FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME

FISHERY MANAGEMENT ANNUAL REPORT

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2006 Clearwater Region Annual Fishery Management Report

ABSTRACT

This report details the fisheries management activities conducted in the Clearwater Region during the 2006 calendar year. Regional personnel continue to compile 12 years of mountain lake management data into a comprehensive database/management plan. The plan addresses alpine lake management at the landscape level. Fifth and sixth code HUC's were chosen as the landscape scale for management purposes. Brook trout *Salvelinus fontinalis* were removed from the outlet of Ice Lake. Surveys were conducted on Fly, Heather, Platinum, and Running lakes. Tiger muskellunge *Esox lucius* X *E. masquinongy* were stocked into these four lakes and Rainbow Lake to control brook trout populations.

Fishery enhancements were conducted by stocking 5,000 fingerling size kokanee *Oncorhynchus nerka*, 136,932 fingerling size rainbow trout *O. mykiss*, 5,610 fingerling size Westslope cutthroat trout *O. clarkii lewisi*, 279,748 catchable size rainbow trout, and 1,864 catchable size channel catfish *Ictalurus punctatus* in regional lowland lakes and ponds. Clearwater Region fisheries management personnel conducted standard lake surveys on three lowland lakes and reservoirs, plus a standard smallmouth bass *Micropterus dolomieu* survey on Dworshak Reservoir.

Seven children's fishing clinics were held on Free Fishing Day, June 10, 2006. An estimated 389 children and 460 adults attended the events. Several local businesses donated a variety of fishing tackle which was given away as prizes and in "goodie" bags at each event.

Deer Creek Reservoir was renovated using the fish toxicant Synpren (active ingredient is Rotenone) to remove an illegal introduction of golden shiners *Notemigonus crysoleucas*. This project involved the application of approximately 482 gallons of Rotenone to the reservoir, its two tributary streams, and Deer Creek below the dam.

Habitat improvements are being made on Robinson Pond to provide shading and security for juvenile fish and continue to provide an excellent community fishery. The hypolimnetic aeration systems in Waha Lake and Winchester Lake continue to be monitored and maintained.

REGIONAL FISHERIES MANAGEMENT GRANT OBJECTIVES

1. To collect and maintain information for fishery management decisions on mountain lakes, lowland lakes and reservoirs, and rivers and streams including angler use and success, fish population characteristics, spawning potential, stocking success, limnology, morphology, genetics and notes on other aquatic life and develop appropriate management recommendations.

2. To manage wild populations of native and introduced fish to maintain desired sport fishing opportunities, to protect native fish populations and for the collection of brood stock for specific management programs.

3. To improve/restore habitat on degraded streams within Idaho with good potential to enhance wild trout recruitment.

4. To create and improve habitat in reservoirs for sport and forage fish species.

METHODS

Fish community surveys on mountain lakes were performed utilizing gill nets, angling, and standard backpack electrofishing methods. A single 7-panel gill net (mesh sizes 10 mm-38 mm, 40 m long, Research Nets, Seattle, Wa) was set in the lake in early evening. The gill net was removed the next morning after 12 hrs, and all fish collected were measured for length and weight. Fish collected by angling were measured for length and weight, and angling time was recorded in rod-hours.

Backpack electrofishing was conducted with 2-3 person teams. One person operates a Smith Root Model 15D generator powered backpack electrofishing unit and nets fish. The other team member(s) net fish and/or carry a 5-gallon holding bucket. The electrofishing unit is typically operated at the I-5 and O-5 settings at 500-800 volts pulsed DC.

Fish community surveys on lowland lakes and reservoirs were performed using Idaho Department of Fish and Game standard survey protocol. Results were reported in catch-per-unit-effort (CPUE). One “unit” of effort consists of: one hour of boat electrofishing, one floating and one sinking gill net, and one trap net. Boat mounted electrofishing was conducted using pulsed D.C. current from a portable generator and a Coffelt VVP-2E pulsator. Standard floating and sinking experimental gill nets were 45.7 m long by 1.8 m deep with six panels of different size mesh. Mesh sizes were 2.28 cm, 2.54 cm, 3.17 cm, 3.8 cm, 5.1, and 6.35 cm square. Indiana style trap nets consisted of a front box maze of two 1.8 m wide by 1 m high steel frames with center braces and four 76.2 cm diameter hoops with two 20.3 cm throats, and a 15.2 m long x 1 m high leader. Mesh size was 2.28 cm throughout. Fisheries management personnel also utilize these standard electrofishing, trapping, and netting techniques for trapping and transplanting fish.

Lake renovations utilize products containing the active ingredient Rotenone (a fish toxicant). Standard application and safety procedures are found in Finlayson et al. (2000). Potassium permanganate is used for immediate detoxification of the Rotenone.

Mountain Lake Investigations

Regional Objectives

1. Collect biological, physical, and chemical data on regional mountain lakes.
2. Develop long-term data sets for regional mountain lakes.
3. Determine ecological effect of fish introductions.
4. Develop fish management plans for individual lakes.

Methods

Backpack electrofishing was utilized to collect and remove brook trout from the outlet of Ice Lake. Additionally, standard methodology was used to conduct fish surveys on Running, Platinum, Fly, and Heather (2004) lakes to collect information on brook trout populations prior to initial stockings of tiger muskellunge. A Peterson mark-recapture experiment was conducted in Running Lake to develop a population estimate of brook trout in the lake.

Results and Discussion

Fly Lake

A fish survey of Fly Lake was conducted on June 21-22, 2006. This survey consisted of 34 hours of angling and one 12 hour gill net set. A total of 132 brook trout were collected by angling and gill nets. These fish ranged in length from 110 - 309 mm in length. A comparison between length frequency distributions from surveys conducted in 2004 and 2006 is found in Figure 1. On June 30, 2006 a total of 41 tiger muskellunge were stocked into the lake.

Heather Lake

A fish survey of Heather Lake could not be conducted in 2006 due to ice conditions. The most recent survey of the lake was conducted in 2004. A total of 27 brook trout were collected by angling and gill nets. These fish ranged from 102 - 372 mm in length. A comparison between length frequency distributions from surveys conducted in 1998 and 2004 is found in Figure 2. On June 30, 2006 a total of 106 tiger muskellunge were stocked into the lake.

Ice Lake

A brook trout removal project was continued on Ice Creek below Ice Lake on September 16-17, 2006. A total of 632 m of stream was sampled with 20,391s of electrofishing, resulting in the capture and removal of 629 brook trout. These fish ranged in length from 30 - 190mm (Figure 3).

Platinum Lake

A fish survey of Platinum Lake was conducted on June 24-26, 2006. This survey consisted of 30 hours of angling and one 12 hour gill net set. A total of 43 brook trout were collected by angling and gill nets. These fish ranged in length from 128 - 330 mm in length (Figure 4). On June 30, 2006 a total of 40 tiger muskellunge were stocked into the lake.

Rainbow Lake

On June 30, 2006 a total of 177 tiger muskellunge were stocked into the lake.

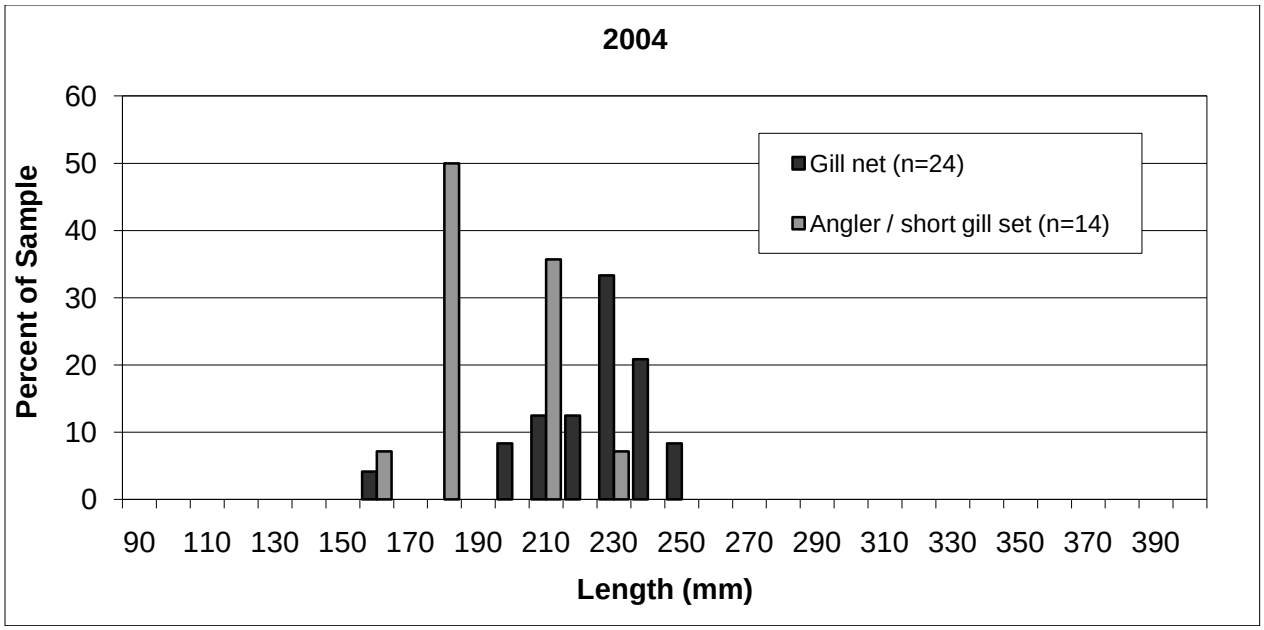
Running Lake

A fish survey of Running Lake was conducted on June 28-30, 2006. A total of 62.5 angler hours resulted in the capture of 390 brook trout. These fish were all marked and released. A 14.5 hour gill net set then resulted in the capture of 77 brook trout, of which eight were recaptures. Overall, 467 brook trout ranging in length from 100 – 225 mm were collected in Running Lake (Figure 5). The population estimate was calculated to be 6,006 fish, however, this estimate may not be reliable due to the low number of fish collected and recaptured compared to the large population size. On June 30, 2006 a total of 334 tiger muskellunge were stocked into the lake.

Management Recommendations

1. Continue annual monitoring of brook trout length-at-age data in Ice Lake and Rainbow Lake to determine long-term effectiveness of tiger muskellunge introductions on controlling brook trout and persistence of tiger muskellunge.

2. Annually monitor brook trout length-at-age data in Running, Platinum, Fly, and Heather lakes to determine effectiveness of tiger muskellunge introductions on controlling brook trout.



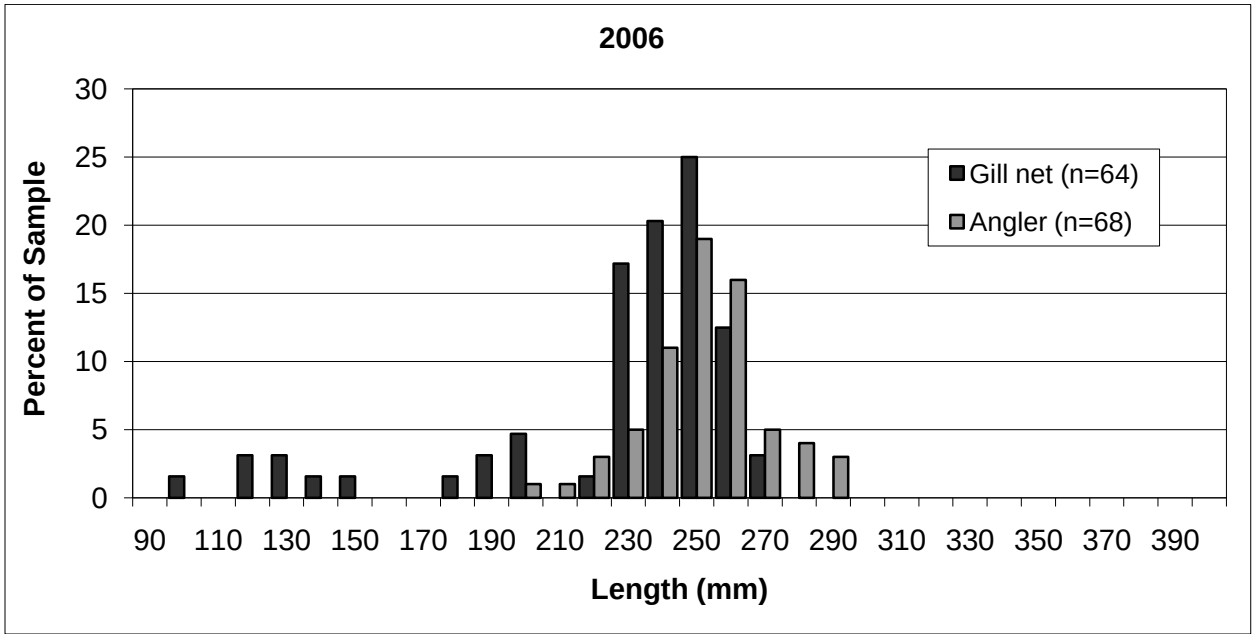


Figure 1. Length frequency distribution of brook trout collected from Fly Lake by IDFG angling and gill nets in 2004 and 2006.

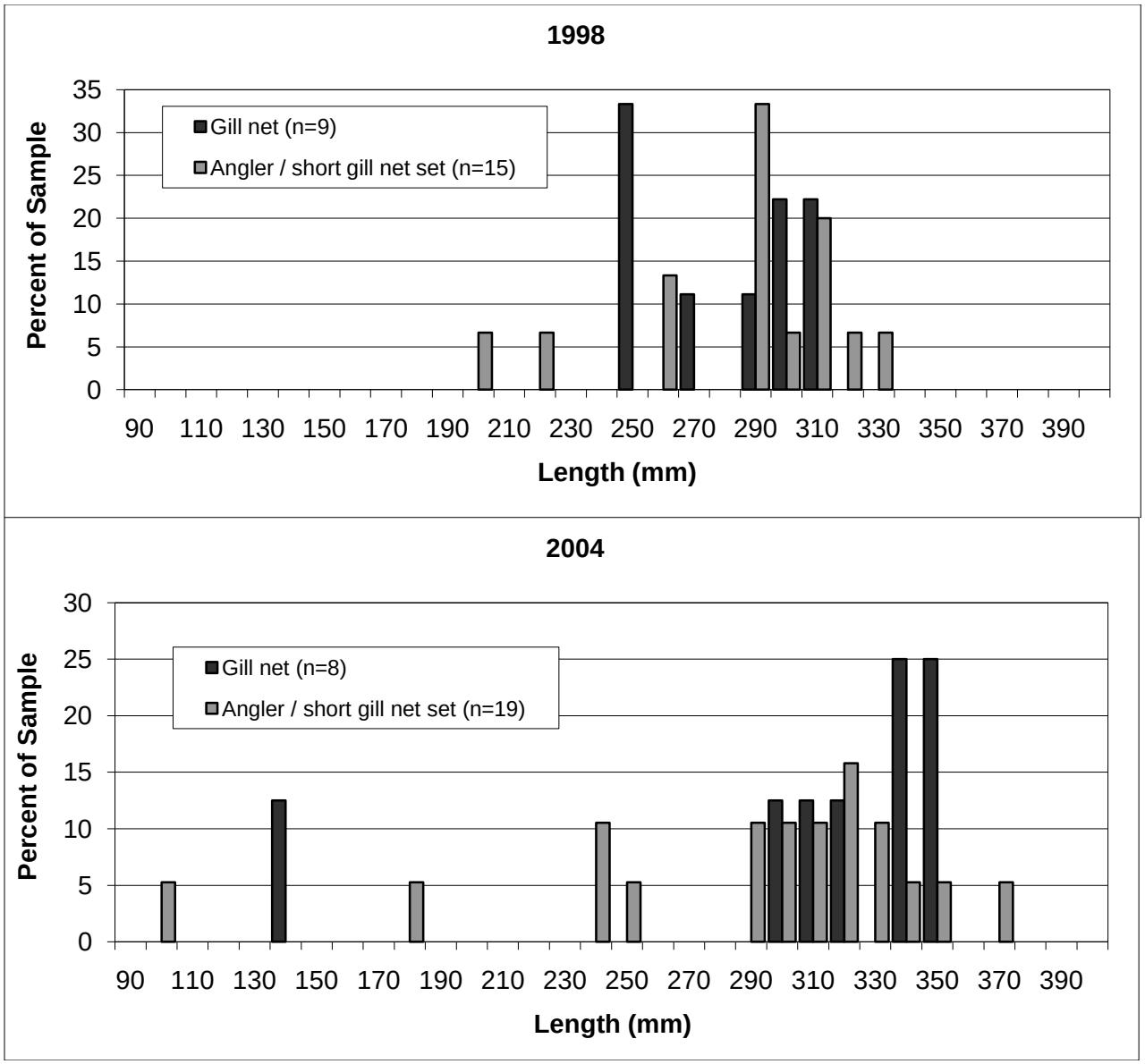


Figure 2. Length frequency distribution of brook trout collected from Heather Lake by IDFG angling and gill nets in 1998 and 2004.

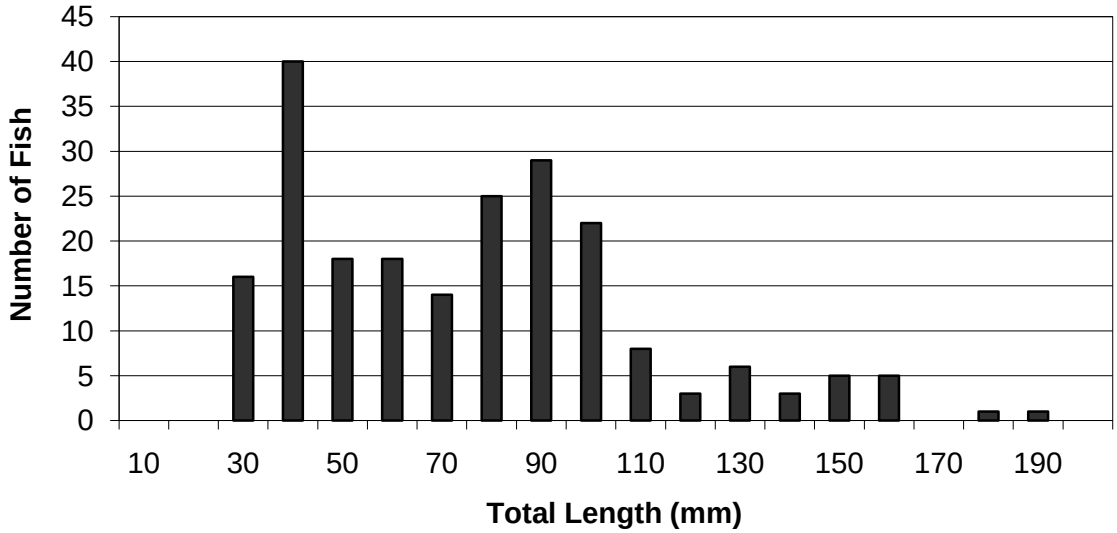


Figure 3. Length frequency distribution of brook trout collected from Ice Creek below Ice Lake by backpack electrofishing on September 16-17, 2006.

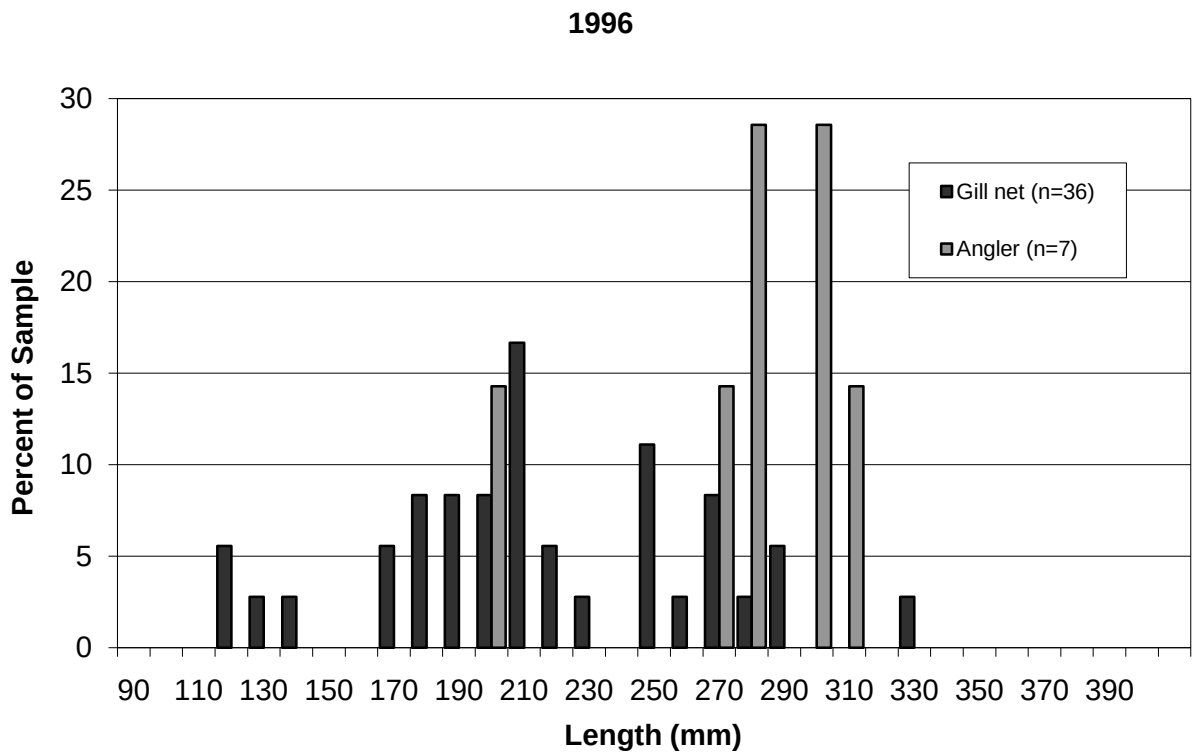


Figure 4. Length frequency distribution of brook trout collected from Platinum Lake by IDFG angling and gill nets in 2006.

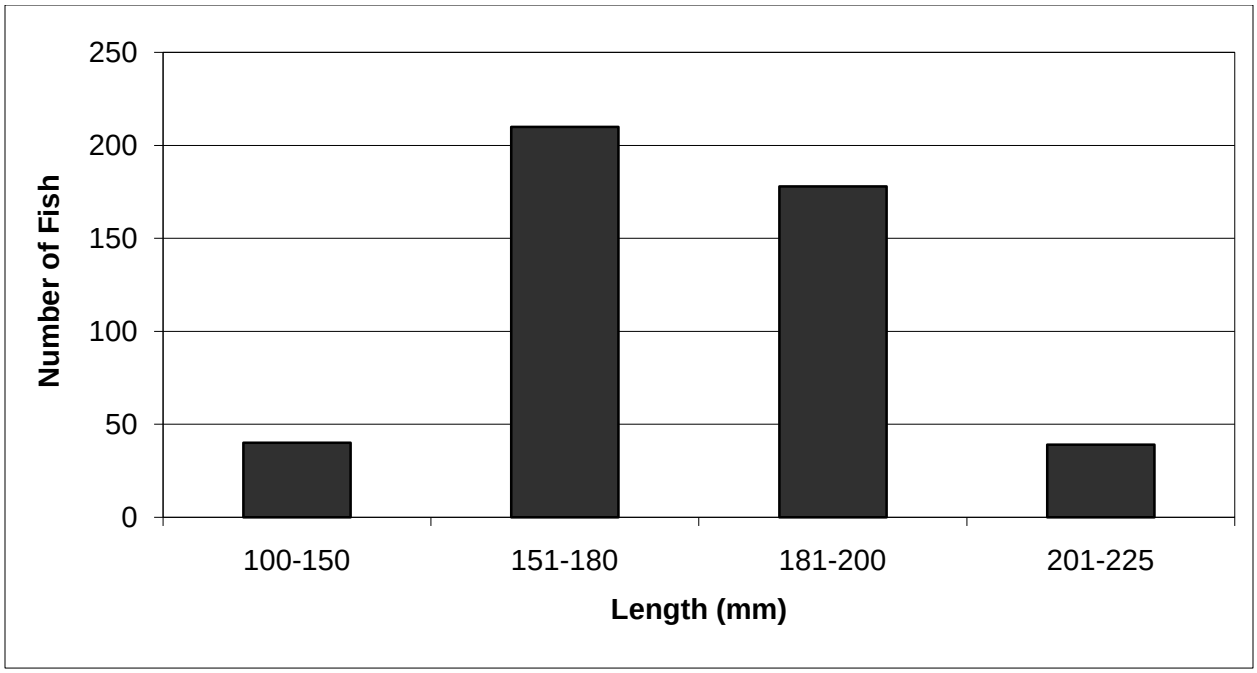


Figure 5. Length frequency distribution of brook trout collected from Running Lake by IDFG angling and gill nets in 2006.

Lowland Lake Investigations

Regional Objectives

1. Utilize hatchery reared fish to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction or excessive fishing pressure or both.

2. Move naturally produced fish from other waters to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction or excessive fishing pressure or both.

3. Control, eradicate or remove undesirable fish from regional waters.

4. Conduct standard lake surveys and creel surveys on lowland lakes and reservoirs to track fisheries composition and catch rate.

Methods

The annual smallmouth bass survey of Dworshak Reservoir consists of electrofishing three shoreline sites in their entirety: Magnus Bay, Swamp Creek bay, and the shoreline beginning directly across from the Dent Boat ramp up to the Dent Bridge. Electrofishing time is recorded for each section, and all fish are weighed (g) and measured for total length (mm).

Standard IDFG methodology was utilized for conducting fish population surveys in regional lowland lakes.

Deer Creek Reservoir was renovated using the fish toxicant Synpren, which contains Rotenone as the active ingredient. The following application methods were used to apply the product: gas powered pumps with sprayers to reach shallow areas, venturi pumps for subsurface application, gas powered pump for deep water application, backpack sprayers to treat wet spots and areas of standing water around the reservoir, and drip stations to treat the tributary streams. Potassium permanganate was used in a drip station below the reservoir to detoxify the discharge/seepage from the reservoir.

Results and Discussion

Fish Stocking and General Population Management

We enhanced resident fish populations and sport fishing in lowland lakes and reservoirs of the Clearwater Region by stocking approximately 136,932 fingerling rainbow trout, 5,610 fingerling Westslope cutthroat trout, and 5,000 fingerling kokanee (Table 1). Lakes, ponds and reservoirs were stocked with 279,748 catchable size rainbow trout (Table 2). Additionally, 1,664 catchable size channel catfish were stocked into Winchester Lake and 200 catchable size channel catfish were stocked into Tolo Lake.

Nine children's fishing clinics were held on Free Fishing Day, June 10, 2006. An estimated 389 children and 460 adults attended the events (Table 3). As part of a new statewide effort to address angler recruitment, a new pilot event was held at Mann Lake. This involved increased advertisement, requests for assistance from local vendors, contests, and educational stations. Contests were held for casting accuracy and biggest fish caught, with

prizes given for 1st-3rd place. The educational stations included Gyotaku fish printing, tanks with live fish, informational posters about fish found in Idaho, and a fish cleaning/cooking station where participants could clean their fish and have them cooked by IDFG personnel. A total of 184 people attended the pilot event, including 82 children. Of those children, 22 were first time anglers.

Deer Creek Reservoir

On August 4, 2006, an illegal introduction of golden shiner was documented in Deer Creek Reservoir. Deer Creek Reservoir is located in Clearwater County near the historic town of Headquarters, Idaho. It is located in the Reeds Creek watershed which flows directly into Dworshak Reservoir. The reservoir was constructed in 2003 and was currently being managed as a trout fishery. Stocked trout grow well, with many in the 381 – 457 mm size range caught in 2005 and 2006. Local public support for Family Fishing Water regulations was overwhelming in the 2006-07 regulation cycle public hearings.

We speculate that golden shiner were either introduced by an angler illegally using live bait or intentionally by an individual attempting to provide forage for other fish. This represents the first known occurrence of golden shiner in Idaho. Golden shiners are omnivorous but feed preferentially on zooplankton and are significant competitors with trout. We believe that they also have the potential to directly compete with kokanee in Dworshak Reservoir. Any potential benefits they may provide as forage for predatory fish are far outweighed by fishery losses via competition with other fish that forage primarily on zooplankton. Eradication of golden shiner from Deer Creek Reservoir is an issue much larger in scope than simply evaluating the management alternatives in this particular reservoir. Persistence of golden shiner in Deer Creek Reservoir will certainly provide a continual source for natural migration to Dworshak Reservoir and a source for additional illegal introduction throughout other area waters.

Golden shiners are capable of multiple spawns within one summer. Sampling in Deer Creek Reservoir on August 21, 2006 produced many (up to 6) distinct size classes of shiners ranging from larval fish to 170 mm. Based on this range of sizes and the very high density we believe that golden shiners have been in the reservoir for more than one year, although none were observed in 2005. It is also hard to speculate that if they were present in the reservoir in 2005 that none were washed over the spillway during times of higher water flows in the spring of 2006. However, sampling in the East Fork of Deer Creek in the mile immediately below the reservoir and in Dworshak Reservoir at the mouth of Reeds Creek, failed to document any golden shiners.

Due to this threat, it was necessary to renovate Deer Creek Reservoir with the fish toxicant Rotenone to eliminate the golden shiner population. The reservoir has a strong thermal stratification and dissolved oxygen levels of less than 0.5 mg/L below five meters of depth. Thus, we determined that it would be feasible to reduce the reservoir's water level by approximately five feet with very little chance of entraining golden shiners. This would reduce the volume of water to be treated from 1,294.5 ha/m to 913.5 ha/m (29%). In addition, this would provide a safety margin in the event of substantial rainfall which, if the reservoir was full, would cause the treated water to exit the reservoir, killing fish downstream. Beginning on August 23rd we increased the outflow through the bottom drain with a goal of dropping the water level approximately 10.2 cm per day until we reach the goal of 152 cm. The reservoir was monitored twice daily to ensure that the discharge rate was not sufficient to destratify the reservoir. The effluent was also monitored to ensure no fish were being entrained. On

September 10th the reservoir had dropped 165.1 cm and the drain was shut. The temperature and dissolved oxygen profiles on September 12th are shown in Figure 6.

Several additional treatment options were considered, including treatment of the full volume and the treatment/detoxification of effluent as the reservoir is drawn down. We determined that dropping the reservoir level, then treating the closed reservoir was risk averse, using existing environmental conditions to limit potential spread of golden shiners while reducing the reservoir volume enough to facilitate a contained rotenone treatment. We concluded that treating and detoxifying the reservoir effluent had higher environmental risk than was presented by limited hypolimnetic withdrawal, especially considering that it is likely that golden shiners may already have escaped the confines of Deer Creek Reservoir.

The work crew arrived at Deer Creek Reservoir on September 13th to set up equipment and prepare for the treatment. A first aid station was set up, boats were launched, and all equipment was checked and prepared for service. Two Rotenone drip stations were set up, one on each of the two tributary streams. The station on the main tributary stream consisted of a 113. 5 L barrel holding 2.6 L of Rotenone and topped off with water. The drip head was rated at 179 mL/min. The station on the secondary tributary stream consisted of a 113.5 L barrel holding 1.2 L of Rotenone and topped off with water. The drip head was rated at 211 mL/min. These barrels were left in an upright position to be deployed at the beginning of the treatment on September 14th.

On the morning of September 14th the crew was assembled for a safety and training session. All personnel involved in the application were outfitted with chemical suits, respirators with organic vapor cartridges, goggles/face shields, rubber boots, and nitrile gloves. The openings between the gloves/boots and chemical suits were taped shut. Personnel were then divided into teams of two, each with specific duties: two boats utilizing gas powered pump sprayers to apply the product to shallow areas of the reservoir, one boat utilizing a gas powered pump to deliver the product to deeper water via a perforated weighted hose, one boat utilizing a Venturi pump to deliver product subsurface, and three teams using backpack sprayers to treat any pools of water/wet spots/etc. around the edge of the lake that the boat sprayers could not reach and Deer Creek below the reservoir.

At approximately 9:30 am the treatment began with the deployment of the drip stations and the subsequent deployment of the above-mentioned crews. The treatment went very well despite several equipment malfunctions that delayed the spray boats for about one hour. Additionally, the shallow area at the upper end of the reservoir was much larger than anticipated, therefore, the spray boats took much longer than expected to complete their work. The backpack spray crews checked the entire perimeter of the reservoir and treated any water they found, especially in the mud flats at the upper end of the reservoir where the water drawn down had left numerous pools and wet spots. In mid-afternoon, one backpack spray team was utilized to treat Deer Creek below the dam to check for golden shiners. Additionally, the small settling pond by the boat ramp was treated. A detoxification station, consisting of a 113 L barrel with 3.74 kg of potassium permanganate and filled with water was deployed below the treatment area to detoxify the small amount of effluent and seepage and prevent unwanted downstream effects. The drip head on this station was rated at 171 mL/min. The treatment was completed by 6:00 pm. Approximately 1,824 L of Rotenone were applied to the reservoir, tributary streams and the upper portion of Deer Creek below the reservoir.

On September 15th the crew began the clean-up process. The Rotenone barrels, including those used as drip stations were properly rinsed and resealed. All application

equipment was rinsed, all disposable safety equipment was secured in bags, and reusable safety equipment was boxed up for transport back to the regional office for cleaning. Dr. Scarnecchia's Fisheries Management class from the University of Idaho conducted estimates of number of fish and biomass that was killed by the treatment. We then collected as many of the dead fish as possible for disposal at the Clearwater Fish Hatchery. In mid-afternoon we deployed a large detoxification drip station below the reservoir on Deer Creek 45.7 m upstream from its confluence with Reeds Creek. The drip station was an approximately 473 L tank with 22.7 kg of potassium permanganate topped off with water. The drip head was rated at 171 mL/min. This detoxification station was run continuously until September 22nd, when it was removed. On September 19th an additional detoxification station was deployed just below the Deer Creek Reservoir dam. This consisted of a 1,325.4 L tank with 11.3 kg of potassium permanganate topped off with water. This station was run continuously until the Rotenone levels in the reservoir were no longer toxic to rainbow trout (approximately mid-October). In late October, once the Rotenone has detoxified naturally in the reservoir, we restocked approximately 7,500 catchable-size rainbow trout.

Dworshak Reservoir

An annual smallmouth bass monitoring survey was conducted on Dworshak Reservoir from June 8-10, 2006. A total of 132 smallmouth bass were collected in 19,129 seconds of electrofishing. Poor weather and visibility, and consistent rain throughout the survey reduced sampling efficiency and were definite factors in the lower number of fish collected. However, this is the most smallmouth bass collected since 2003 (Figure 7). The fish collected ranged in length from 80 - 500 mm (Figure 8). The average size of fish appears to be smaller in 2006 than in 2004 and 2005; however, there was a much larger range of sizes collected in 2006. In fact, the 477 mm and 500 mm fish were the two largest smallmouth bass ever collected during this annual survey. Smallmouth bass proportional stock density (PSD; Gablehouse, 1983) was 33.3 in 2006, the highest level recorded during the survey (Figure 9).

Elk Creek Reservoir

Clearwater Region fisheries management personnel conducted a standard lake survey of Elk Creek Reservoir on May 30, 2006. This survey resulted in the capture of 576 fish, including smallmouth bass (N = 60), largemouth bass *M. salmoides* (N = 29), black crappie *Pomoxis nigromaculatus* (N = 183), pumpkinseed *Lepomis gibbosus* (N = 273), black bullhead *Ameiurus nebulosus* (N = 22), bluegill *L. macrochirus* (N = 4), and brook trout (N = 5). A comparison of catch-per-unit-effort (CPUE) and percent composition between samples collected in 1997, 2001, 2005, and 2006 are shown in Figures 10 and 11, respectively. The smallmouth bass length frequency shows a shift toward larger fish over the last two samples, with numerous fish over 300 mm (Figure 12). There were no smallmouth bass collected over 300 mm in the 1997 and 2001 samples. The largemouth bass collected were 50 – 380 mm in length, with the majority of the fish in the 225 - 350 mm range (Figure 13). Black crappie and pumpkinseed numbers continue to increase, with these two species accounting for 76.2% (by number) of the fish collected in 2006. Similarly to smallmouth bass, black crappie also had a shift in size structure toward larger fish. Black crappie length frequency distribution shows no age-0 fish. Only adult fish were collected in this year's sample (Figure 14). Even though pumpkinseed numbers have increased, their length frequency distribution has stayed relatively constant over time, with fish collected this year ranging in length from 50 - 180 mm (Figure 15). Black bullhead numbers and their length frequency distribution have stayed fairly constant over the last three surveys (Figure 16). Bluegill were collected again in low numbers. They ranged in length from 50 - 110 mm (Figure 17). As in 2005, substantially fewer brook trout were collected in 2006

than in previous samples. The five fish collected ranged from 210 – 330 mm in length (Figure 18).

Moose Creek Reservoir

Clearwater Region fisheries management personnel conducted a standard lake survey of Moose Creek Reservoir on May 31, 2006. This survey resulted in the capture of 605 fish, including largemouth bass (N = 85), bluegill (N = 442), black crappie (N = 15), pumpkinseed (N = 62), and black bullhead (N = 1). A comparison of catch per unit effort and percent composition between samples collected in 2001 and 2004 - 2006 are shown in Figures 19 and 20, respectively. Largemouth bass length frequency distribution was very similar to that of 2005, with fish ranging from 100 – 500 mm (Figure 21). Substantially more bluegill were collected in 2006 than in previous years, accounting for 73.1% of the fish collected by number. Bluegill length frequency distribution was fairly similar to previous years, but there was a wider range of sizes seen with fish ranging from 40 – 220 mm in length (Figure 22). Black crappie numbers continued to stay low, with a few smaller fish collected (Figure 23). Pumpkinseed numbers increased substantially in 2006 over previous samples; which indicates they are well established in the reservoir. Further evidence to support this conclusion is a wider range of sizes collected (60 -160 mm) than in previous years (Figure 24).

Spring Valley Reservoir

Clearwater Region fisheries management personnel conducted a standard lake survey of Spring Valley Reservoir on June 1, 2006. This survey resulted in the capture of 1377 fish including largemouth bass (N = 168), bluegill (N = 1037), and black crappie (N = 172). A comparison of CPUE and percent composition between samples collected in 1997, 2001, 2004, and 2006 are shown in Figures 25 and 26, respectively. Comparing CPUE, the number of largemouth bass collected in 2006 was the lowest since 1996. The length frequency distribution shows that most of the largemouth bass collected in 2006 were in the 100 – 200 mm range, however, fish were collected in almost every length group up to 480 mm (Figure 27). This is somewhat similar to length frequency distribution seen in 2004. The number of bluegill collected in 2006 is twice the number collected in any other survey. However, a comparison of length frequency distributions shows a shift towards smaller fish as compared to the 2004 sample (Figure 28). The number of black crappie collected continues to increase, with three times the number collected in 2006 as in 2004. Additionally, these fish ranged in length from 150 – 280 mm (Figure 29), a significant shift in size toward larger fish. This is all an indication that black crappie are establishing a legitimate population in Spring Valley Reservoir.

Management Recommendations

1. Continue three year rotation of lowland lake surveys and collection of monthly D.O/temperature profiles on waters sampled in 2006.

2. Conduct quarterly observations of Deer Creek Reservoir to check for re-establishment of golden shiners.

3. If golden shiners persist in Deer Creek Reservoir, the implementation of biological control utilizing a predator such as smallmouth bass or Eagle Lake rainbow trout should be considered. If smallmouth bass are used, they should be collected from Dworshak Reservoir.

Table 1. Fingerling rainbow trout, kokanee, and Westslope cutthroat trout stocked in the lowland lakes and reservoirs of the Clearwater Region, 2006.

Water	Month	Rainbow trout	Kokanee	Cutthroat trout	Total
Deer Creek Reservoir	May			5,610	5,610
Mann Lake	May	29,988			29,988
Soldiers Meadow Reservoir	May	25,440			25,440
Spring Valley Reservoir	May	29,988			29,988
Waha Lake	June		5,000		5,000
Winchester Lake	May	51,516			51,516
Total		136,932	5,000	5,610	147,542

Table 2. Catchable size trout stocked in lakes, ponds, and reservoirs of the Clearwater Region, 2006.

Water	April	May	June	July	August	September	October	Total
Camp Grizzly Pond			1,222					1,222
Campbells Pond		4,000	2,000		900			6,900
Deer Creek Reservoir		12,500	7,689				3,400	23,589
Dworshak Reservoir		22,625	37,120					59,745
Elk Creek Reservoir		7,500	7,475		12,000			26,975
Fenn Pond		1,000	1,000			500		2,500
Five Mile Pond		500	523		900			1,923
Henrys Gulch Pond			1,000					1,000
Hordeman Pond	718							718
Karolyns Pond		500	1,552		900			2,952
Levee Pond	418	401	210					1,029
Mann Lake	9,000	12,640					10,920	32,560
Moose Creek Reservoir	8,100		12,947				6,240	27,287
Powell Pond		2,000	499					2,499
Robinson Pond								0
Soldiers Meadow Reservoir		9,800						9,800
Spring Valley Reservoir	10,800	14,700	563				6,240	32,303
Waha Lake		7,425						7,425
Wilkins Pond			301					301
Winchester Lake	12,000	9,600	7,020				10,400	39,020
Total	41,036	105,191	81,121	0	14,700	500	37,200	279,748

Table 3. Number of participants at seven Free Fishing Day events held on June 10, 2006.

	2006 participants		
LOCATION	kids	adults	total
Mann Lake	92	92	184
Spring Valley Res.	150	200	350
Deer Creek Reservoir	20	30	50
Karolyn's Pond	30	40	70
Fenn Pond	25	10	35
Long Gulch	12	8	20
Wilkin's Pond	60	80	140
Total	389	460	849

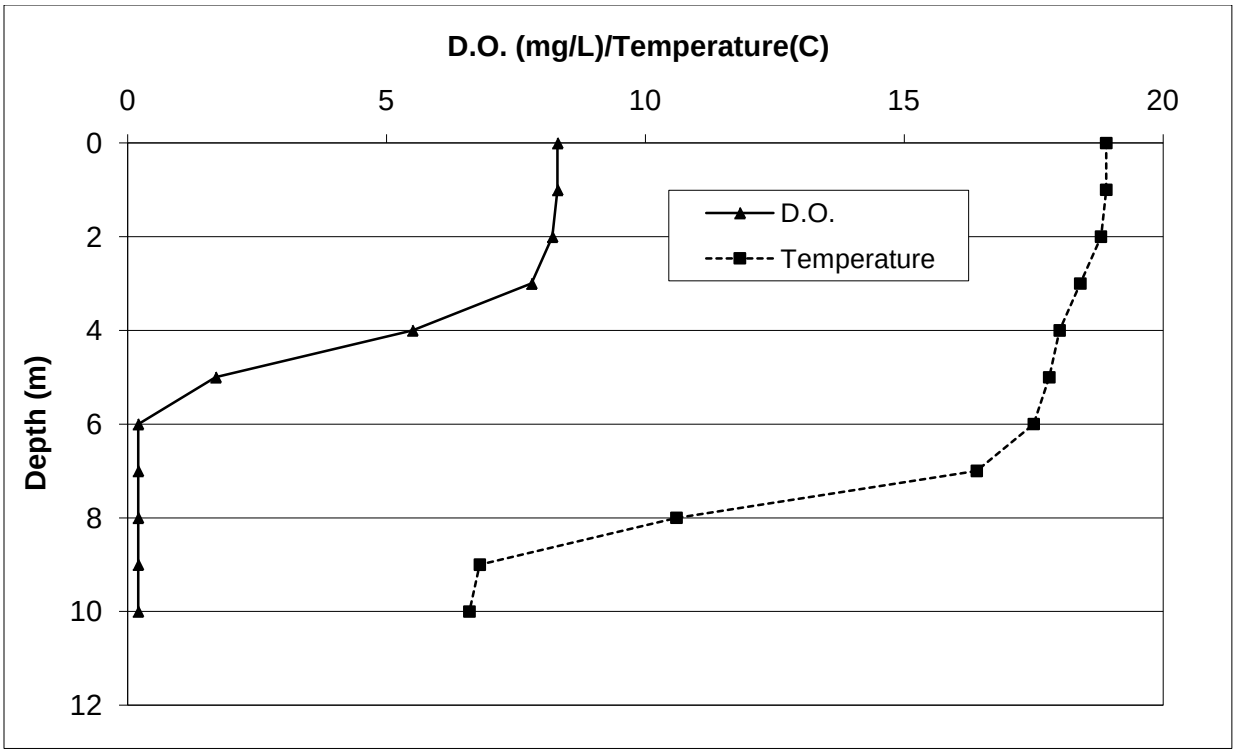


Figure 6. Dissolved oxygen and temperature profiles for Deer Creek Reservoir on September 12, 2006, two days before the Rotenone treatment.

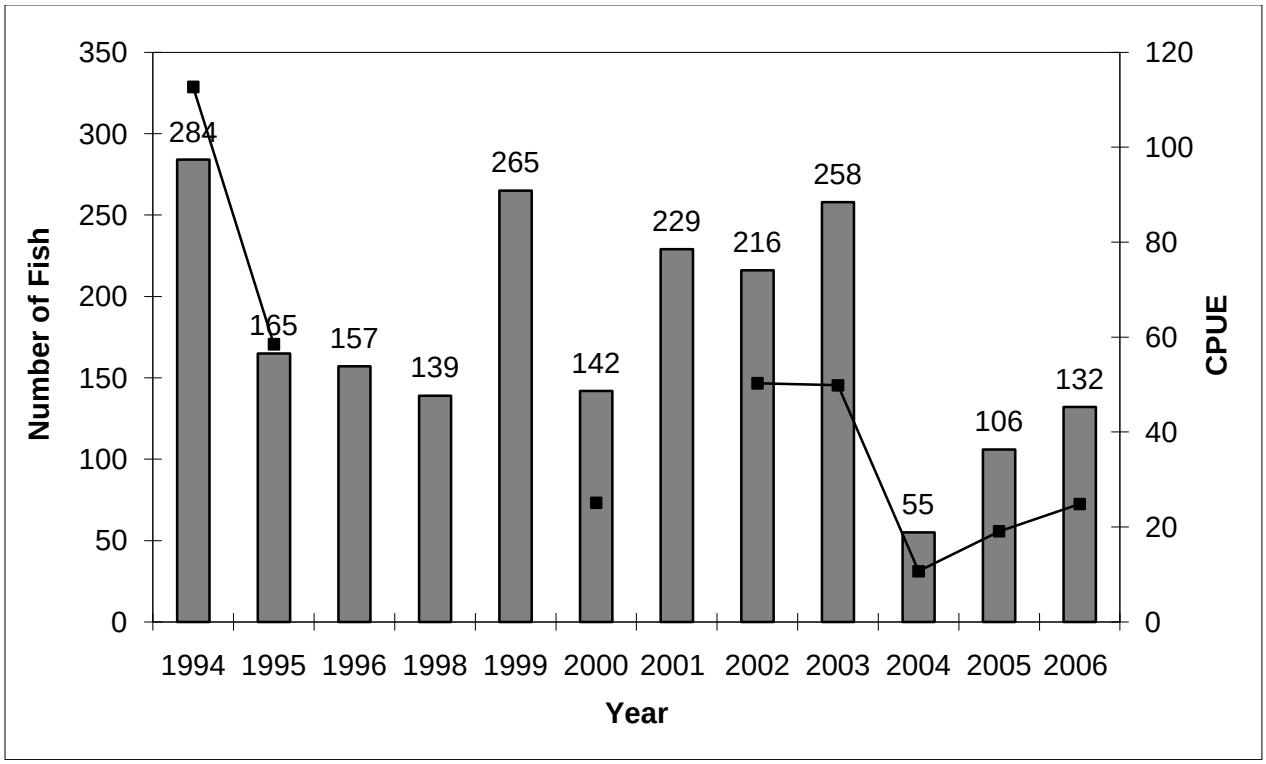


Figure 7. Number and catch per unit effort (CPUE) of smallmouth bass collected during annual population surveys of Dworshak Reservoir, 1994-2006 (N values shown).

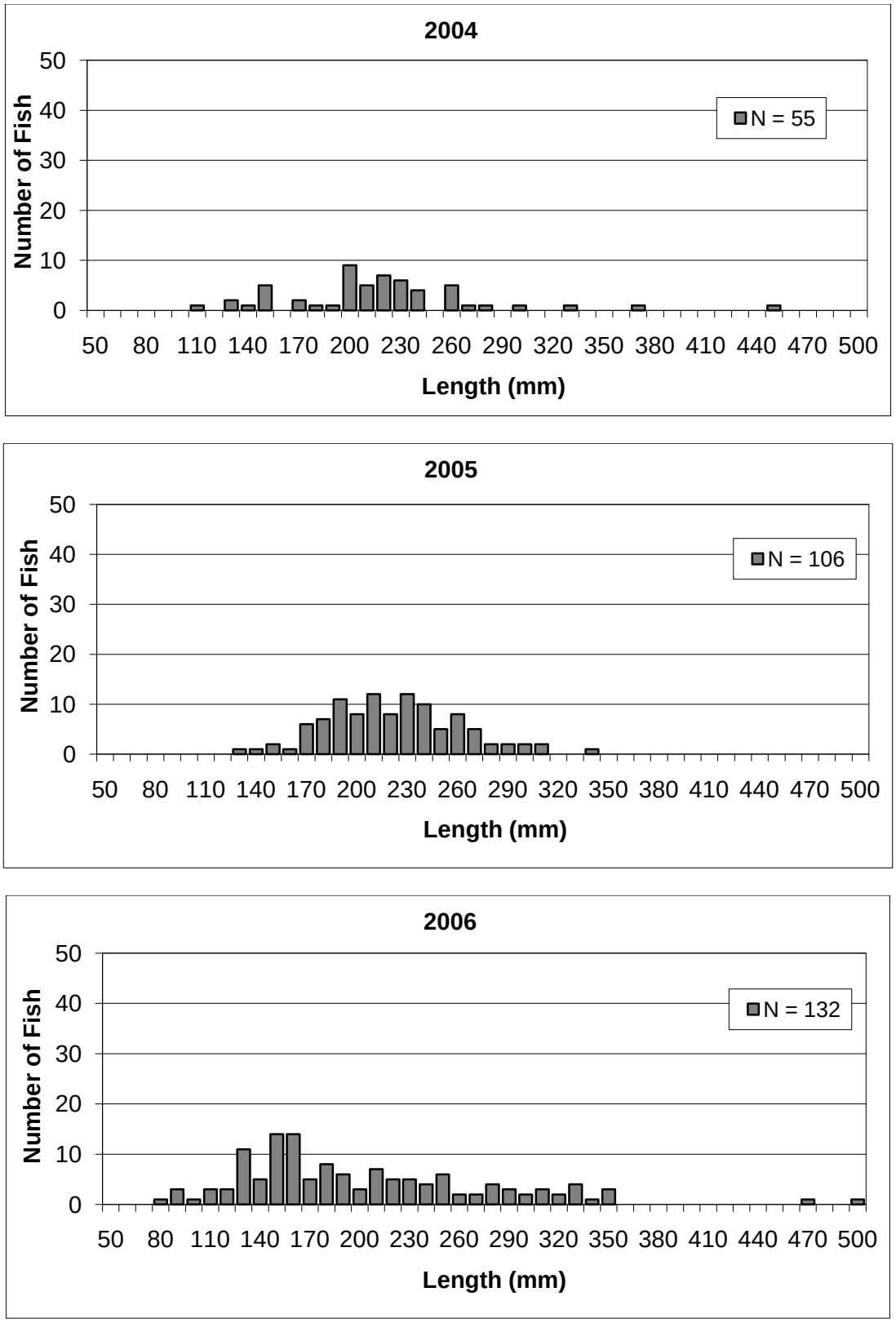


Figure 8. Length frequency distributions of smallmouth bass collected during annual population surveys of Dworshak Reservoir, 2004-2006.

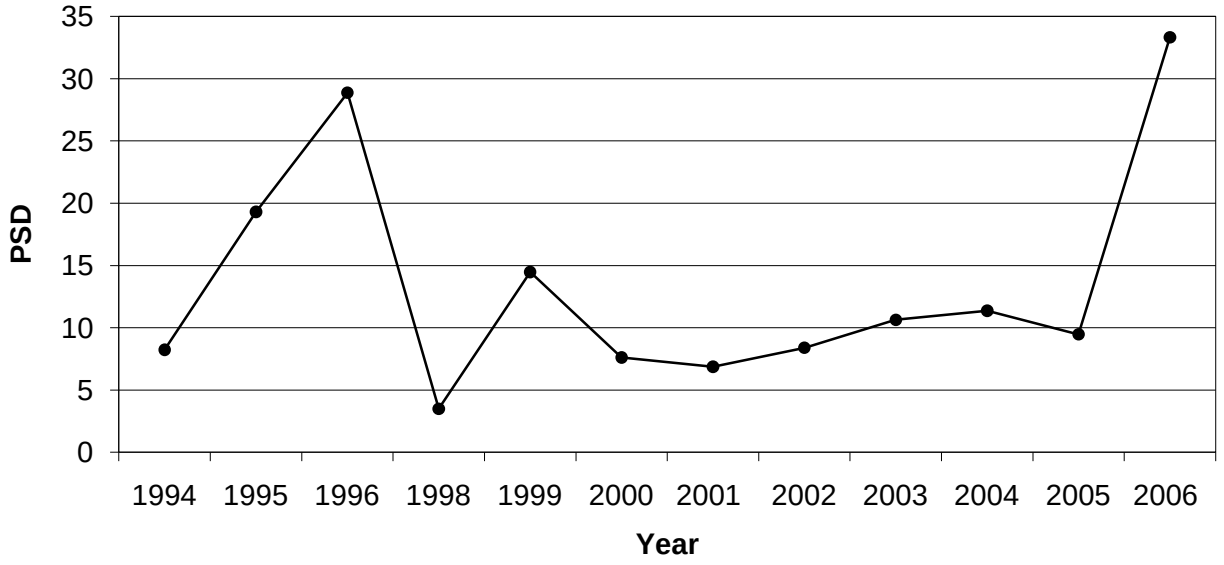
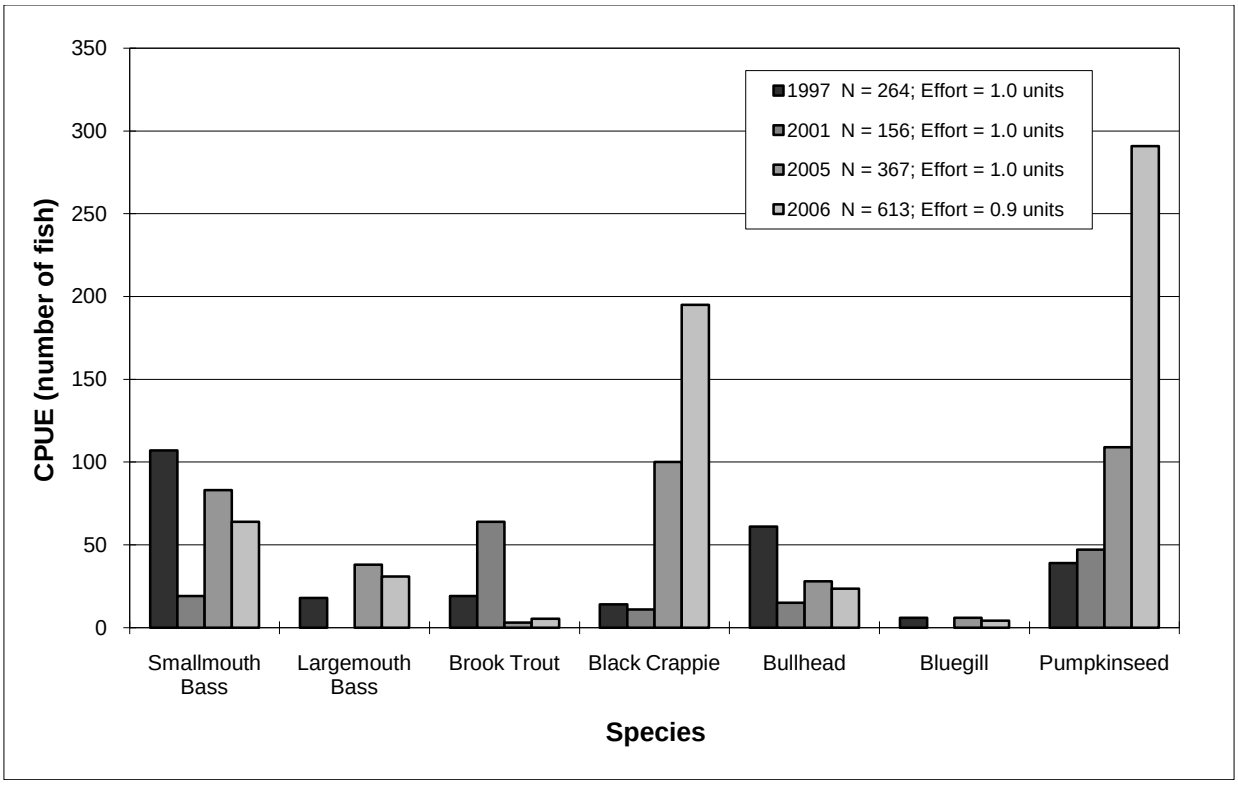


Figure 9. Proportional stock density (PSD) values of smallmouth bass collected during annual population surveys of Dworshak Reservoir, 1994-2006.



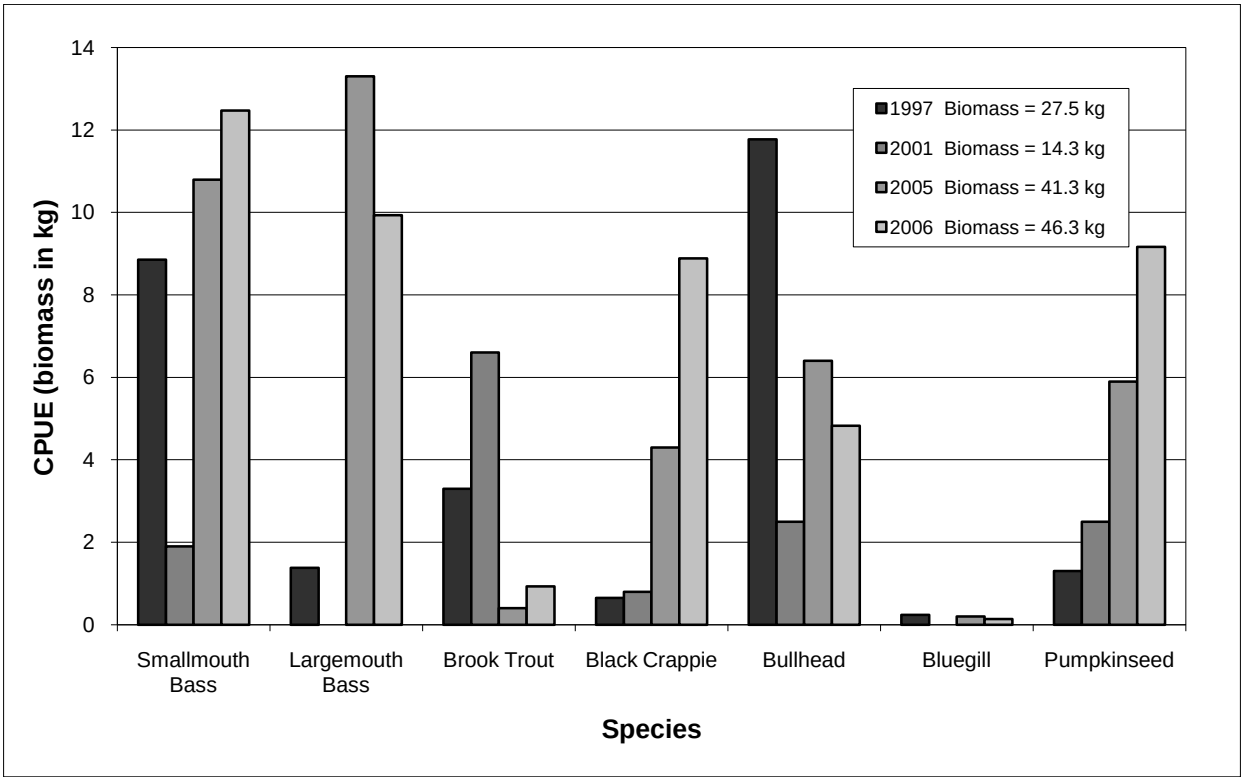
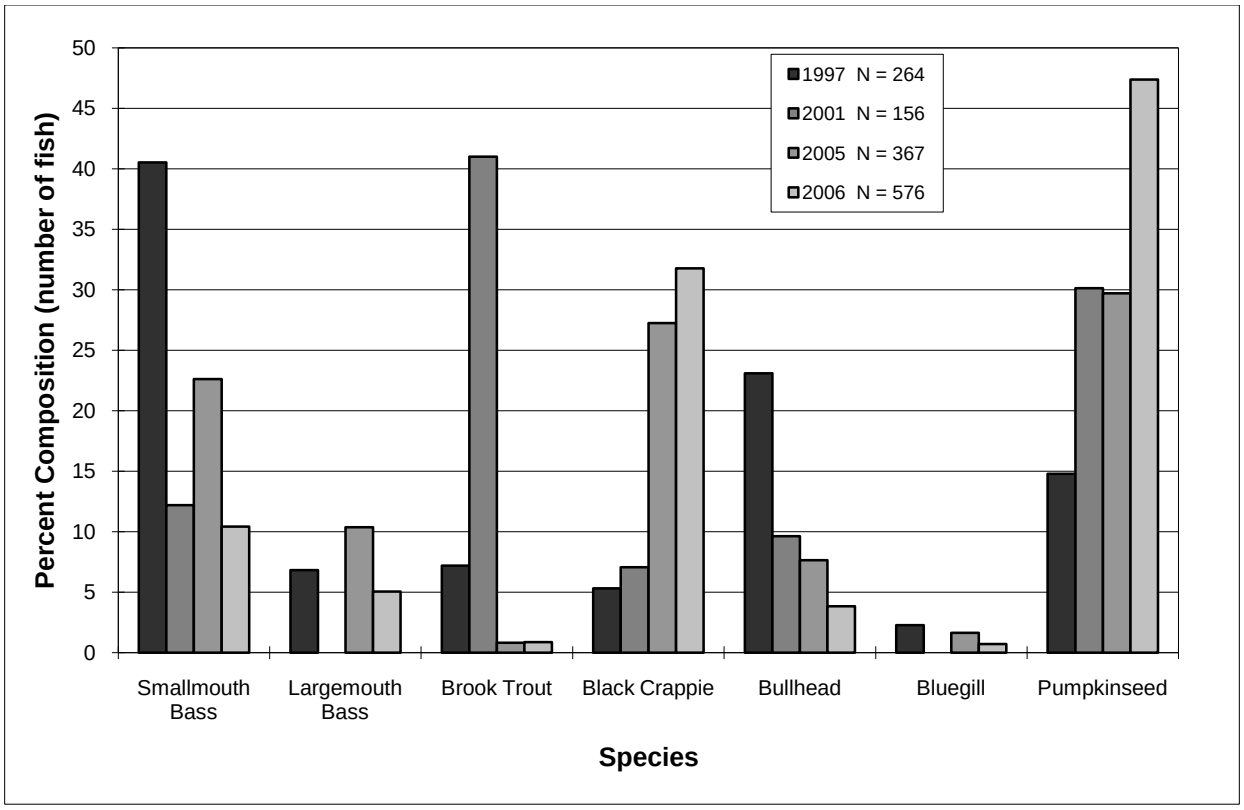


Figure 10. Catch per unit effort (CPUE) of fish collected from standard lake surveys of Elk Creek Reservoir in 1997, 2001, 2005, and 2006, by number of fish and biomass.



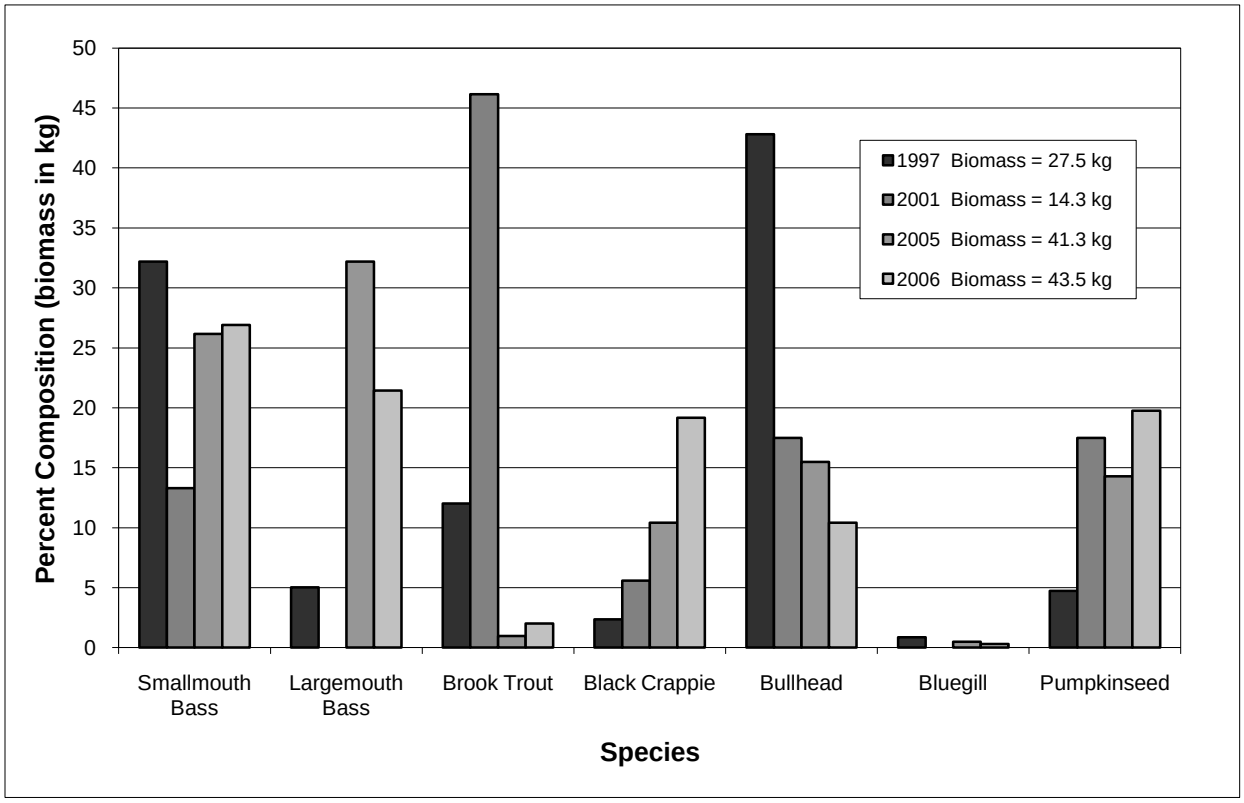


Figure 11. Percent composition of fish collected from standard lake surveys of Elk Creek Reservoir in 1997, 2001, 2005, and 2006, by number of fish and biomass.

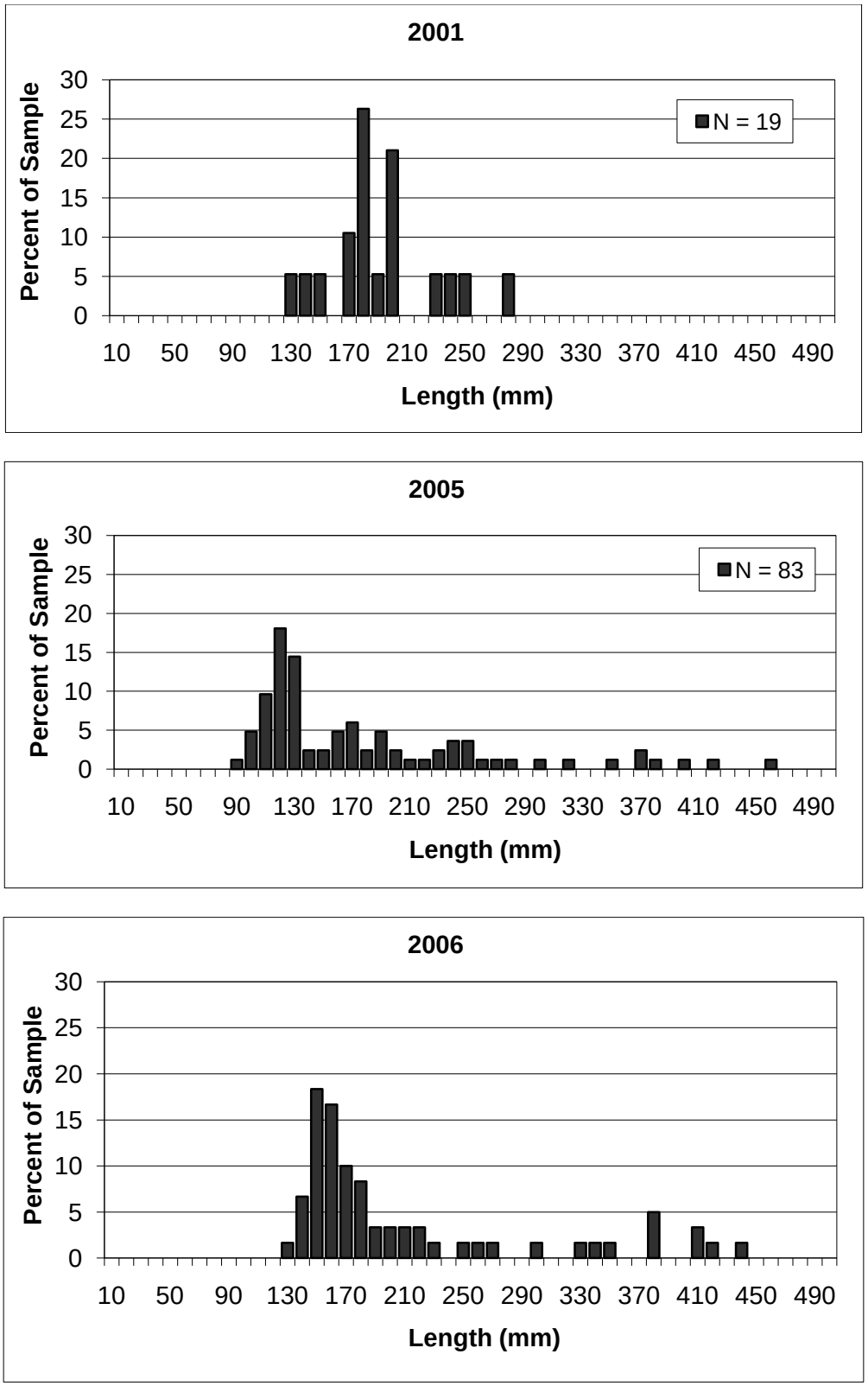


Figure 12. Length frequency distributions of smallmouth bass collected from standard lake surveys of Elk Creek Reservoir in 2001, 2005, and 2006.

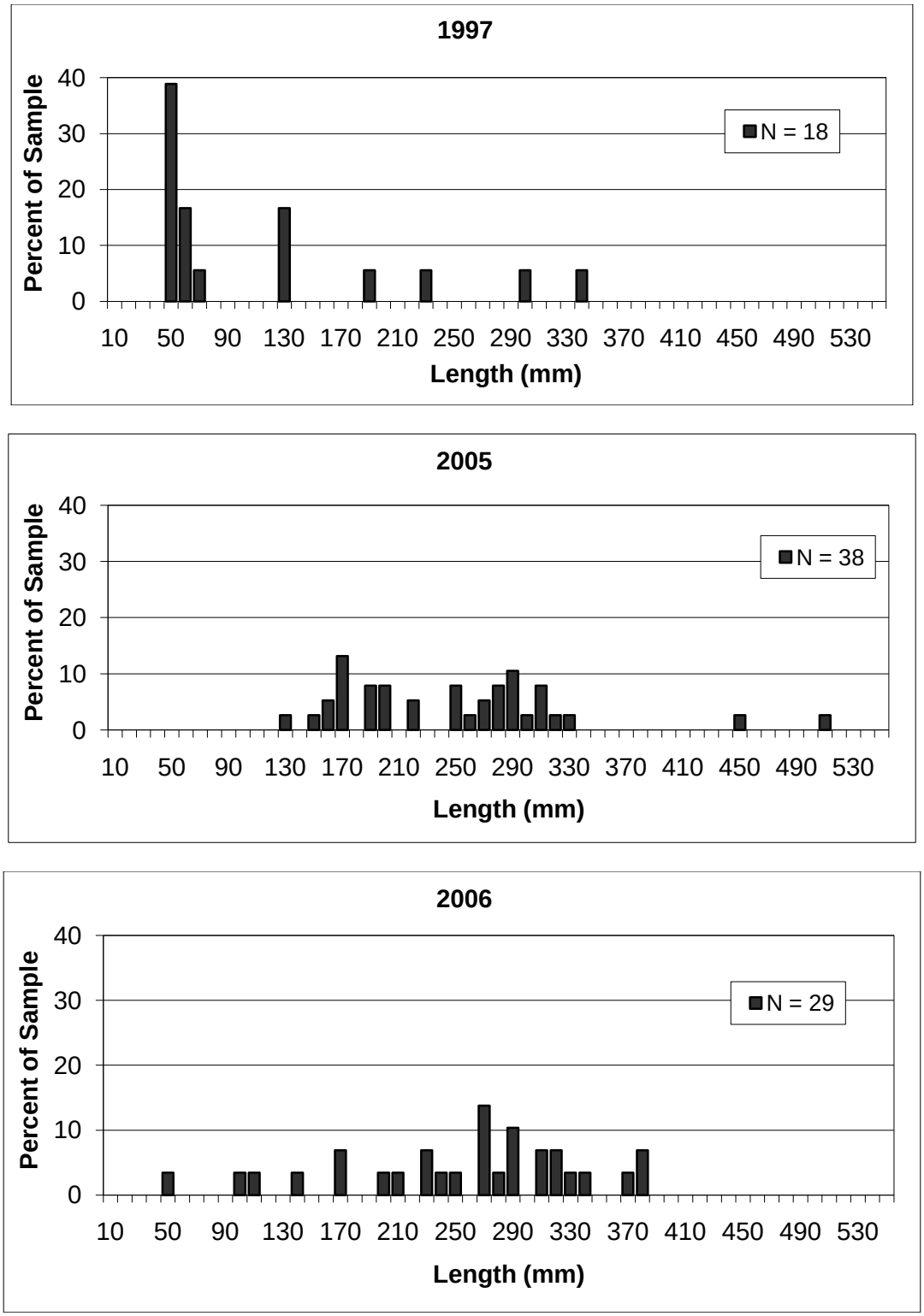


Figure 13. Length frequency distributions of largemouth bass collected from standard lake surveys of Elk Creek Reservoir in 1997, 2005, and 2006.

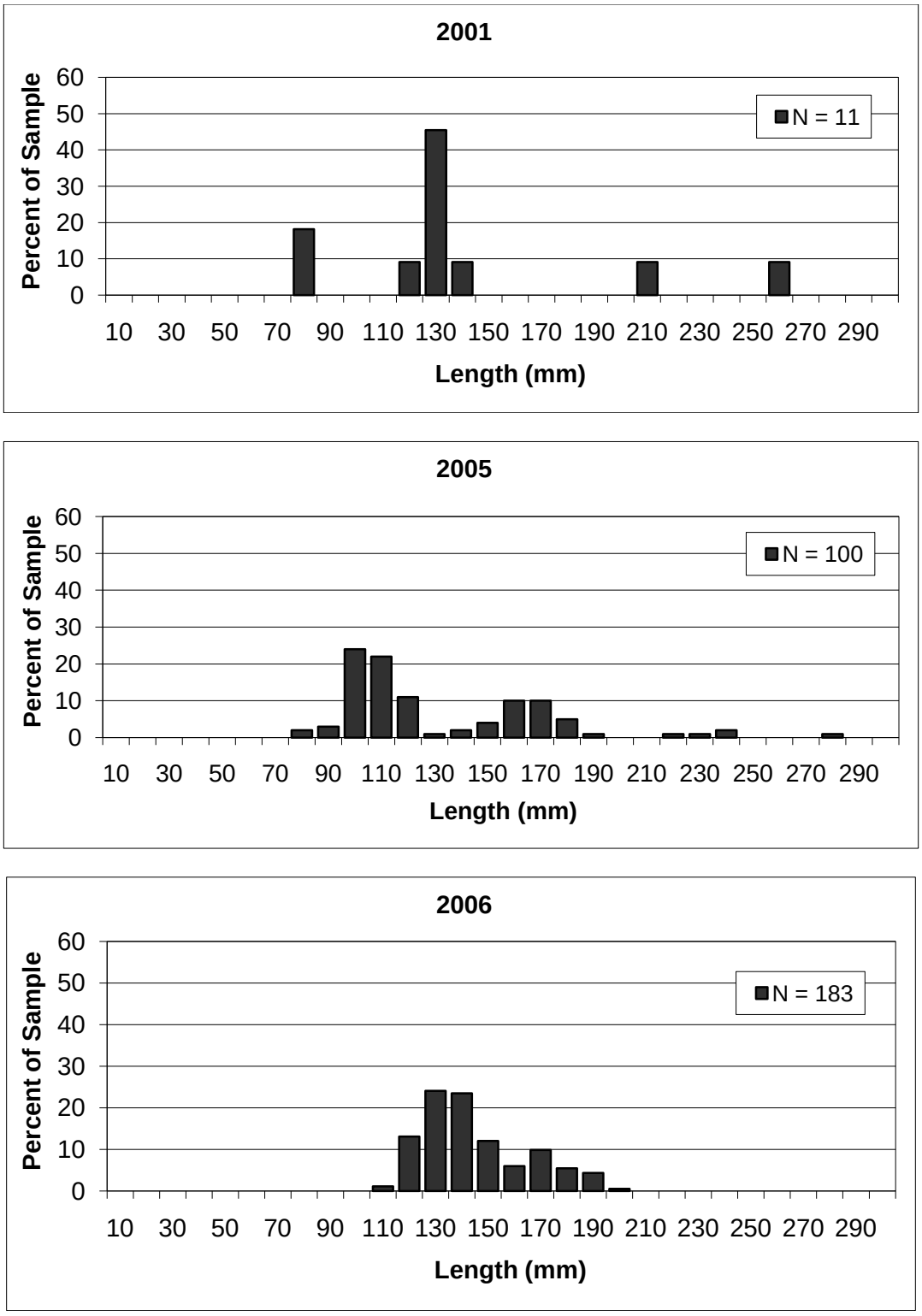


Figure 14. Length frequency distributions of black crappie collected from standard lake surveys of Elk Creek Reservoir in 2001, 2005, and 2006.

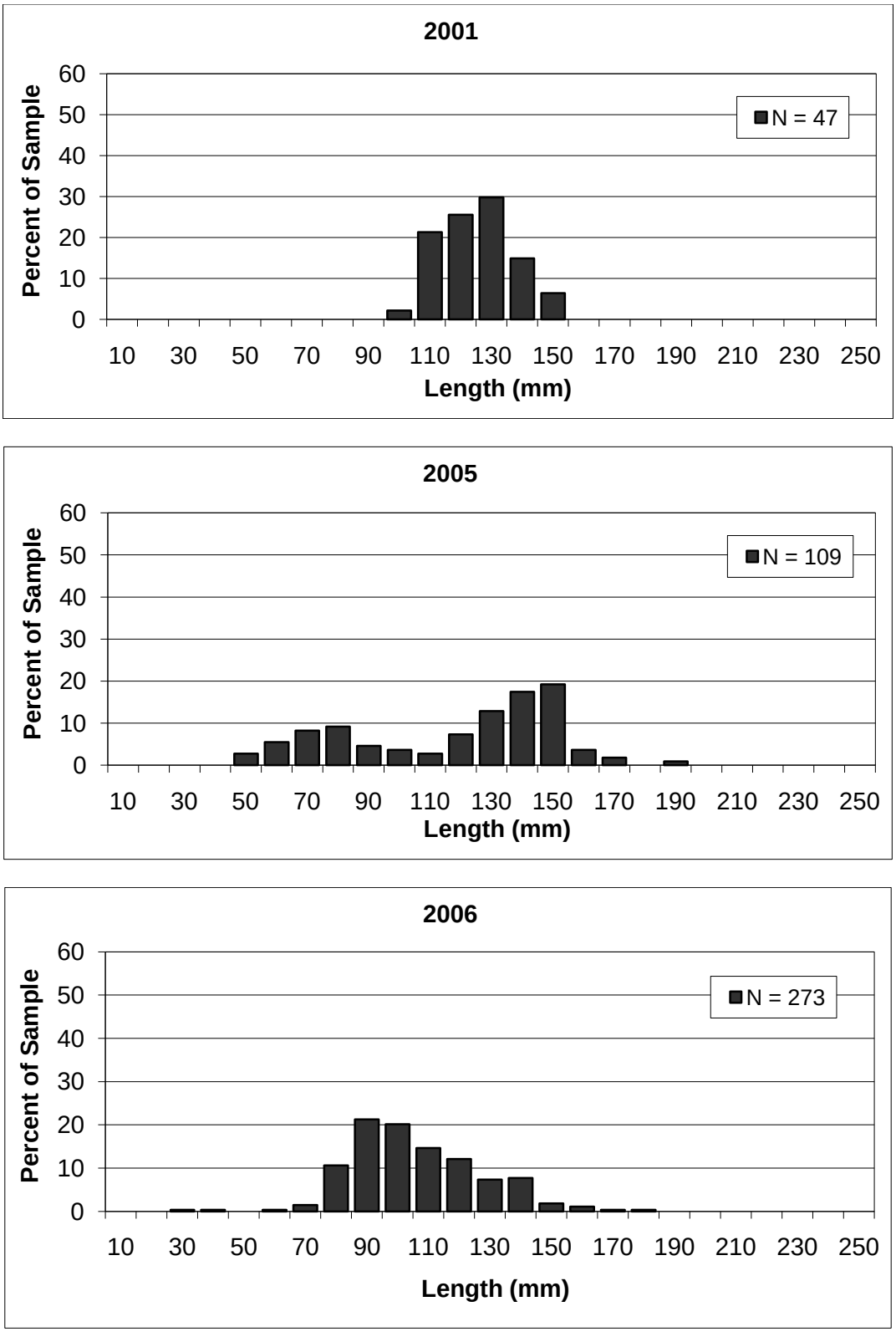


Figure 15. Length frequency distributions of pumpkinseed collected from standard lake surveys of Elk Creek Reservoir in 2001, 2005, and 2006.

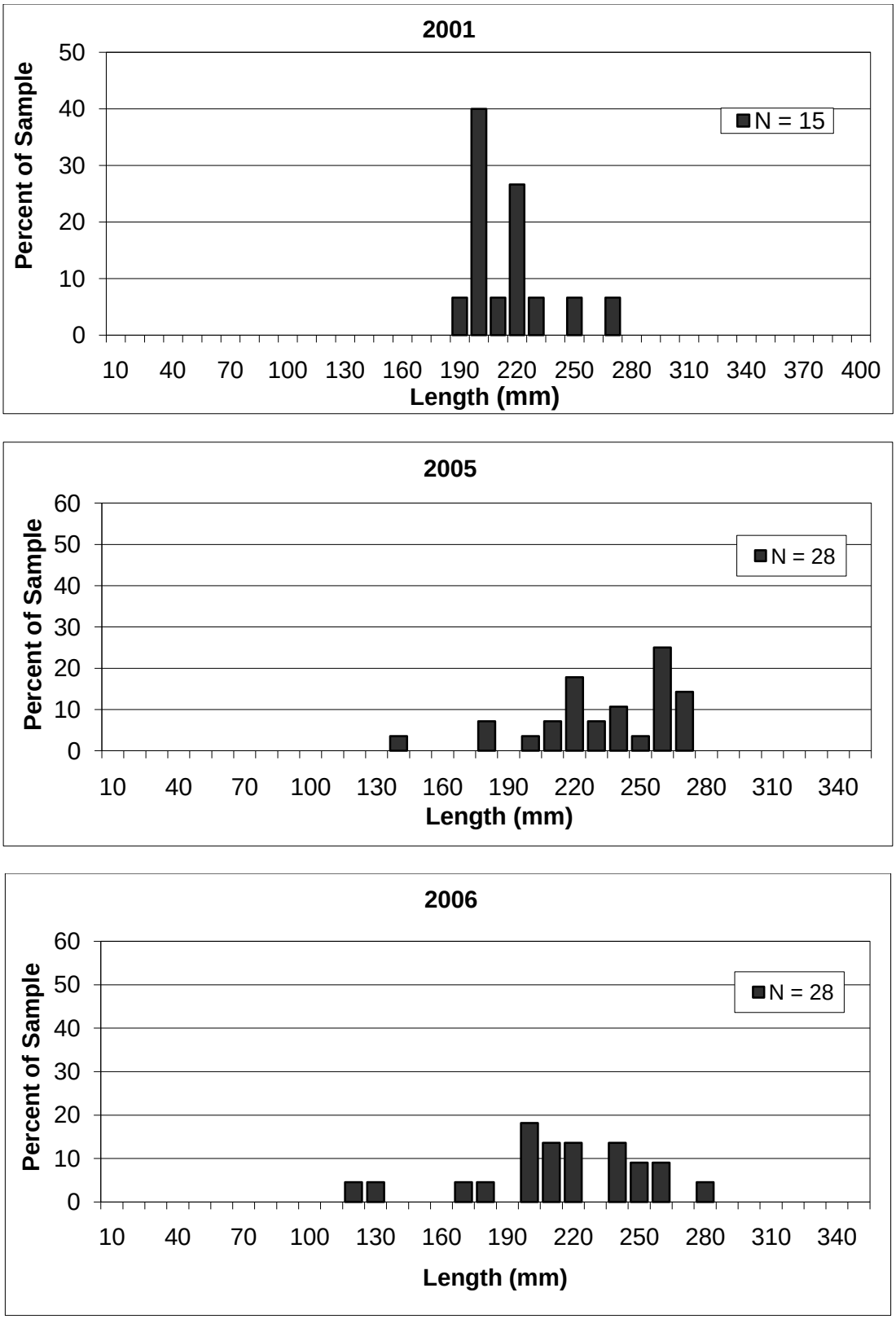


Figure 16. Length frequency distributions of black bullhead collected from standard lake surveys of Elk Creek Reservoir in 2001, 2005, and 2006.

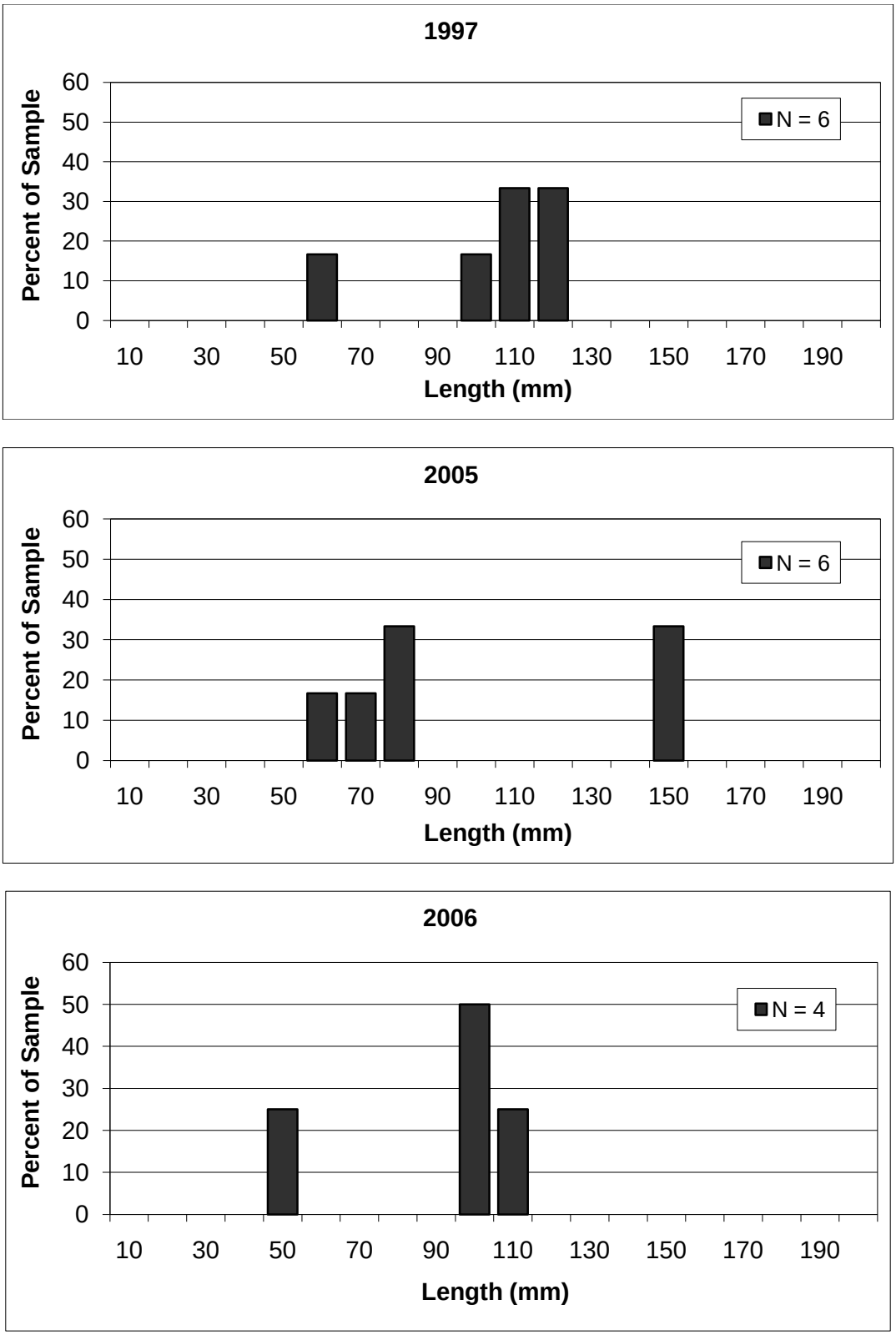


Figure 17. Length frequency distributions of bluegill collected from standard lake surveys of Elk Creek Reservoir in 1997, 2005, and 2006.

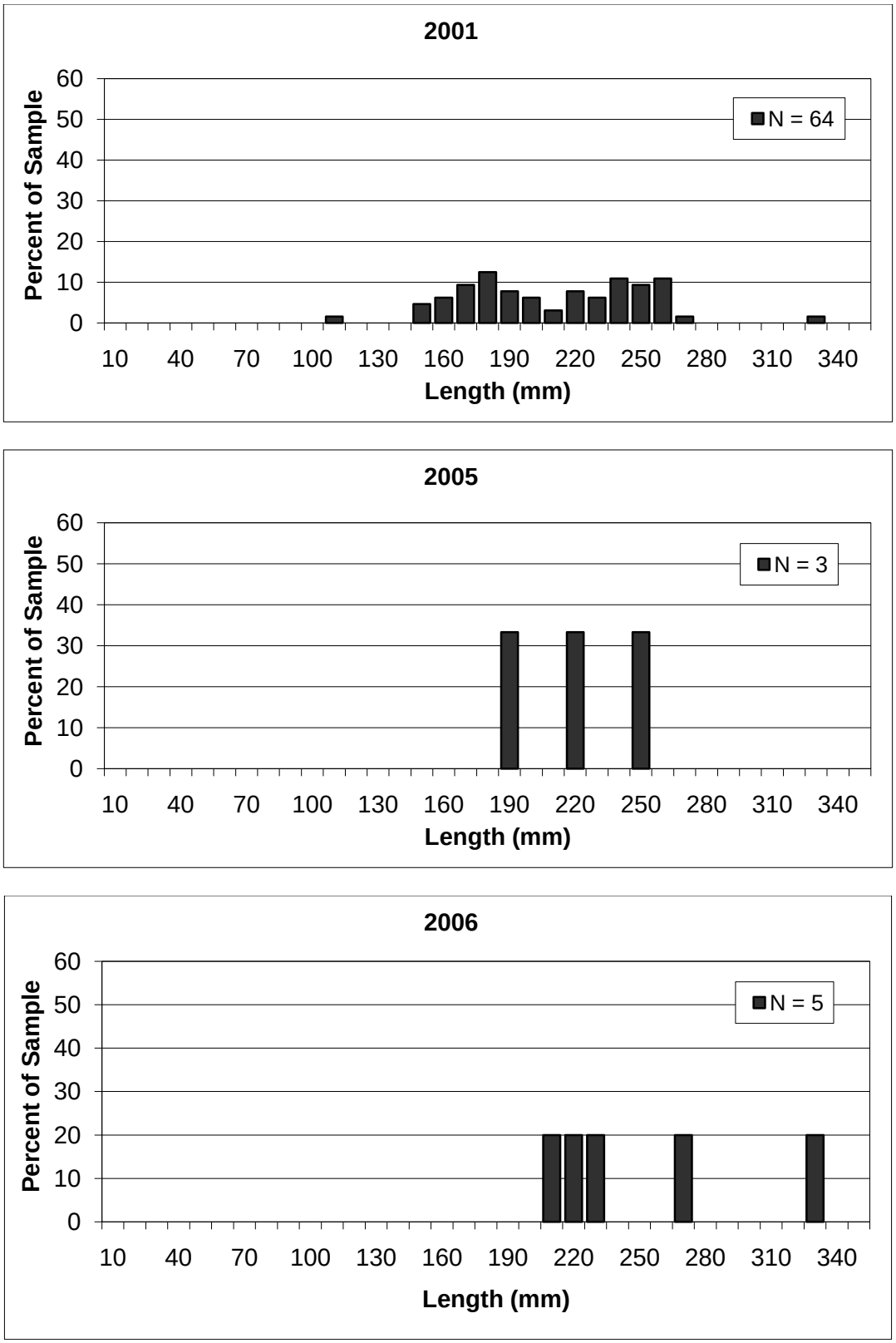
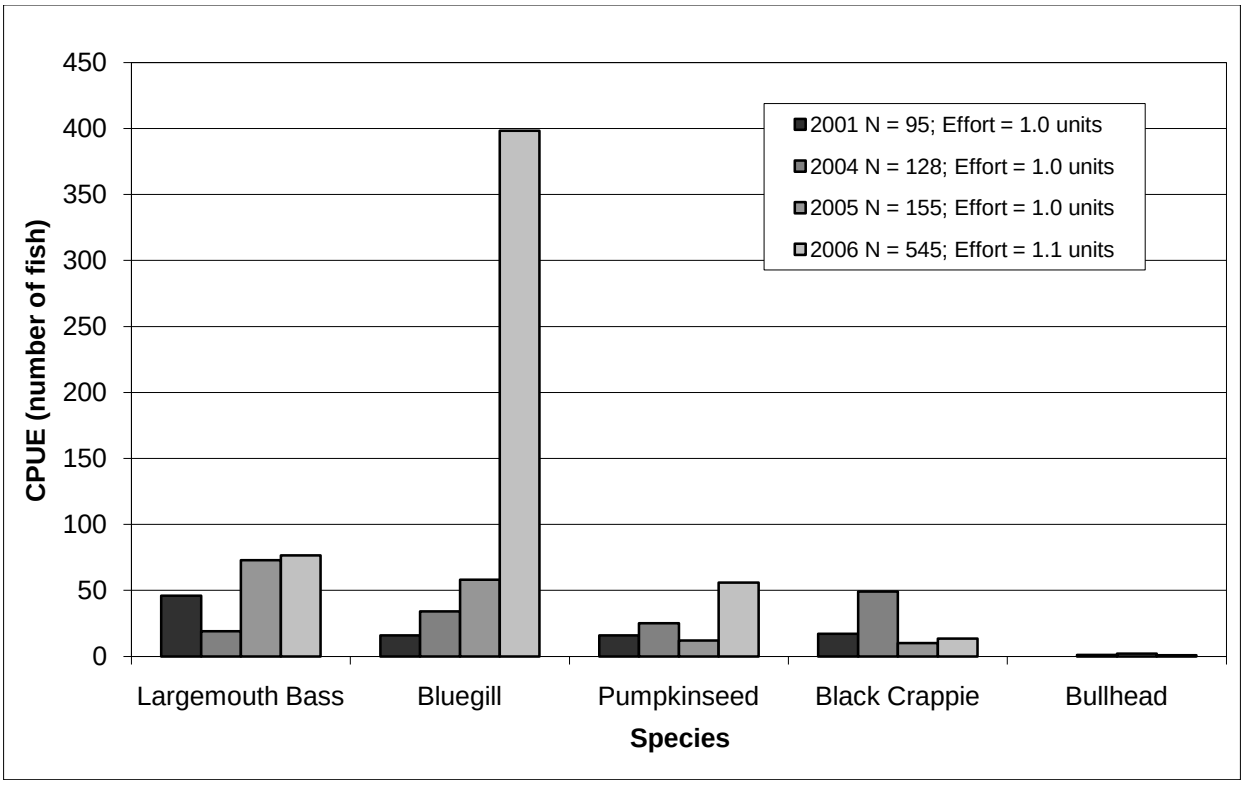


Figure 18. Length frequency distributions of brook trout collected from standard lake surveys of Elk Creek Reservoir in 2001, 2005, and 2006.



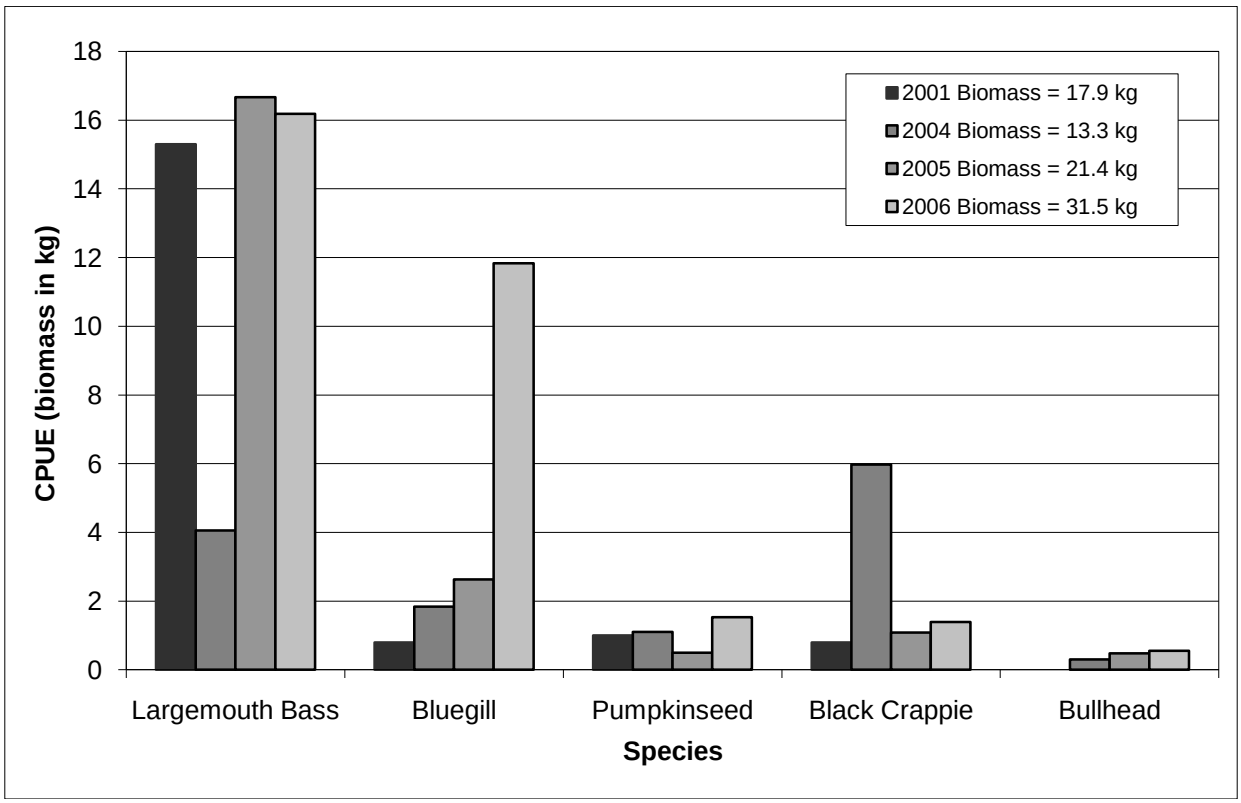
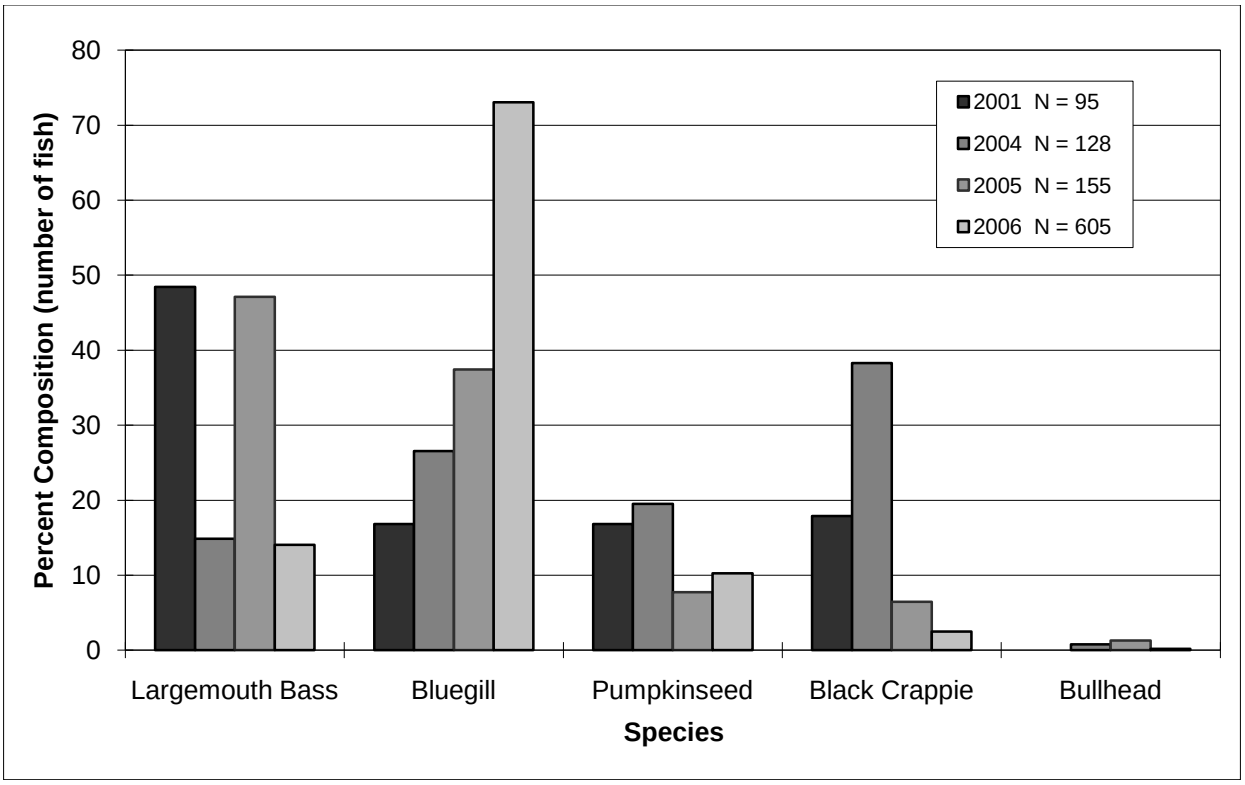


Figure 19. Catch per unit effort (CPUE) of fish collected from standard lake surveys of Moose Creek Reservoir in 2001 and 2004-2006, by number of fish and biomass.



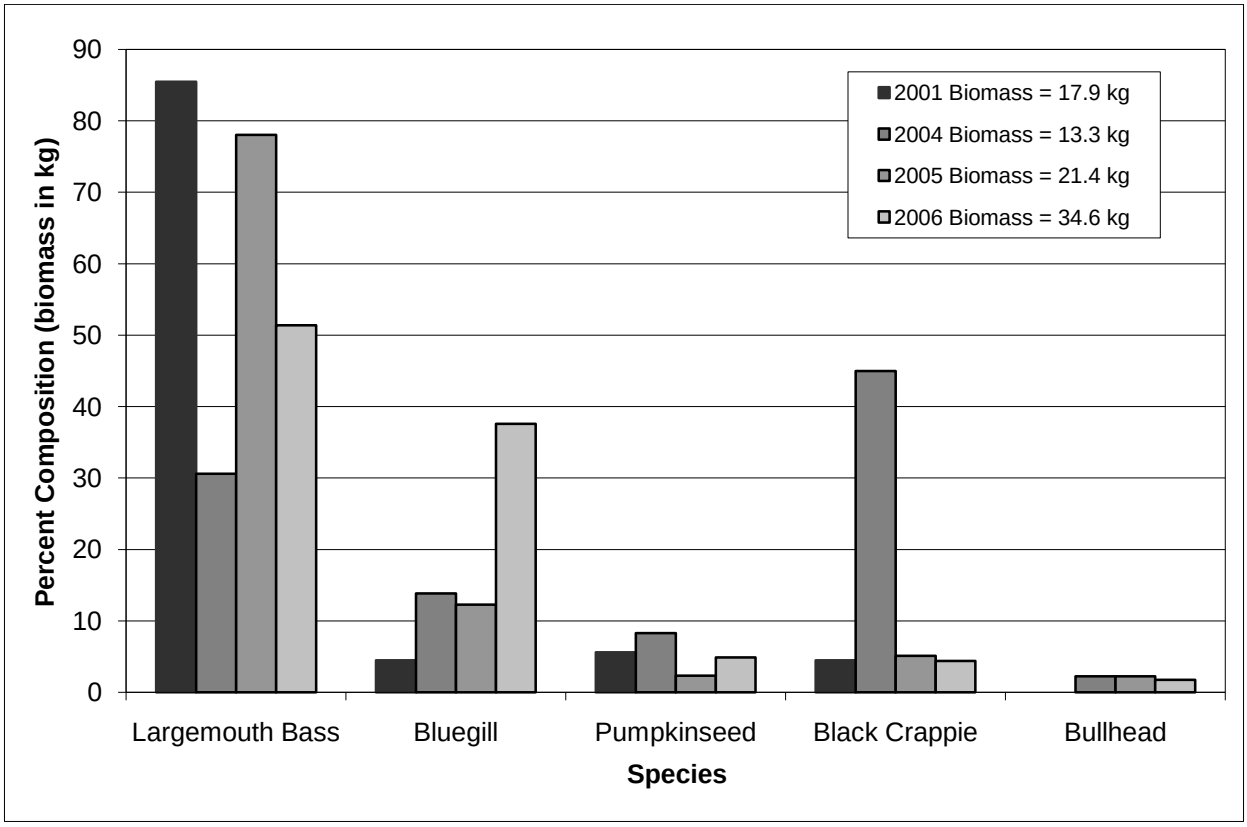


Figure 20. Percent composition of fish collected from standard lake surveys of Moose Creek Reservoir in 2001 and 2004-2006 by number of fish and biomass.

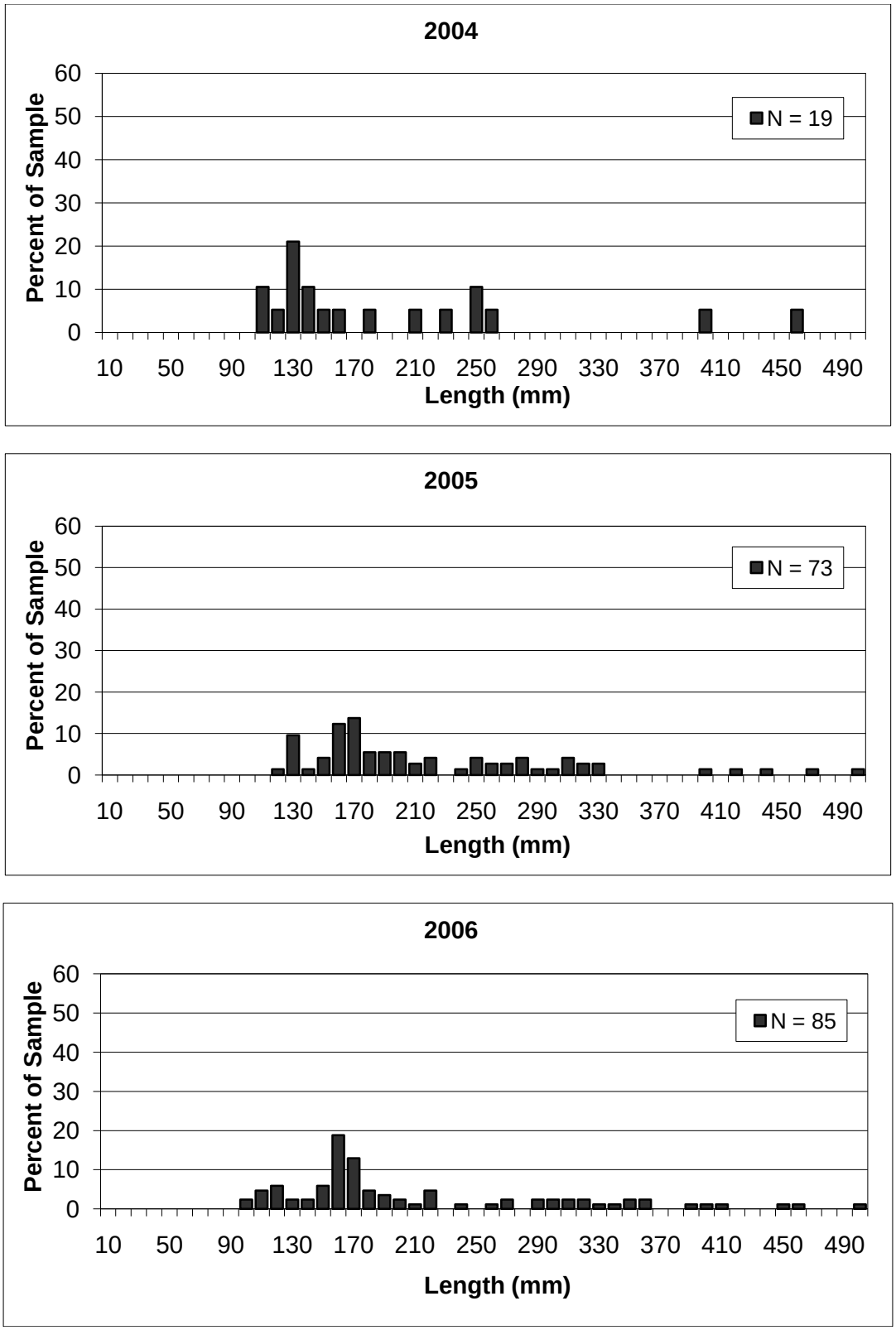
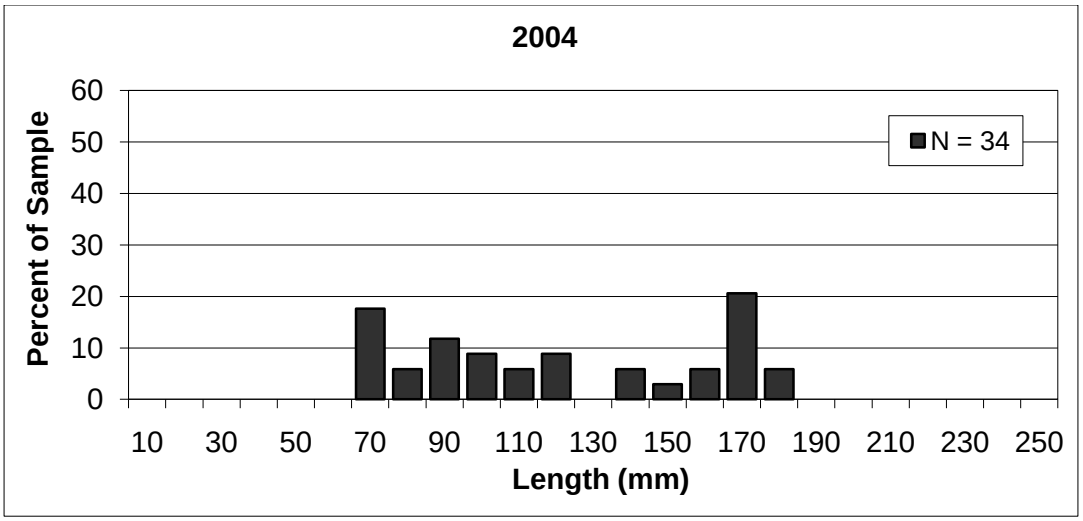
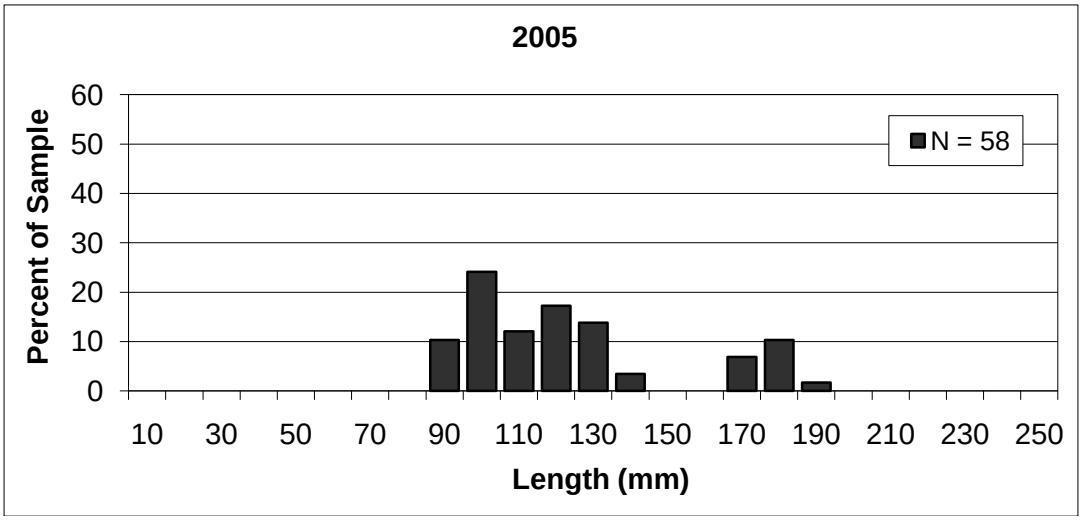


Figure 21. Length frequency distributions of largemouth bass collected from standard lake surveys of Moose Creek Reservoir in 2004 - 2006.





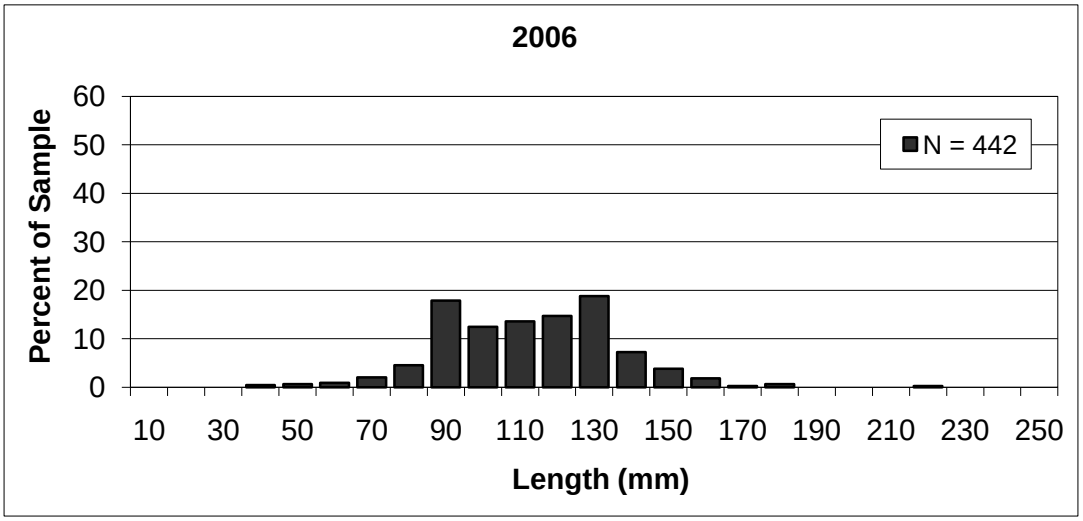


Figure 22. Length frequency distributions of bluegill collected from standard lake surveys of Moose Creek Reservoir in 2004 - 2006.

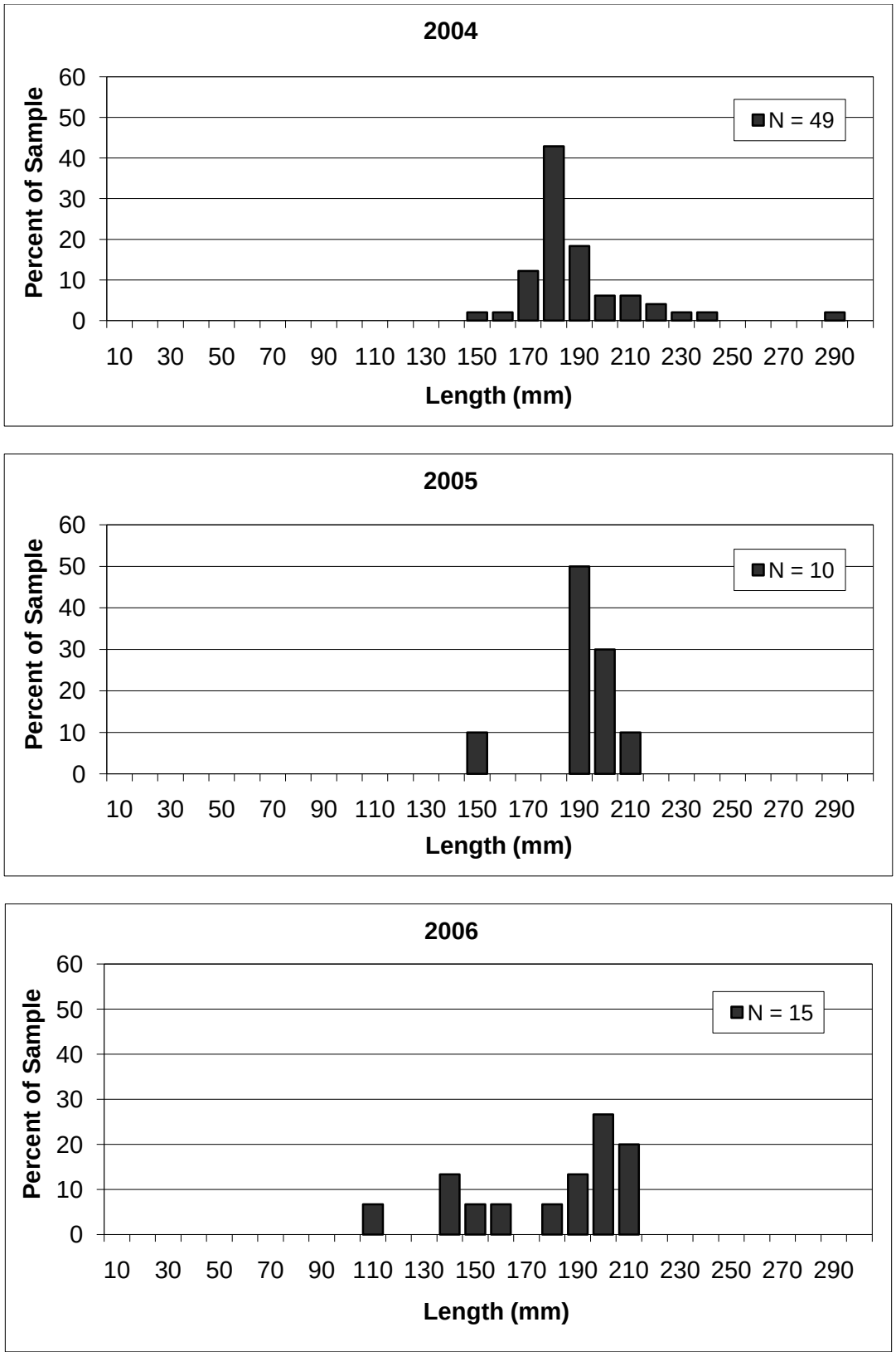
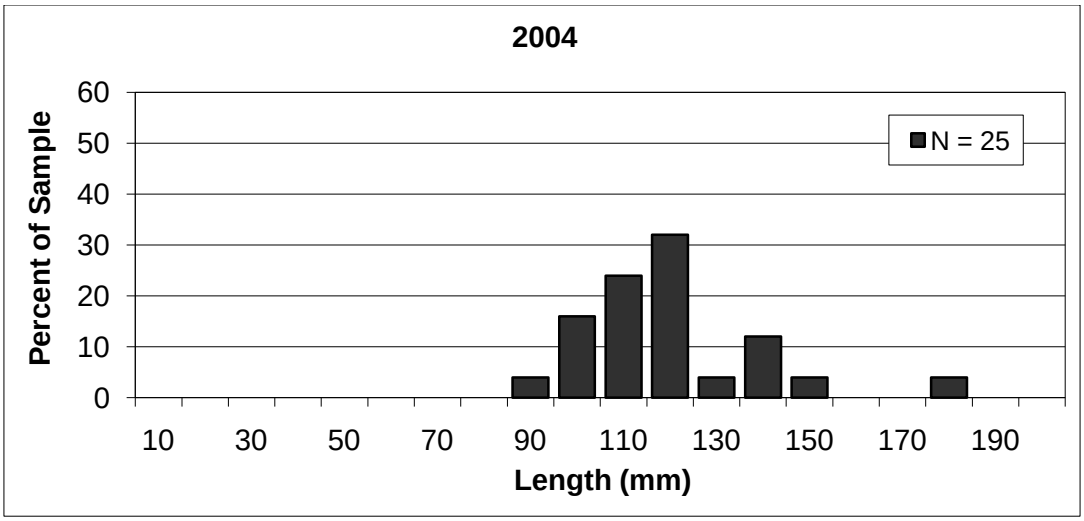
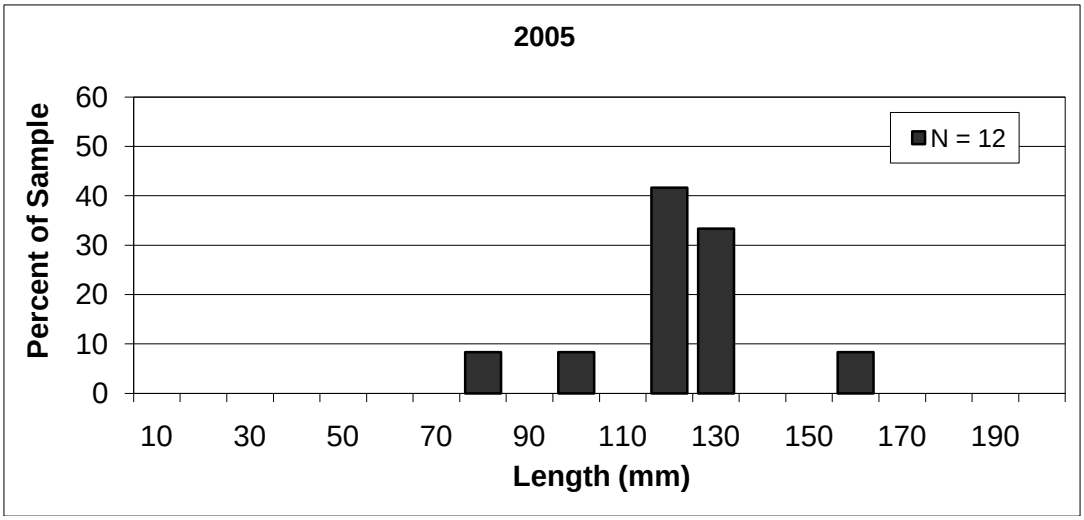


Figure 23. Length frequency distributions of black crappie collected from standard lake surveys of Moose Creek Reservoir in 2004 - 2006.





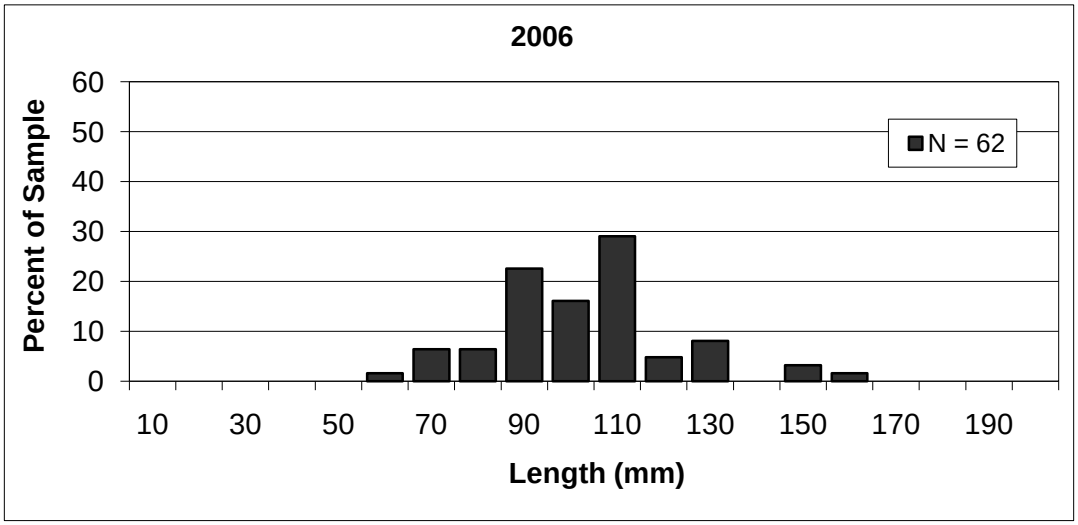
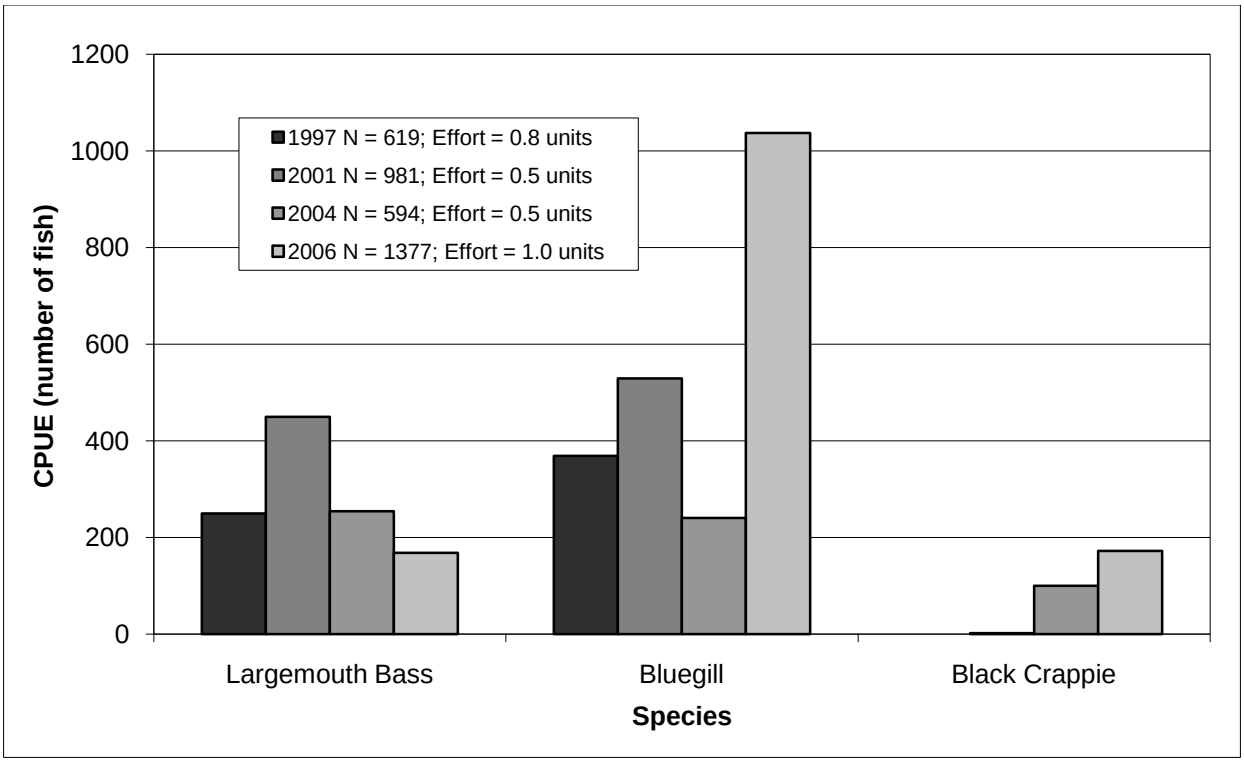


Figure 24. Length frequency distributions of pumpkinseed collected from standard lake surveys of Moose Creek Reservoir in 2004 - 2006.



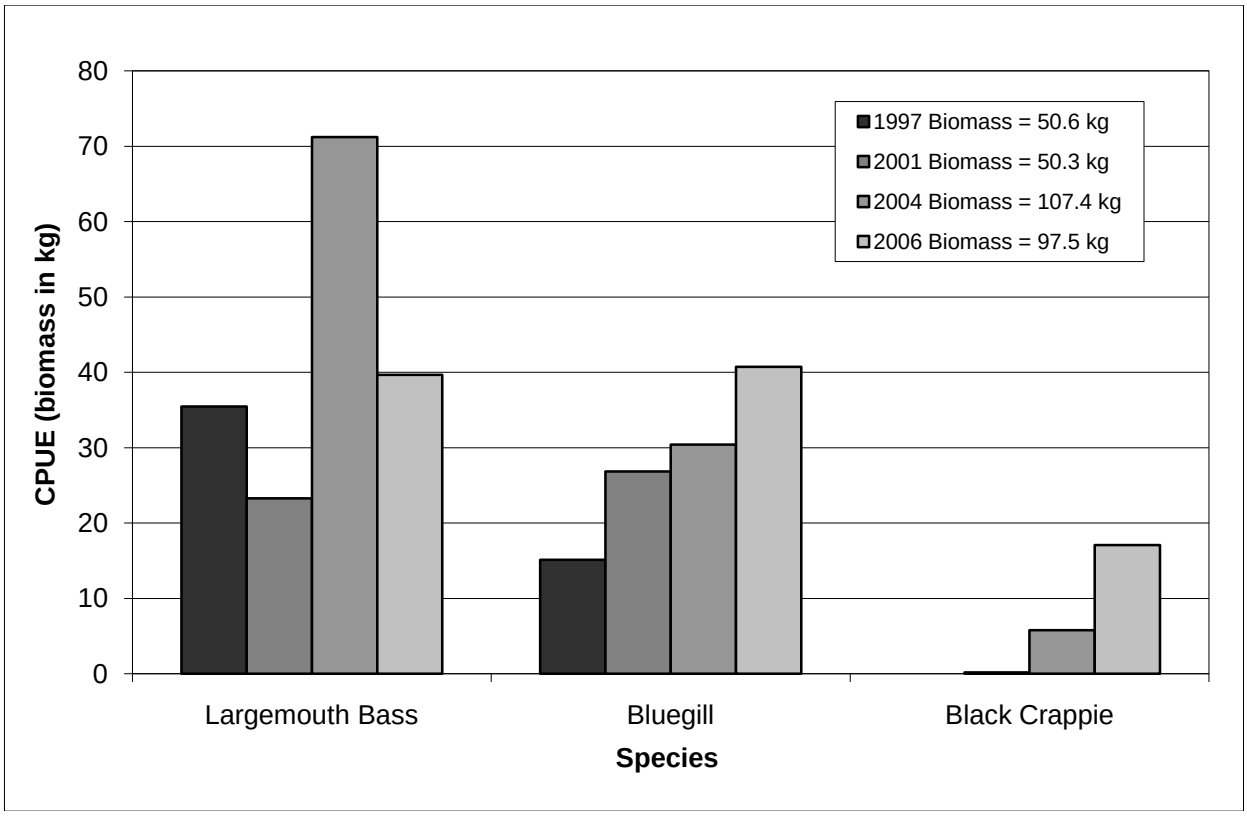
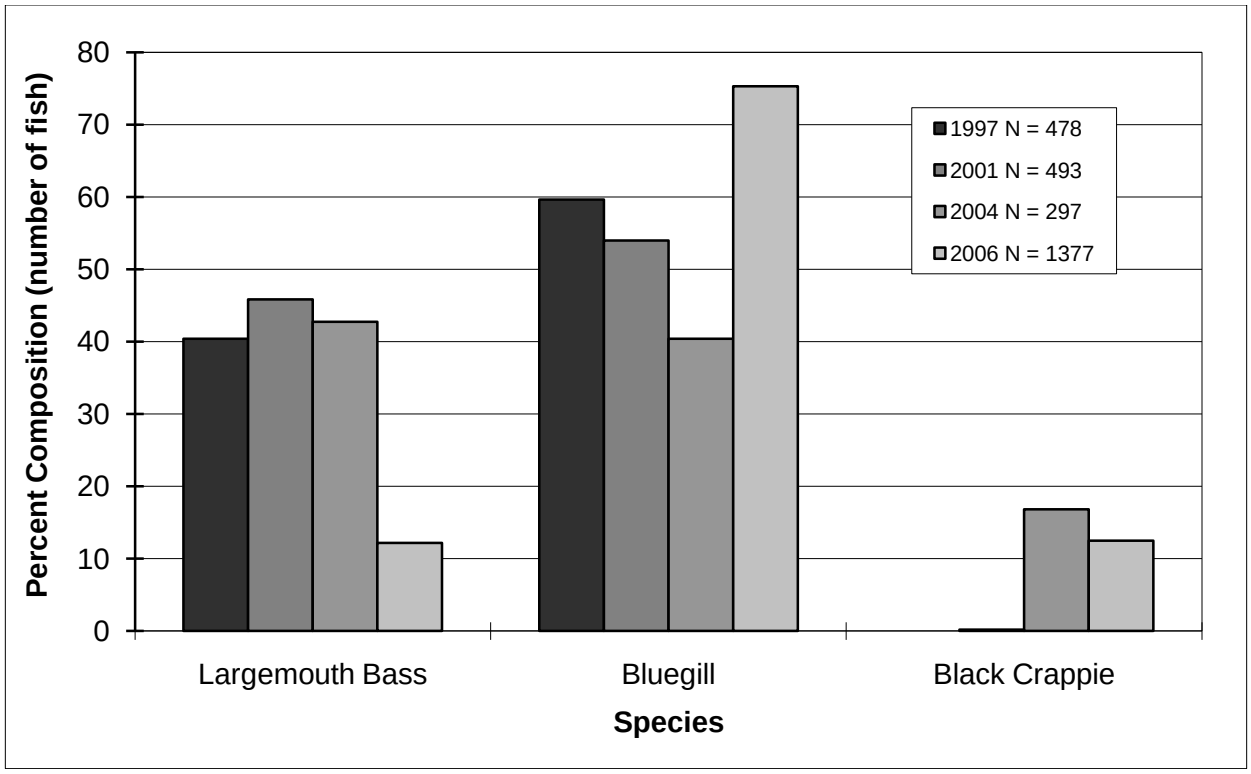


Figure 25. Catch per unit effort (CPUE) of fish collected from standard lake surveys of Spring Valley Reservoir in 1997, 2001, 2004, and 2006, by number of fish and biomass.



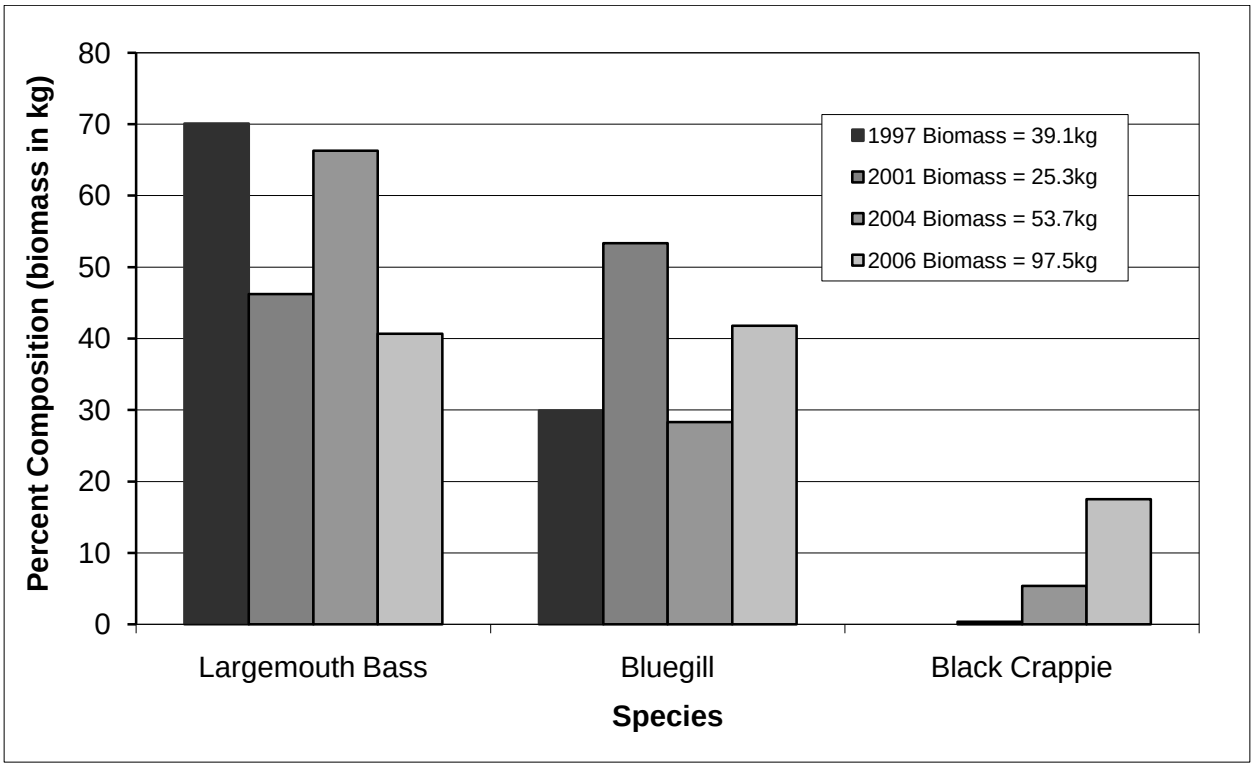


Figure 26. Percent composition of fish collected from standard lake surveys of Spring Valley Reservoir in 1997, 2001, 2004, and 2006, by number of fish and biomass.

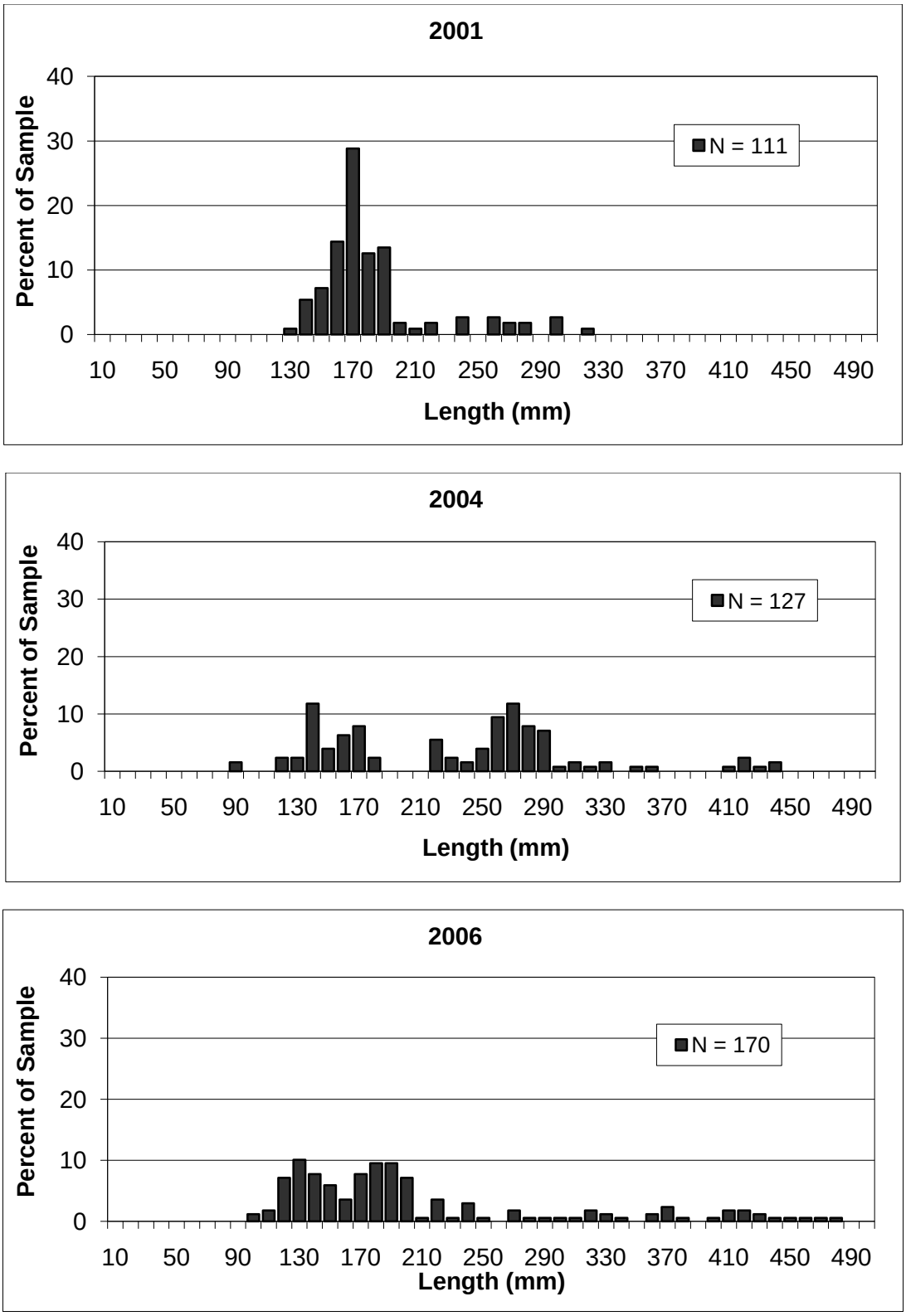


Figure 27. Length frequency distributions of largemouth bass collected from standard lake surveys of Spring Valley Reservoir in 2001, 2004, and 2006.

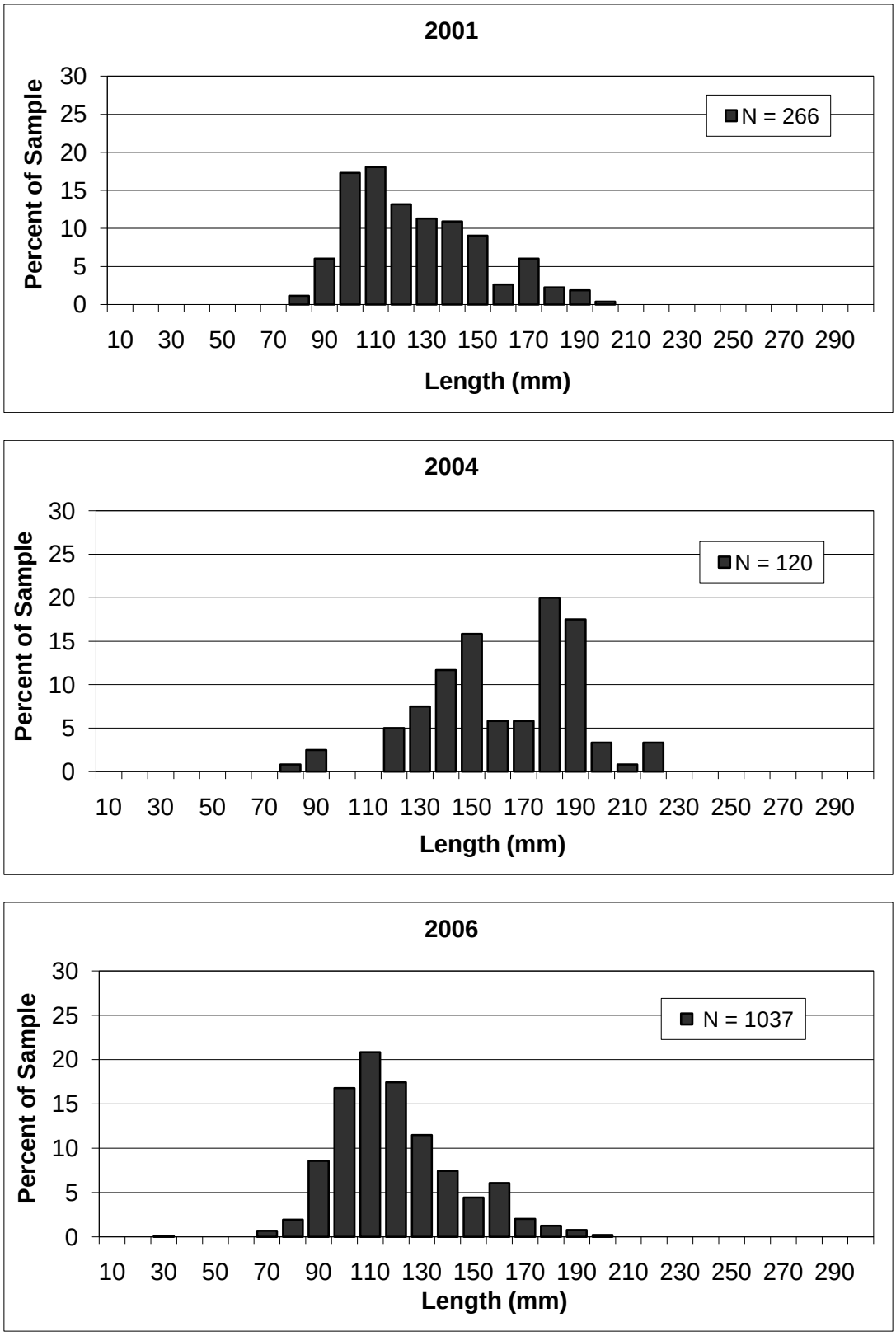


Figure 28. Length frequency distributions of bluegill collected from standard lake surveys of Spring Valley Reservoir in 2001, 2004, and 2006.

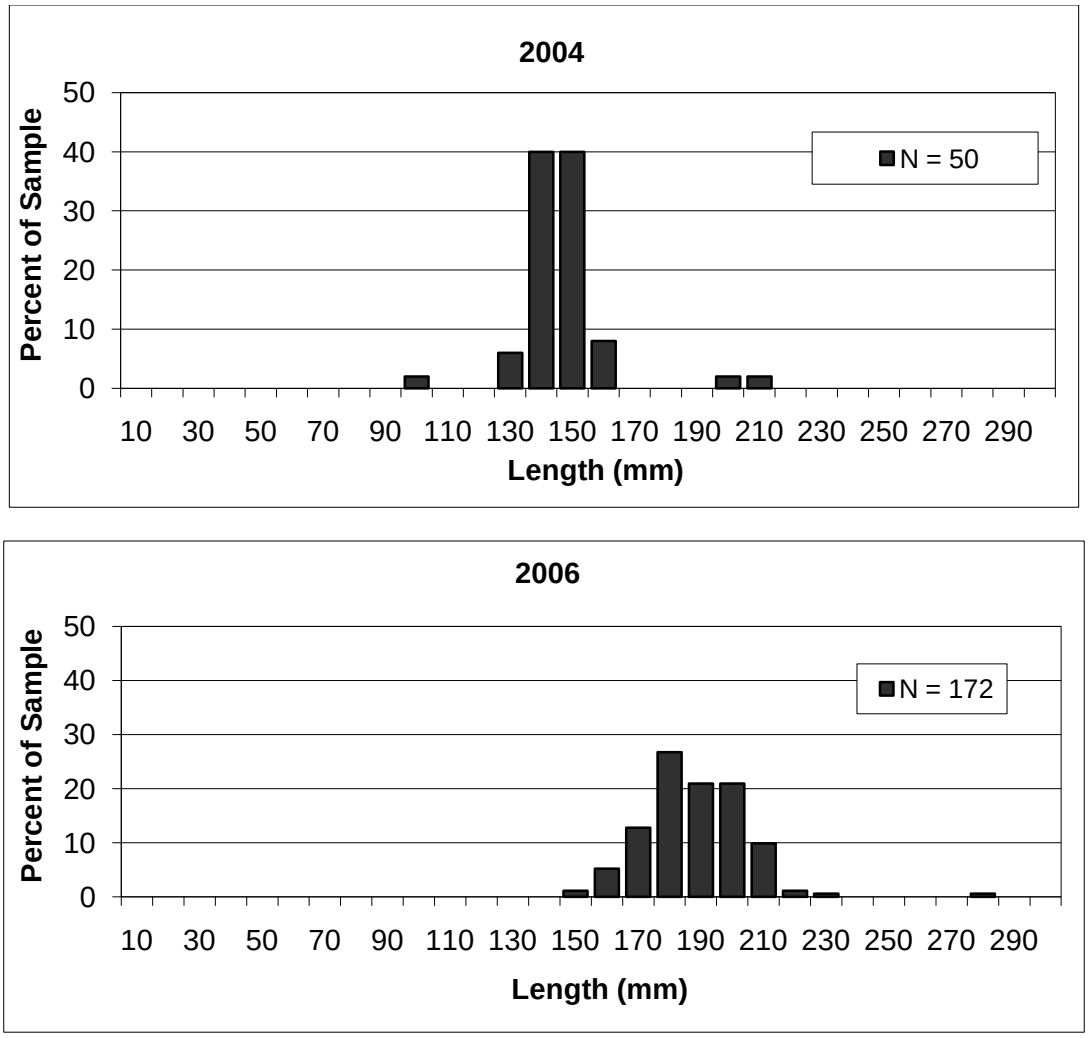


Figure 29. Length frequency distribution of black crappie collected from standard lake surveys of Spring Valley Reservoir in 2004 and 2006.

Rivers and Streams Investigations

Regional Objective

1. Develop long-term fish population database on selected streams throughout the Clearwater Region.

Results and Discussion

Salmon River

The annual smallmouth bass survey of the lower Salmon River was not conducted in 2006 due to the need to immediately address the illegal introduction of golden shiners into Deer Creek Reservoir.

Selway River

Due to extremely low water flows, the annual snorkel and hook-and-line surveys of fisheries in the Selway River were not conducted in 2006.

Management Recommendation

1. Conduct population and genetic sampling of Westslope cutthroat trout in the Clearwater River for the development of a Westslope Cutthroat Trout Management Plan.

Habitat Management

Regional Objectives

1. Develop new fishing waters in the Clearwater Region.
2. Address water quality and fish habitat issues in regional lowland lakes and reservoirs.

Results and Discussion

Deer Creek Reservoir

Monthly dissolved oxygen profiles are shown in Figure 30.

Elk Creek Reservoir

Monthly dissolved oxygen profiles are shown in Figure 31.

Mann Lake

Monthly dissolved oxygen profiles are shown in Figure 32.

Moose Creek Reservoir

Monthly dissolved oxygen profiles are shown in Figure 33.

Robinson Pond

Due to the decline of habitat quality in Robinson Pond, we were unable to stock hatchery trout in the pond during 2006. This has prompted IDFG and the Upper Clearwater Community Foundation in Kamiah to work on improving habitat quality in the pond and improving access. The water from the spring is now being piped all the way from the spring to the pond. The upper half of this pipe was installed by the Flying B ranch as part of an agreement with IDFG. Additionally, the pond was sprayed with Reward herbicide on June 21, 2006 to remove nuisance aquatic vegetation and algae.

Soldier's Meadow Reservoir

Monthly dissolved oxygen profiles are shown in Figure 34.

Spring Valley Reservoir

Monthly dissolved oxygen profiles are shown in Figure 35.

Waha Lake

A hypolimnetic aeration system with two units continues to operate in Waha Lake. This system provides additional oxygen in the hypolomnion to increase habitat available for trout. Monthly dissolved oxygen profiles are shown in (Figure 36).

Winchester Lake

Fish habitat and water quality issues continue to be addressed in Winchester Lake through the implementation of a hypolimnetic aeration system. Monthly dissolved oxygen profiles illustrate the annual loss of oxygen in the hypolimnion of Winchester Lake during the summer months (Figure 37).

Management Recommendations

1. Continue monitoring effectiveness of aeration systems through 2008, with project evaluation in December 2008.

2. Continue to address maintenance of Robinson Pond including: fix leaks in water delivery pipe, utilize herbicides to control nuisance vegetation, work with community group in Kamiah to procure a pond liner for sealing the pond, and other pond improvements.

3. Utilize aquatic herbicides to control nuisance vegetation and algae in regional lowland lakes, reservoirs, and ponds.

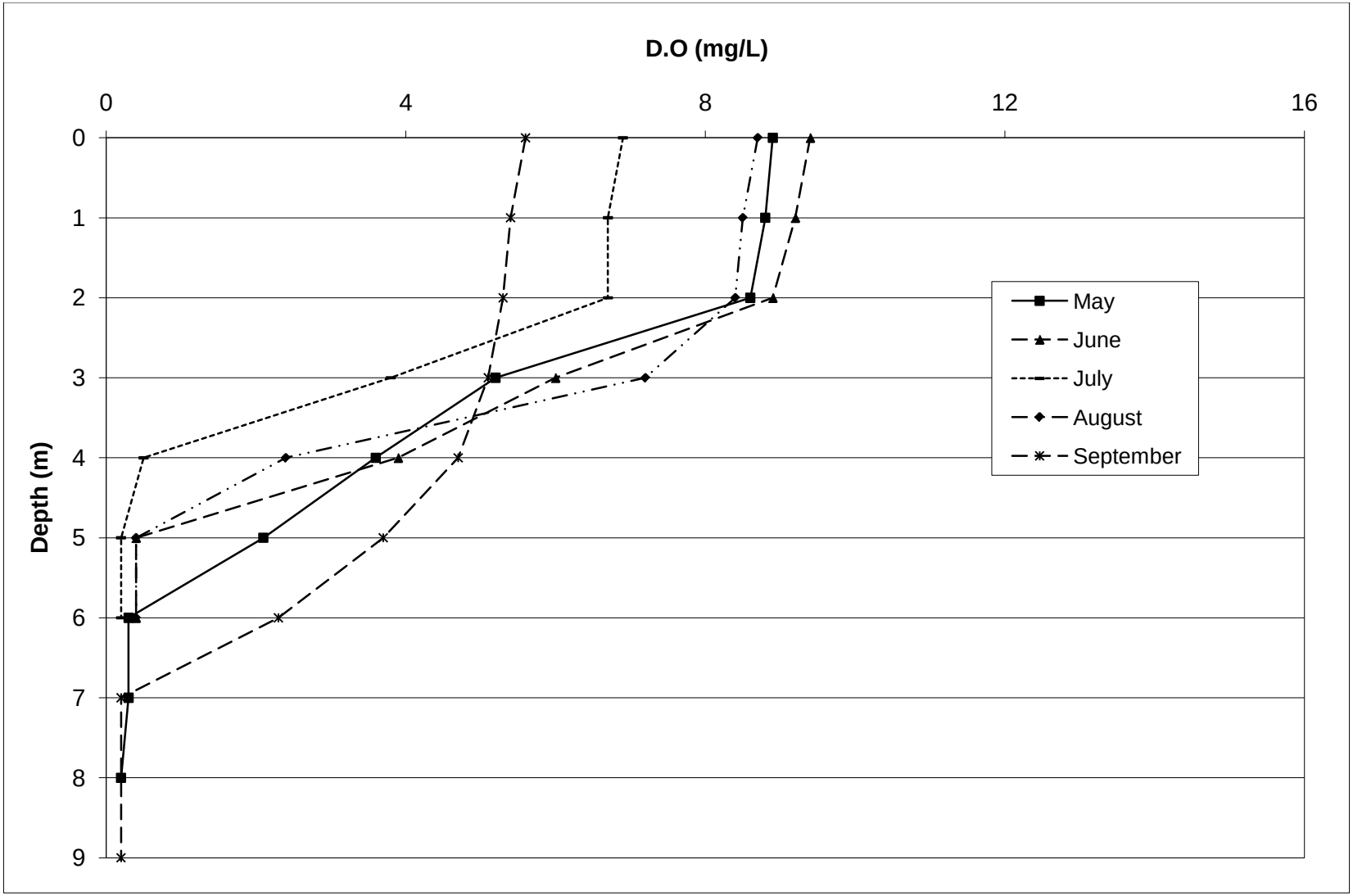


Figure 30. Monthly dissolved oxygen (D.O.) profiles of Deer Creek Reservoir during 2006.

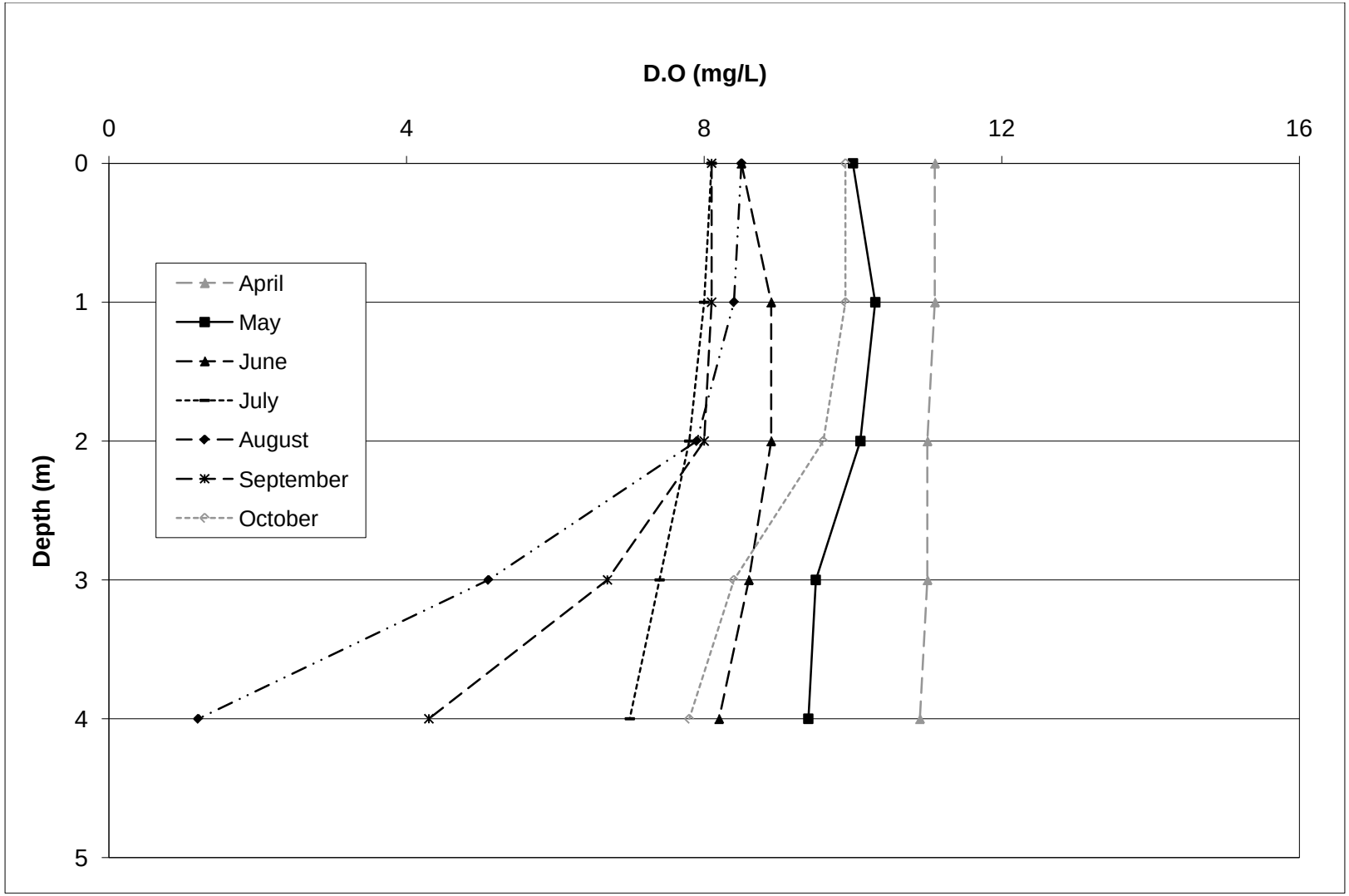


Figure 31. Monthly dissolved oxygen (D.O.) profiles of Elk Creek Reservoir during 2006.

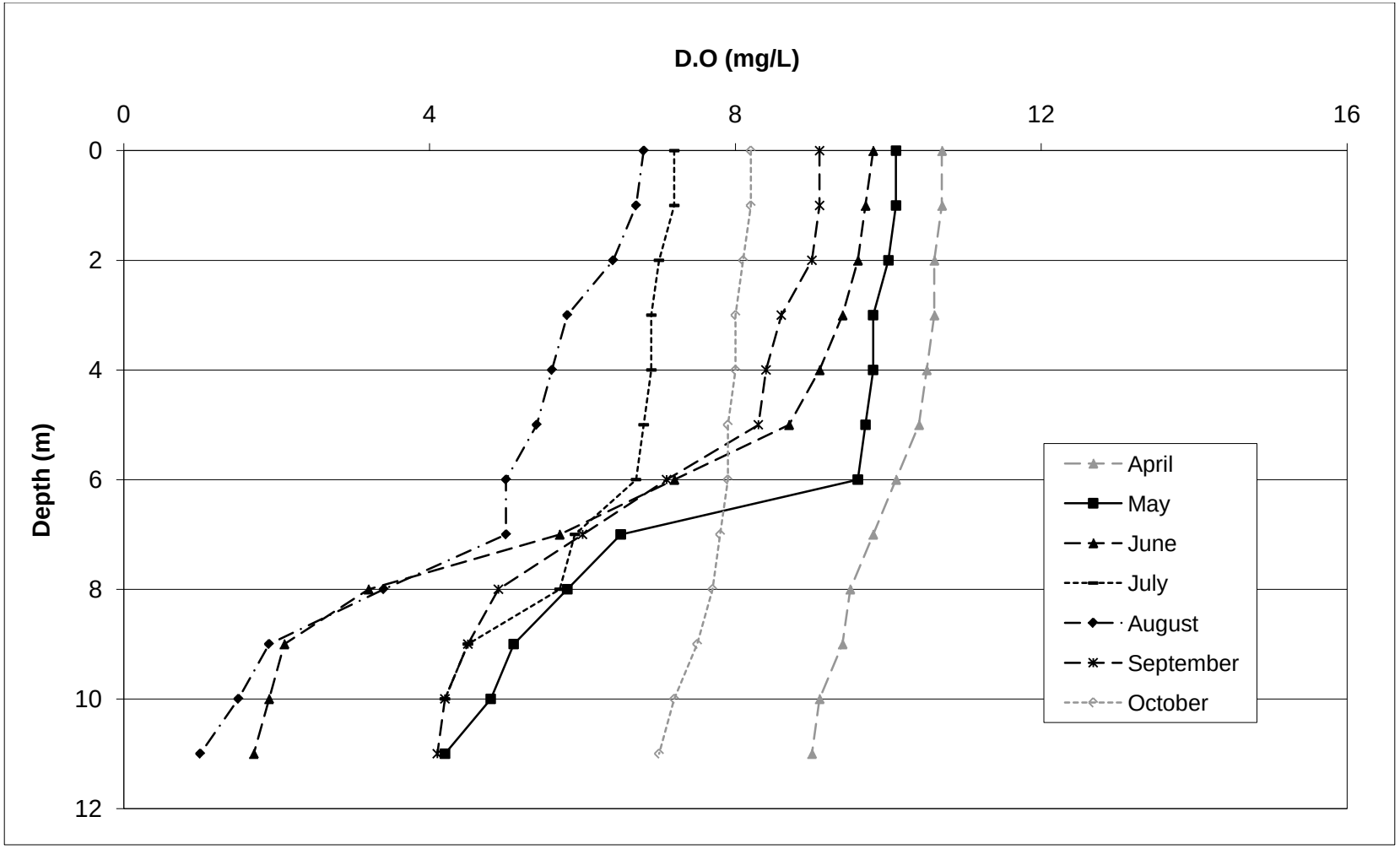


Figure 32. Monthly dissolved oxygen (D.O.) profiles of Mann Lake during 2006.

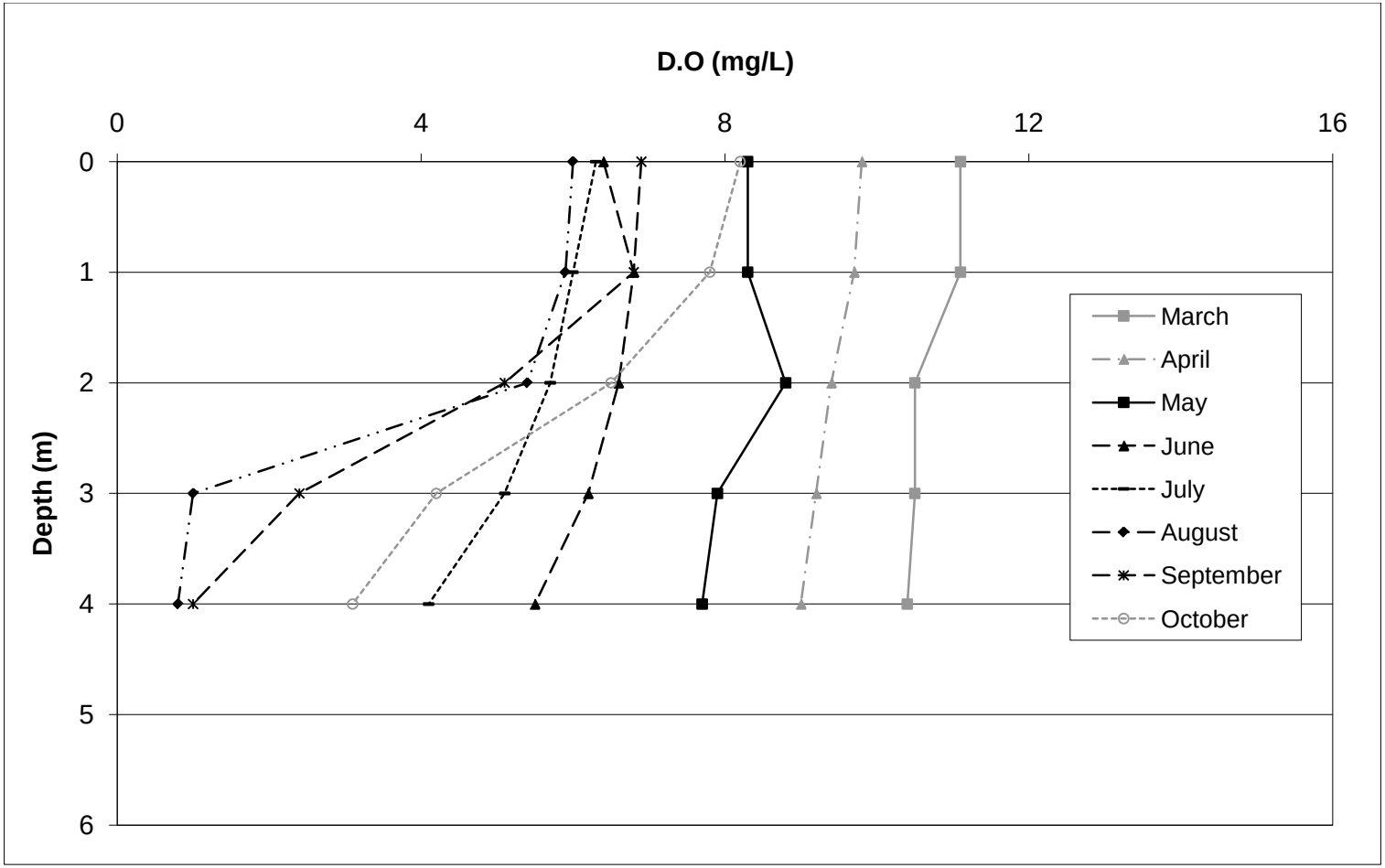


Figure 33. Monthly dissolved oxygen (D.O.) profiles of Moose Creek Reservoir during 2006.

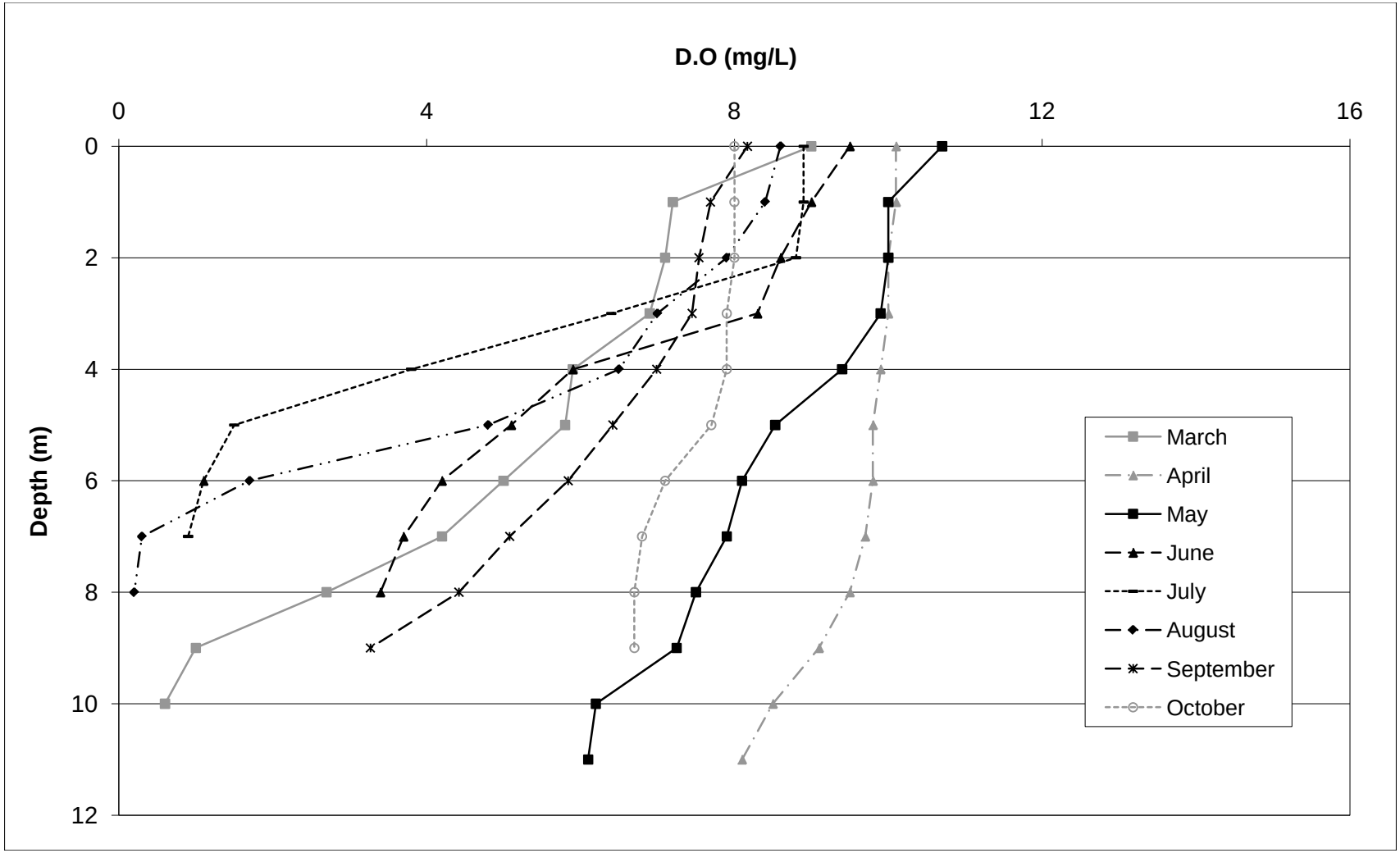


Figure 34. Monthly dissolved oxygen (D.O.) profiles of Soldier's Meadow Reservoir during 2006.

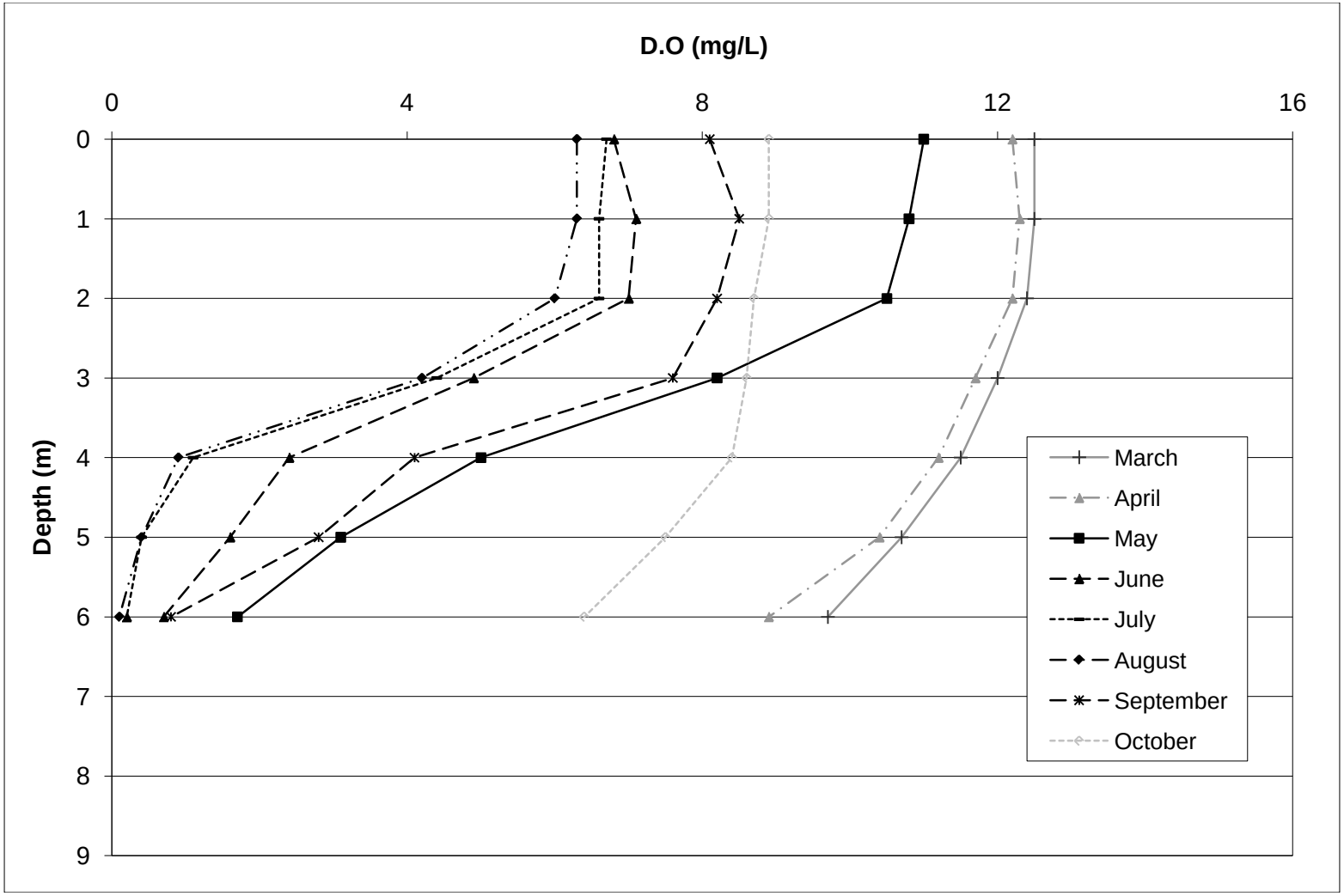


Figure 35. Monthly dissolved oxygen (D.O.) profiles of Spring Valley Reservoir during 2006.

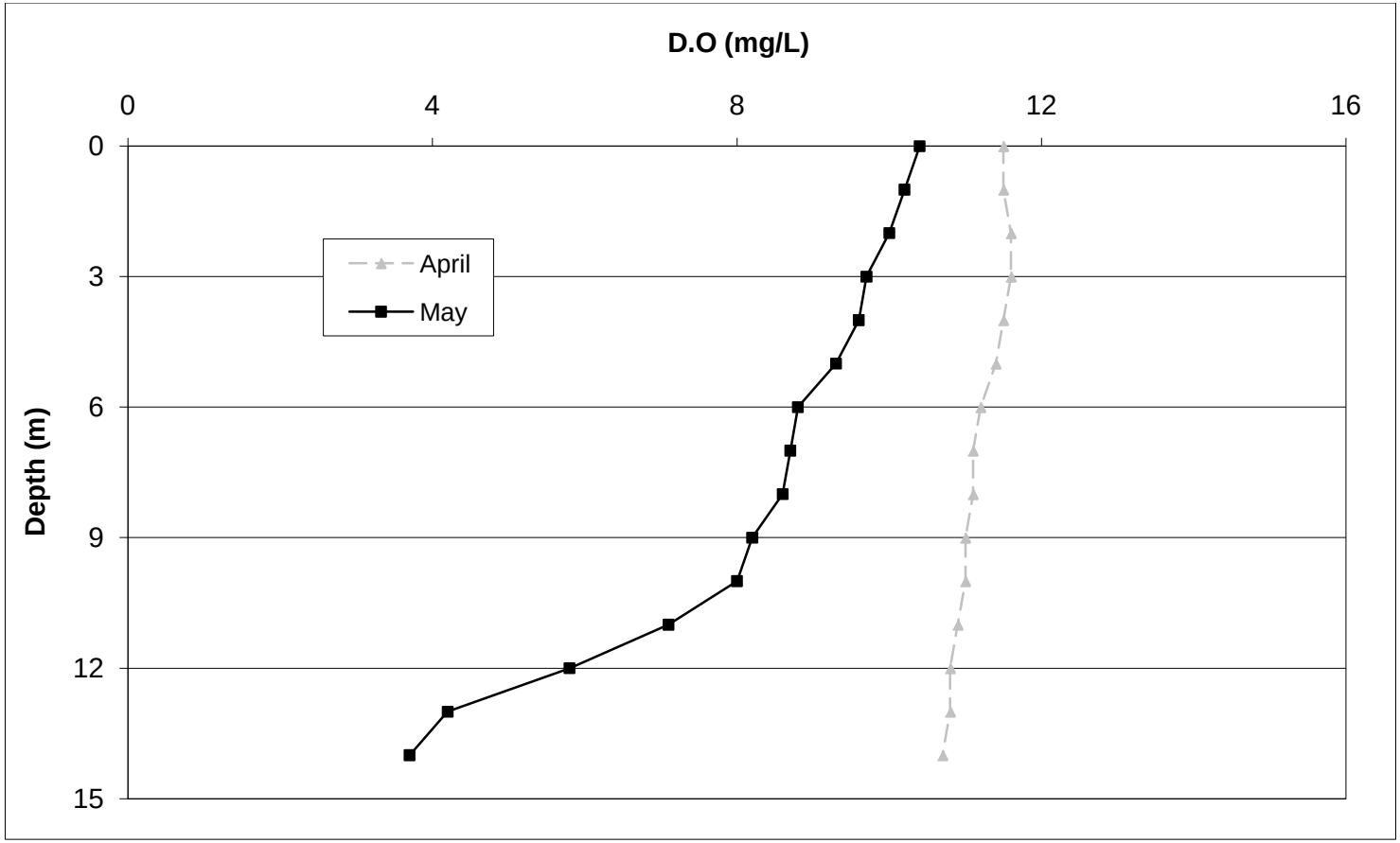


Figure 36. Monthly dissolved oxygen (D.O.) profiles of Waha Lake during 2006.

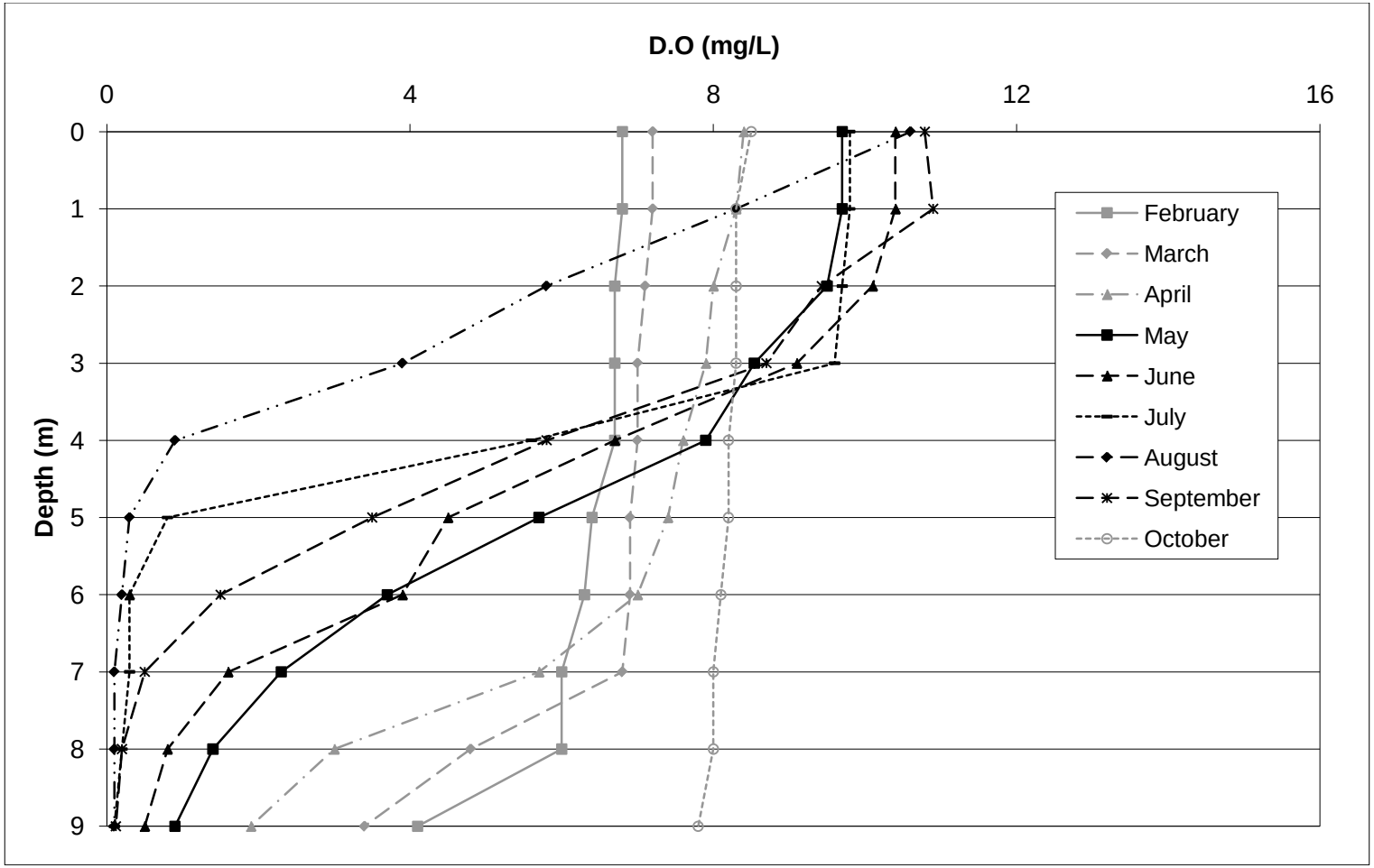


Figure 37. Monthly dissolved oxygen (D.O.) profiles of Winchester Lake during 2006.

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