.** Relative abundance of fishes collected during FWIN on Moses Lake in 2011.



## Potholes Reservoir

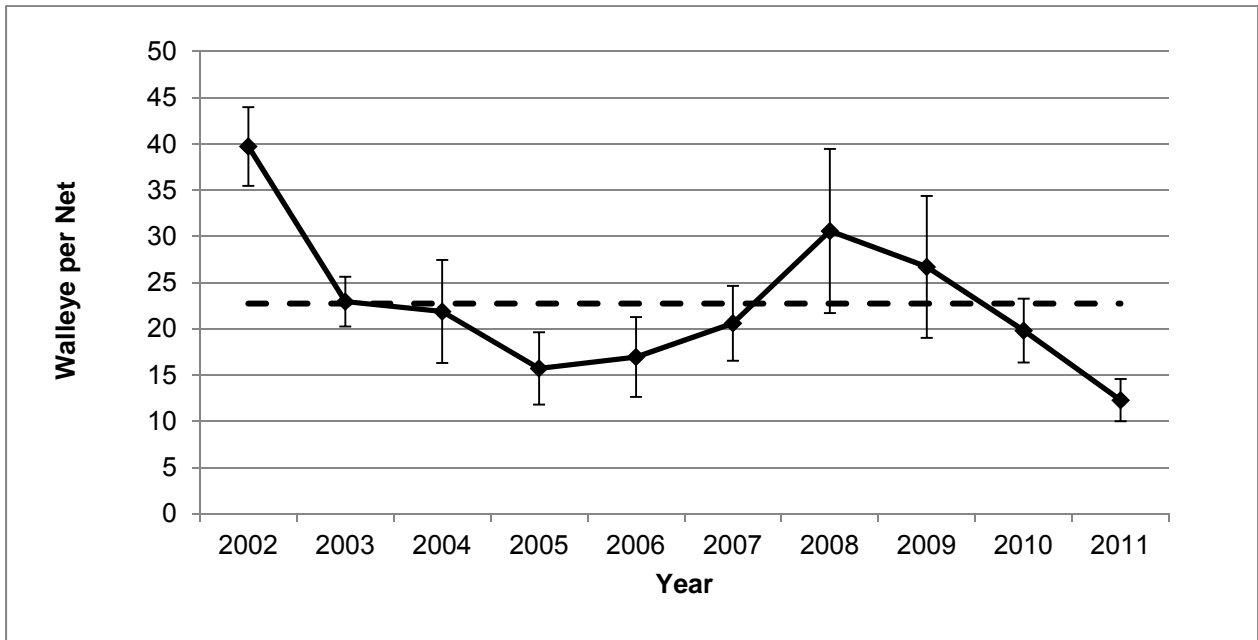
The CPUE of walleye from FWIN surveys on Potholes Reservoir has varied considerably over the years. In 2002 the CPUE averaged 40 walleye per net; whereas, in 2011 it averaged only 12 walleye per net (Figure 18). The average size of walleye collected in 2011 was 16 inches (Figure 19) and corresponds to age-2 walleye (Figure 21). This was consistent with the long-term average (2002-2011). Approximately 56 percent of the walleye collected in 2011 were at least 16 inches, and approximately 47 percent of the walleye collected were at least 18 inches. These data indicate very good angling opportunities (Figure 20). The abundance of age 1 and 2 walleye in Potholes Reservoir should be a boon for anglers in 2012 (Figure 20). Potholes walleye have one of the fastest growth rates in Washington with fish reaching 16 inches between age 1 and 2 (Figure 21). Length-at-age of walleye age 1-7 was at, or near, the southern lakes average. Length-at-age of older walleye fluctuated somewhat, likely due to the small sample size of older fish (Figure 21). Potholes Reservoir should provide anglers with excellent opportunities for large walleye in 2012.



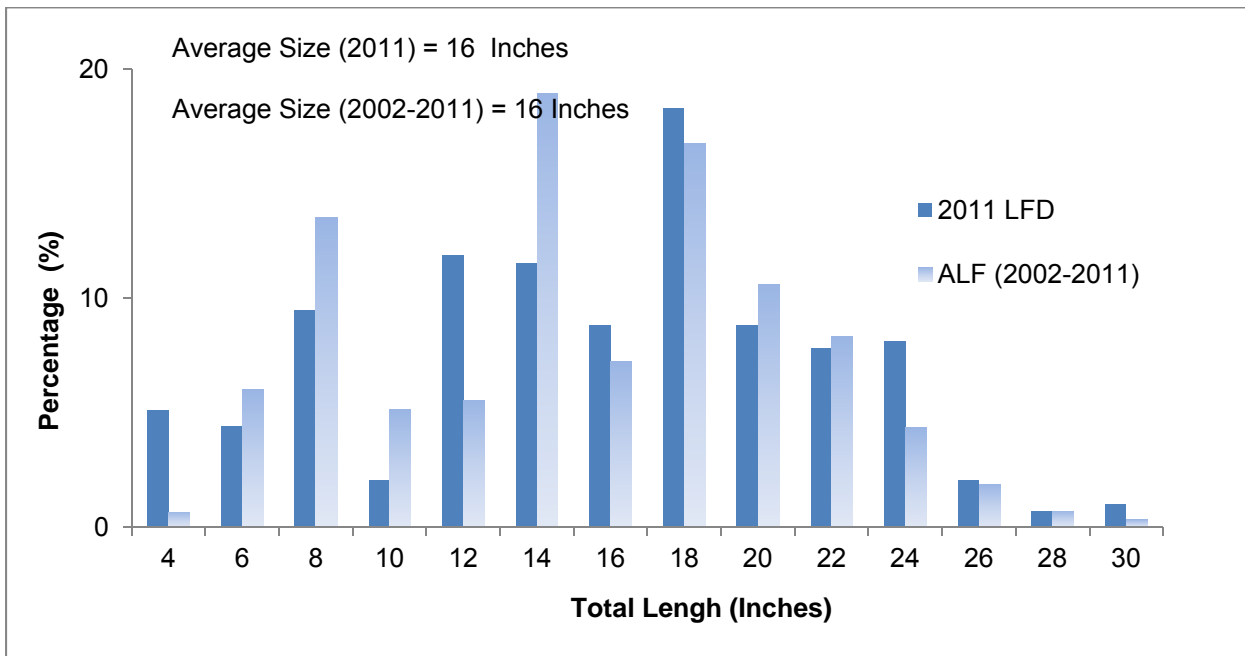
In addition to walleye, lake whitefish were abundant in our samples. Unfortunately, despite their abundance, large size (average weight 3 pounds in 2011), and palatability, few anglers exploit lake whitefish in Potholes Reservoir. Lake whitefish are a popular game fish in the Midwest and is the most economically valuable freshwater species of the Great Lakes where anglers often target them in January and February.

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. 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. 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

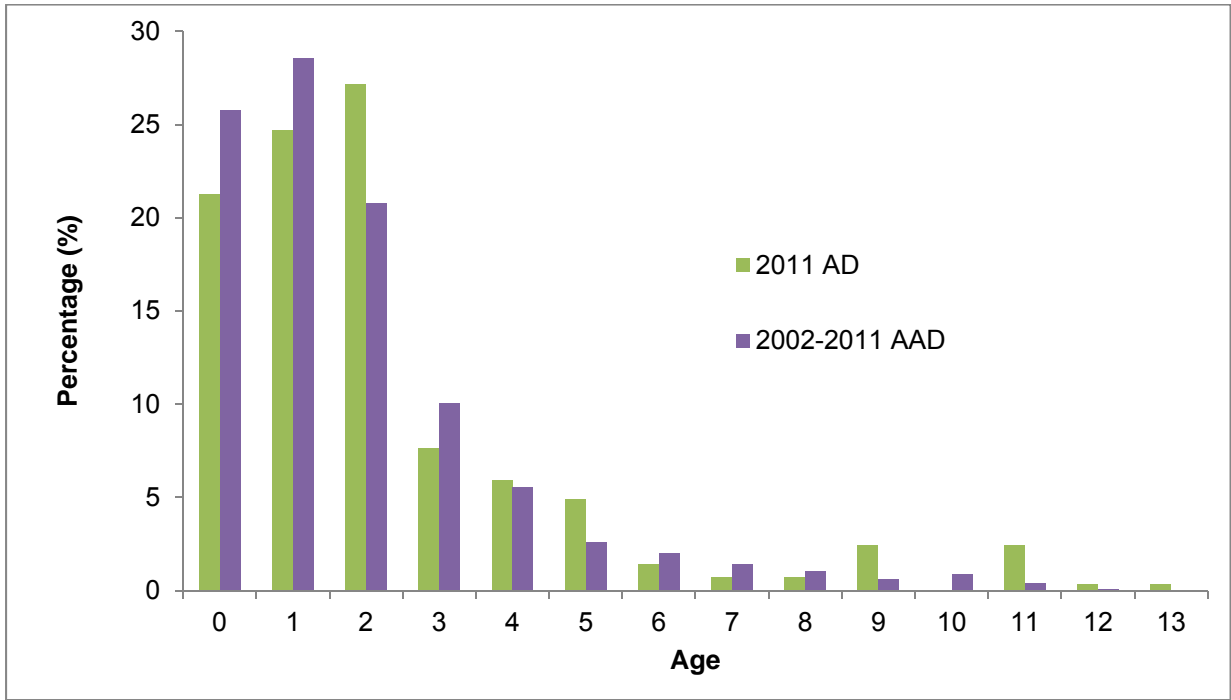
fishing as well as trout and panfish. Those lakes are relatively small and offer very good shore access for fishing.



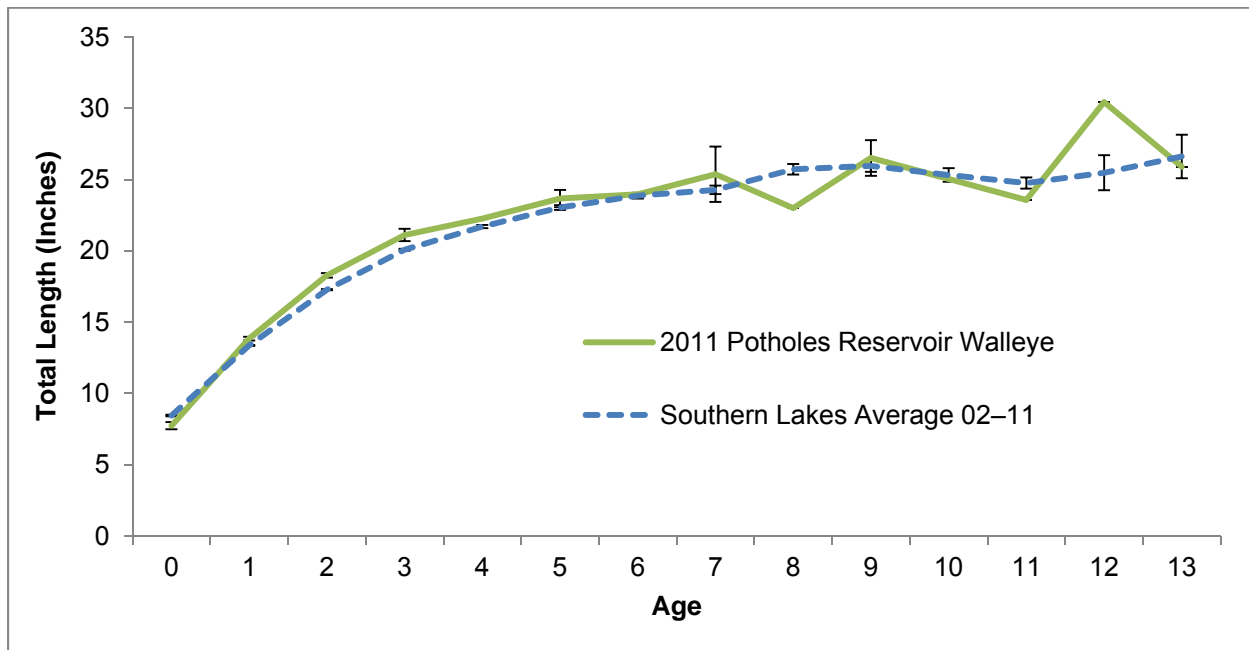
**Figure 18.** Average ( $\pm$  80% CI) number of walleye captured per net (CPUE) for all FWIN surveys on Potholes Reservoir from 2002–2011 (Horizontal line represents the average CPUE for all years 2002–2011).



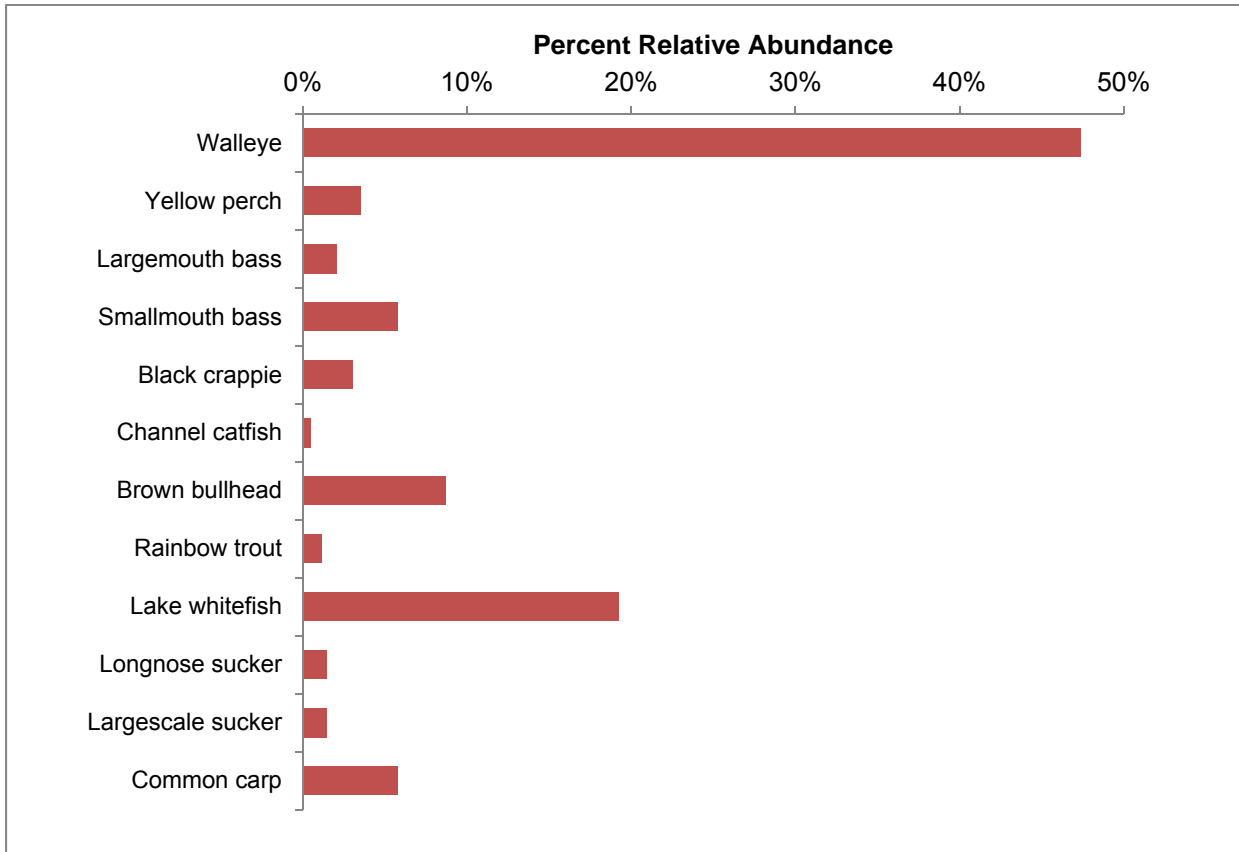
**Figure 19.** Percent length frequency distribution (LFD) of walleye collected during FWIN on Potholes Reservoir 2009 and 2010 compared to the average length frequency (ALF) from all FWIN surveys on Potholes Reservoir from 2002–2010.



**Figure 20.** Age distribution (AD) of walleye collected during FWIN on Potholes Reservoir 2011 compared to the average age distribution (AAD) from all FWIN surveys on Potholes Reservoir from 2002–2011.



**Figure 21.** Length-at-age ( $\pm$  80% CI) of walleye collected during FWIN on Potholes Reservoir in 2011 compared to the Southern Lakes Average from all FWIN Surveys on Moses Lake, Potholes Reservoir, and Scootenev Reservoir 2002–2011.



**Figure 22.** Relative abundance of fishes collected during FWIN on Potholes Reservoir in 2011.

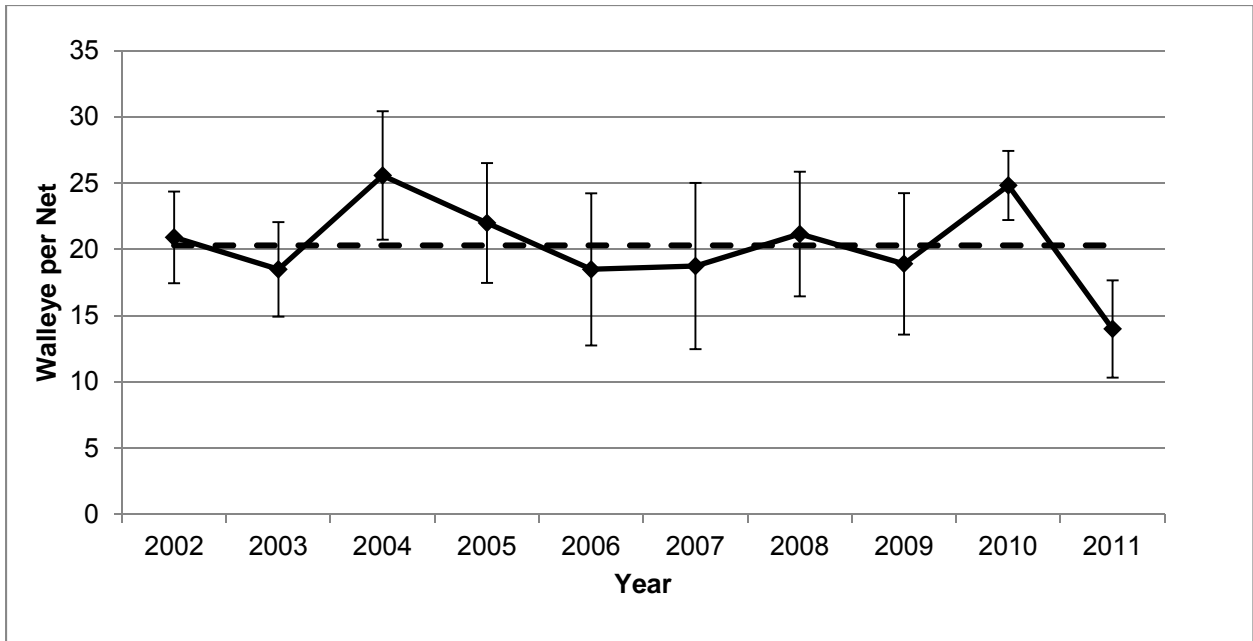
## Scooteney Reservoir

The CPUE of walleye in Scooteney Reservoir has been the most stable of the three southern FWIN lakes (Moses, Potholes, Scooteney) (Figure 23) despite the fact that walleye CPUE dropped to 14 walleye per net in 2011. The average size of walleye collected in 2011 was 14 inches, which is consistent with the long-term average. Most walleye collected were between 12 and 16 inches (Figure 24). This corresponds to walleye 1 and 2 years of age (Figure 25 and 26). On average, 28 percent of the walleye collected during FWIN surveys (2002-2011) were  $\geq 16$  inches (the length at which most anglers begin to retain walleye). In 2011, this percentage dropped slightly to 25 percent. While Scooteney Reservoir has a low percentage of large walleye (at least 18 inches) anglers should find excellent opportunities for 12-16 inch walleye. Length-at-age of walleye in Scooteney reservoir was below the southern lakes average for most age classes, with walleye reaching 16 inches by age 2-3. (Figure 26)

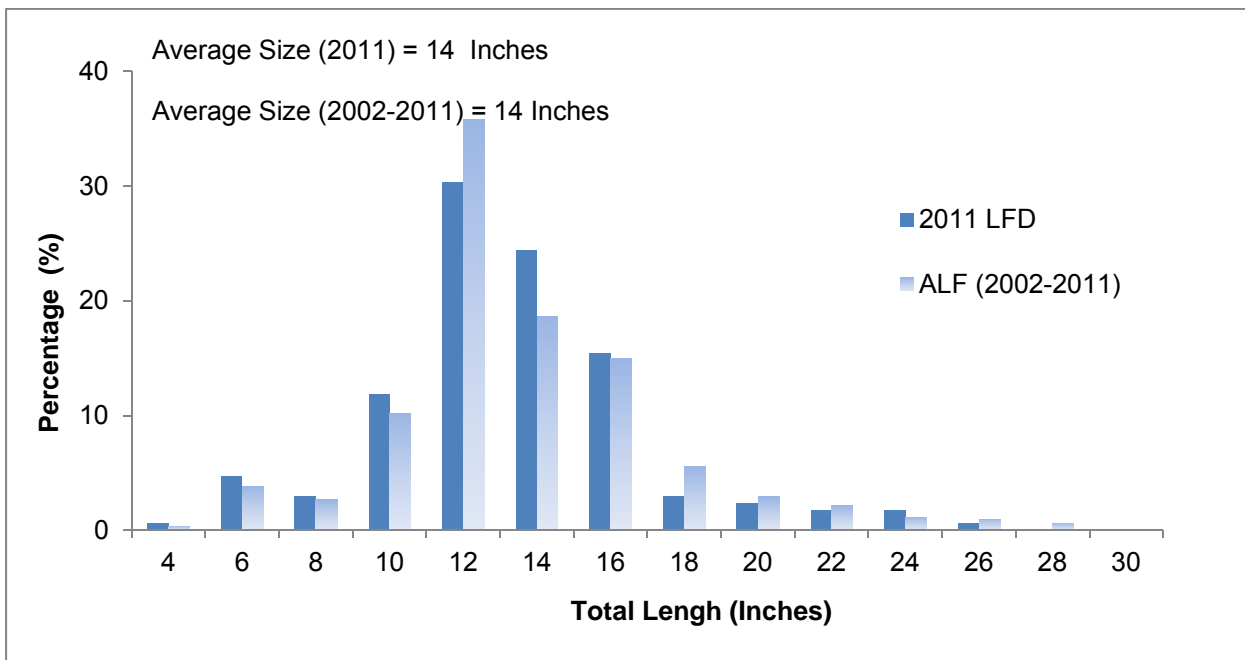


In addition to walleye, yellow perch dominated the catch in our 2011 FWIN survey of Scooteney Reservoir. Abundant yellow perch in walleye lakes has been linked to lower catch rates for walleye anglers. This is likely due to the fact that yellow perch are favored forage of walleye and when walleye are satiated with perch they are less likely to take an angler's offering. Twelve other species were collected; however, none represented more than 6 percent of the total catch, although there are very good opportunities for some larger yellow perch, along with smallmouth and largemouth bass, black crappie and, once again, lake whitefish.

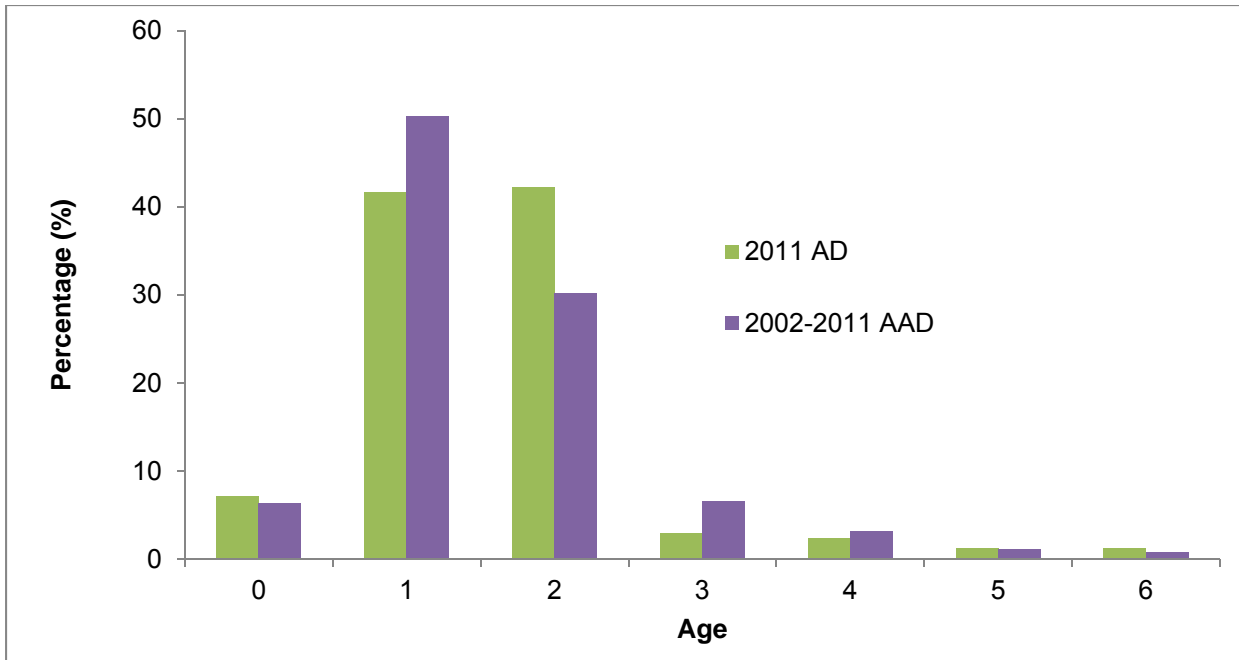
Water access is plentiful at Scooteney Reservoir, with abundant shore fishing and several boat ramps, including a double paved ramp with a launching float at the Bureau of Reclamation park. That park also has a meticulously maintained grassy day-use area with picnic tables, overnight camping and RV hook-ups.



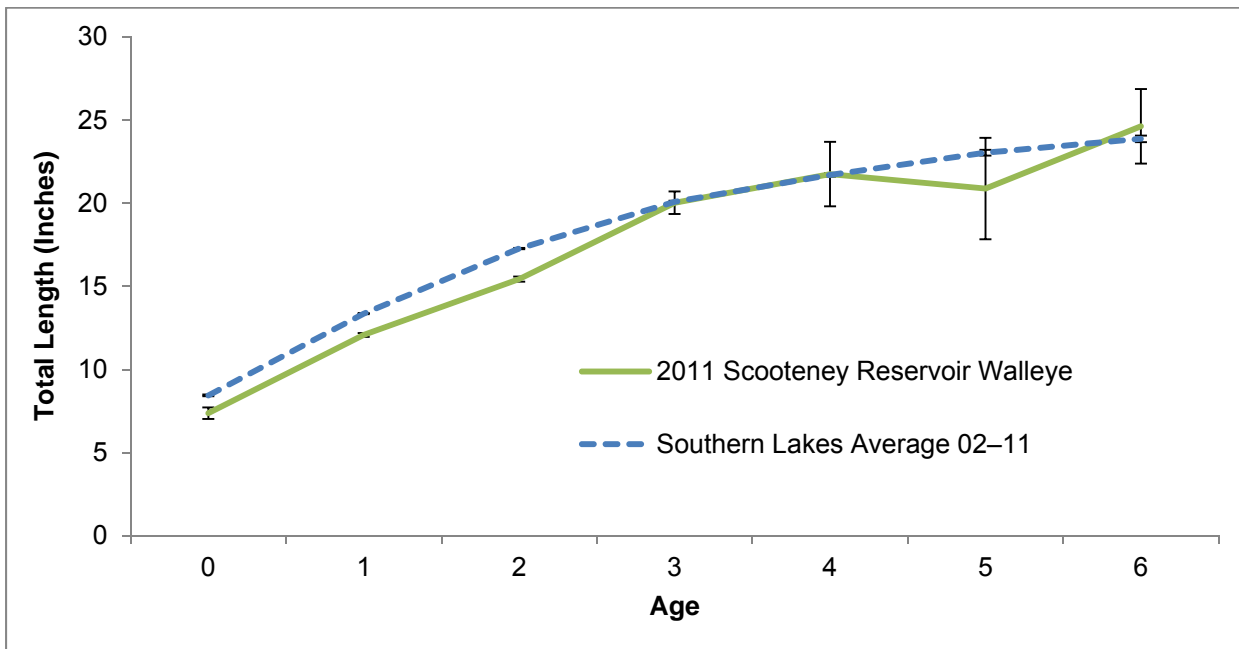
**Figure 23.** Average ( $\pm$  80% CI) number of walleye captured per net (CPUE) for all FWIN surveys on Scooteny Reservoir from 2002–2011. (Horizontal line represents the average CPUE for all years 2002–2011).



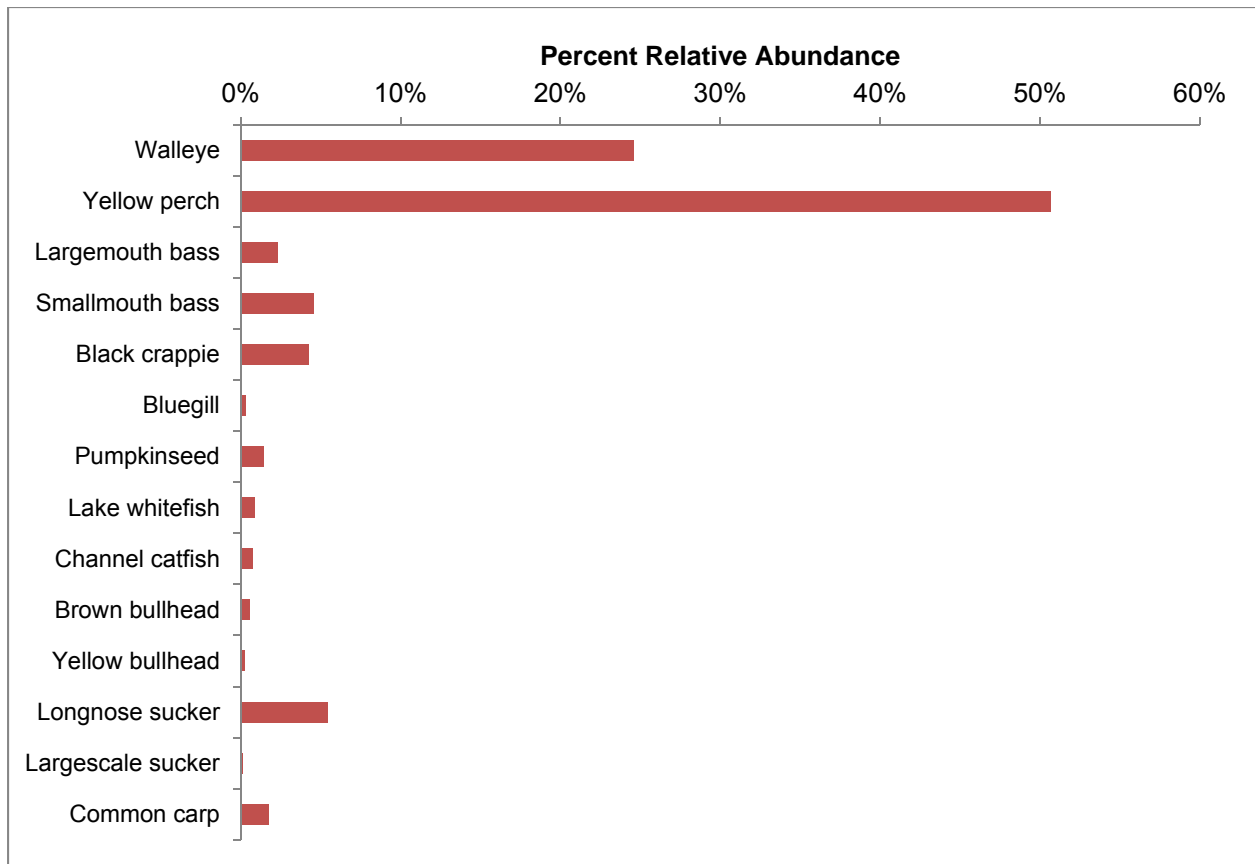
**Figure 24.** Percent length frequency distribution (LFD) of walleye collected during FWIN on Scooteny Reservoir 2011 compared to the average length frequency (ALF) from all FWIN surveys on Scooteny Reservoir from 2002–2011.



**Figure 25.** Age distribution (AD) of walleye collected during FWIN on Scooteny Reservoir in 2011 compared to the average age distribution (AAD) from all FWIN surveys on Scooteny Reservoir from 2002–2011.



**Figure 26.** Length-at-age ( $\pm$  80% CI) of walleye collected during FWIN on Scooteny Reservoir in 2011 compared to the Southern Lakes Average from all FWIN Surveys on Moses Lake, Potholes Reservoir, and Scooteny Reservoir 2002–2011.



**Figure 27.** Relative abundance of fishes collected during FWIN on Scooteny Reservoir in 2011.



## Frequently Asked Questions

Washington Department of Fish and Wildlife fisheries biologists, along with Spokane and Colville tribal biologists have been conducting FWIN surveys on the five lakes mentioned in this report since 2002. Despite the longevity of this project there is a significant amount of misunderstanding concerning what FWIN is, and why the surveys are conducted annually. Below are the most prevalent questions anglers have concerning FWIN.

**Question 1. Are FWIN nets set in the “good locations” to catch the largest number of fish?**

Answer: The FWIN nets are randomly placed in order to reduce any bias that could affect catch rates.

**Question 2. Is WDFW killing too many walleye in Lake X with their nets?**

Answer: In most cases we collect 300 or fewer walleye from each lake. This represents much less than 1% of the entire population of walleye in the lake and is the equivalent of 300 anglers harvesting one more walleye over the course of a year. In addition, natural mortality rates far exceed that of angling mortality and are an indication that these populations can undergo much more harvest.

**Question 3. Is FWIN sampling used to see what the walleye are eating?**

Answer: Our FWIN sampling is conducted to monitor changes in relative abundance of walleye from year to year, walleye growth, condition, and fecundity. While we do get an indication of what walleye are eating while collecting other information we do not make note of it as fish often regurgitate when caught in gill nets and diet information taken from these fish is often unreliable.

If you are interested in volunteer opportunities, have questions about our FWIN surveys or would like additional copies of this report please contact the following regional warmwater fisheries biologists.

### **Lake Roosevelt and Scootenev Reservoir**

Marc Divens or Randall Osborne  
WDFW Region One  
2315 North Discovery Place  
Spokane Valley, WA 99216-1566  
(509) 892-1001

### **Banks Lake, Moses Lake, and Potholes Reservoir**

Marc Petersen or Mike Schmuck  
WDFW Region Two  
1550 Alder Street NW  
Ephrata, WA 98823  
(509) 754-4546 x222 or x227



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