

2023 Long Pine Creek Historical Summary by the Decades Nebraska Game and Parks Commission

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Background

Long Pine Creek is located near the east boundary of Brown County, Nebraska. Long Pine Creek is a nearly 33-mile-long prairie stream that offers some of Nebraska's best trout fishing. Headwaters of Long Pine Creek originate just south of the town of Long Pine, Nebraska, flowing northward through wet meadows towards its confluence at the Niobrara River. Bone Creek meets Long Pine on the northwest corner of Pine Glen WMA. Long Pine Creek was the first in Nebraska to be granted instream appropriation in 1989, which guarantees it must maintain a minimum flow.

The stream supports naturally reproducing populations of both brown and rainbow trout. Trout have been documented in Long Pine Creek as early as 1896 (Fishes of Missouri Handbook). Trout have been stocked nearly every year since 1932 to supplement their populations and offer more angling opportunities. Previous creel surveys found that stocked trout contributed to 71% of harvested fish (Creel Census, 1986). Stocking regimens have been inconsistent over the years. From the 1930's through the 1970's, brown, rainbow and brook trout were stocked with the size at stocking ranging from fry to 12 inches and annual stocking numbers ranging anywhere from 400 to 23,000. In the 1980's, low density and larger size brown trout only stockings were attempted. After 1990, stockings switched to rainbow trout only at low densities and larger sizes. The current stocking regime is between 250 and 300 rainbow trout stocked three times a year; before Memorial Day, the Fourth of July, and Labor Day.

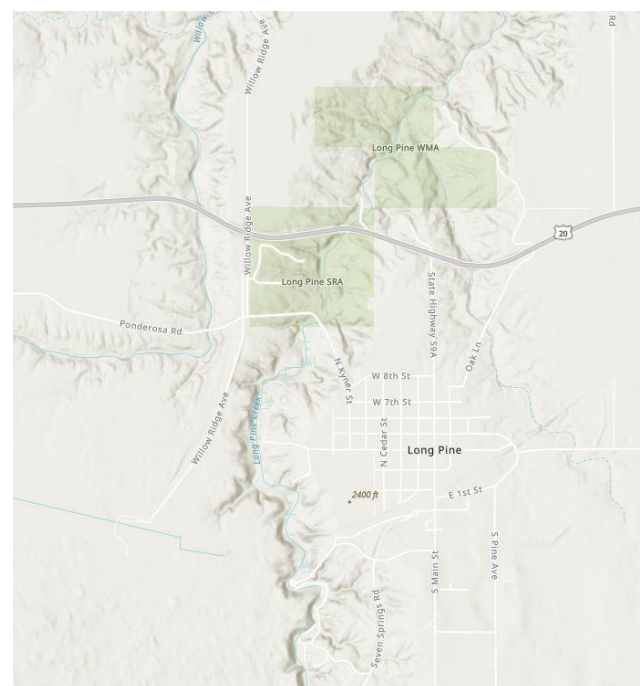


Sampling Efforts

There were three sampling reaches between 150 and 250 meters that were consistently sampled since the 1970's on Long Pine Creek. Moving from south to north toward the confluence, those reaches accessible to the public are Long Pine SRA Upper, Long Pine WMA, and Pine Glen WMA.

Long Pine SRA sits on 154 acres and contains 0.75 miles of Long Pine Creek. There are two sampling reaches on the SRA, the upper and lower. For data analysis purposes, these reaches were combined. This is the most heavily fished reach due to the ease of access to the park, camping areas and picnic shelters. The SRA is also a popular spot for tubers to access the creek.

Long Pine WMA is the next reach moving north toward the confluence. Long Pine WMA sits on 160 public



acres and contains 0.5 miles of Long Pine Creek. This reach is wider and shallower compared to the SRA and it isn't as heavily fished due to the limited access.

Pine Glen WMA is the next reach moving north toward the confluence. Pine Glen WMA sits on 960 public acres and contains 1.5 miles of Long Pine Creek. This is the widest reach with higher flows than the other areas, which makes it tough to sample. Pine Glen WMA is also a challenging walk-in access, which may entice an angler up for a challenge.

Historical data were compiled by decade, starting with the 1970's and going through the 2010's. Data were compiled by sampling reach and compared. The length frequencies, number of fish per meter and number of fish greater than or equal to 9 inches (228 mm) per meter were compiled by decade for both brown and rainbow trout. Proportional size structure (PSS) was calculated based on nine inches because that is what is considered a nice, catchable sized trout. Data were only used if a boat generator was the sampling gear for fish collection. As a result, not all sampling reaches had data for every decade. Sample sizes for each reach and decade are shown in Table 1.

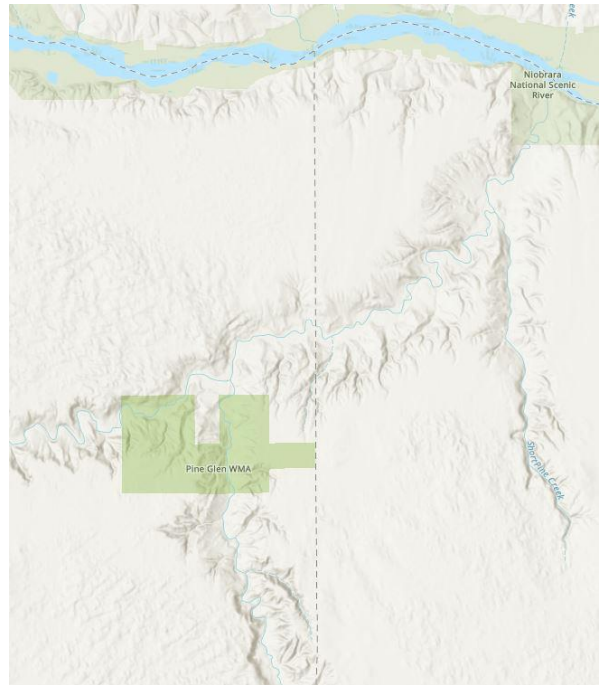


Table 1.- Number of surveys combined for length frequency data analysis per decade by sampling reach in Long Pine Creek, Nebraska (1970s-2010s).

Sampling Reach	Decade	Sample Size (# of surveys)
Long Pine SRA Upper	1970	3
	1980	5
	1990	10
	2000	9
	2010	4
Long Pine WMA	1990	10
	2000	10
	2010	8
Pine Glen WMA	1970	2
	1980	2
	1990	4
	2000	1
	2010	6

Results

Long Pine SRA Upper

Length frequencies of brown trout in Long Pine SRA showed similar length-frequency distributions between decades, with 1970 being more of an outlier than the other decades (Figure 1). Data from 1970 did not peak where the other decades were peaking, but the 1970's still showed a similar distribution and length range (Figure 1). The overall PSS for brown trout in Long Pine SRA was 38 (Figure 7). Brown trout catch rates on the SRA have increased over time as well as catch rates of brown trout 9 inches and larger (Figures 9 and 12). In addition, brown trout tend to outnumber rainbow trout by a 2:1 margin or more (Figures 9 and 12).

Length frequencies of rainbow trout in Long Pine SRA also showed similar length-frequency distributions between decades and again, 1970 was more of an outlier than the other decades (Figure 2). Beginning in the 2000's and continuing into the 2010's there is an improvement in size structure of rainbow trout over 9 inches (Figures 2). The improvement in size structure in the 2000's and 2010's is likely due to the influence of the stocked rainbow trout. Rainbow trout are stocked at the Long Pine SRA at catchable sizes ranging from 9 to 13 inches. The overall PSS for rainbow trout in Long Pine SRA was 29 (Figure 8). Overall, there hasn't been much change over the decades on Long Pine SRA for either brown or rainbow trout. Rainbow trout catch rates on the SRA have also been increasing over time, but not as steep of an increase as with brown trout (Figure 9). The number of rainbow trout 9 inches and larger has been increasing over time but may be influenced some by stocking from 2000 to the most recent survey (Figure 12).

Long Pine WMA

The purchase of Long Pine WMA did not occur until the mid-1980's, so there was no data available on this area until the 1990's. Like what was observed on Long Pine SRA, length frequencies of brown trout are similar over the decades, not showing much change over time (Figure 3). In the 2000's, there was a peak in catch of 90 mm brown trout that skewed the length frequencies of the other length groups (Figure 3). Had there not been as high of a frequency of the 90 mm brown trout, we would have seen more similarities across the decades for brown trout on the WMA. The overall PSS on Long Pine WMA for brown trout was 32 (Figure 7). Brown trout catch rates on Long Pine WMA have increased over time, with a steeper increase than what was observed on Long Pine SRA (Figure 10). Catch rates of brown trout 9 inches and larger is staying steady over time on Long Pine WMA (Figure 13). Like Long Pine SRA, brown trout tend to outnumber rainbow trout by a 2:1 margin (Figures 10 and 13).

Length frequencies of rainbow trout on Long Pine WMA are the best example of how little the length frequencies have changed over time (Figure 4). The overall PSS of rainbow trout on Long Pine WMA was 29 (Figure 8). Catch rates of rainbow trout on Long Pine WMA have also slightly increased over time, but again not as steep of an increase as with brown trout (Figure 10). Catch rates of rainbow trout 9 inches and larger is staying steady over time on Long Pine WMA (Figure 13).

Pine Glen WMA

Length frequency trends over time for brown trout on the Pine Glen WMA was much more variable (Figure 5). This reach is widening, and flows are much higher here, which makes sampling effectively more difficult. Despite the irregular patterns in length frequencies over the decades, the overall PSS is higher in this reach (Figure 7). The higher PSS indicates an improvement in size structure of brown trout as we get into this lower reach. Catch rates of brown trout on Pine Glen WMA have increased over time and the number of brown trout caught that are 9 inches and larger has drastically increased (Figures 11 and 14). On average, overall densities of brown trout on Pine Glen WMA are lower than the other areas (Figures 11 and 14).

Rainbow trout showed similar trends as with brown trout on Pine Glen WMA, with inconsistent length frequencies throughout the decades (Figure 6). The overall PSS for rainbow trout on the Pine Glen WMA was 35, which is higher than what was calculated in the upper reaches (Figure 8). Again, as we follow the PSS from the upper to lower reaches, the PSS increases, indicating an improvement in size structure moving into the lower reaches (Figure 8). Catch rates of rainbow trout on Pine Glen WMA are ever so slightly increasing over time, but not as drastic as brown trout have been trending (Figure 11). Catch rates of rainbow trout 9 inches and larger has been sharply trending upward, like what was observed with brown trout (Figure 14).

Discussion

Despite the inconsistent stocking regimes over time, length frequency distributions have remained consistent among the decades. Rainbow trout stockings are creating more opportunity to catch bigger trout in the upper reaches as shown by the improvement in size structure and the increase in 9 inch and larger fish on Long Pine SRA and WMA. Capture success on Pine Glen WMA is being influenced by

higher flows in the lower reaches. As you move downstream, catch rates decrease while size structure improves. However, the odds of catching bigger trout are still better in the upper reaches because there are higher densities.

Figure 1.- Length frequencies of brown trout on Long Pine SRA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

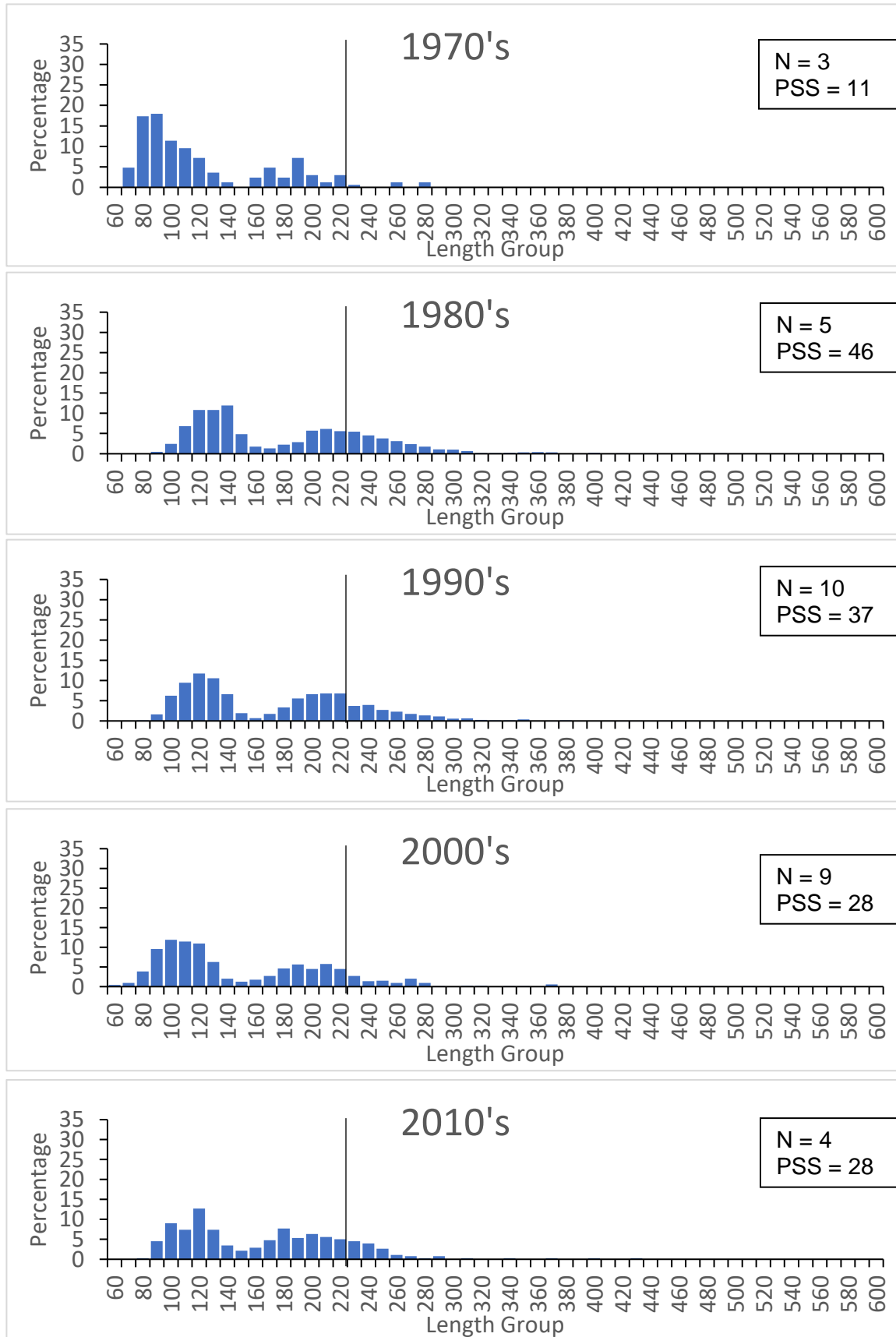


Figure 2.- Length frequencies of rainbow trout on Long Pine SRA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

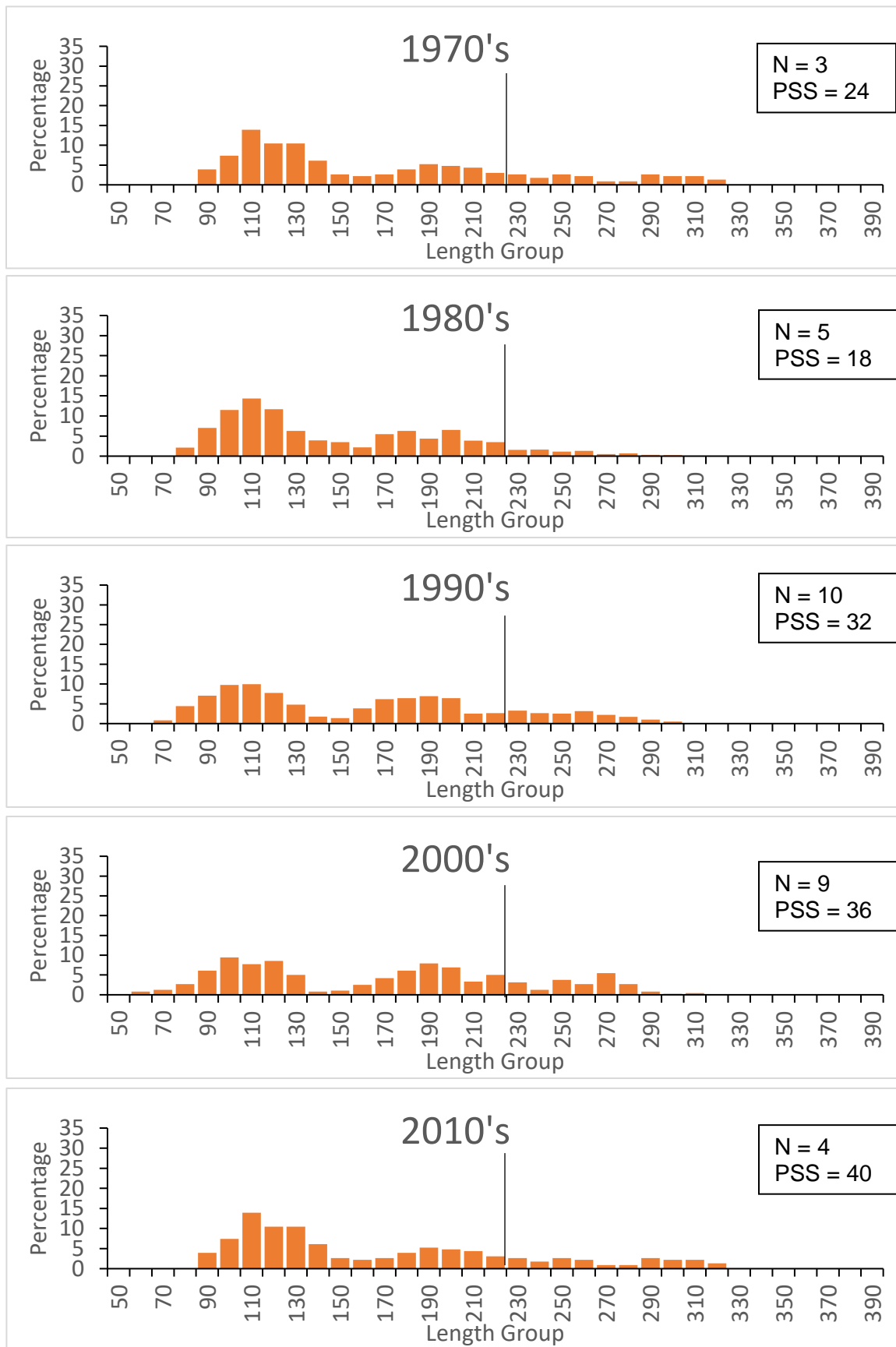


Figure 3.- Length frequencies of brown trout on Long Pine WMA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

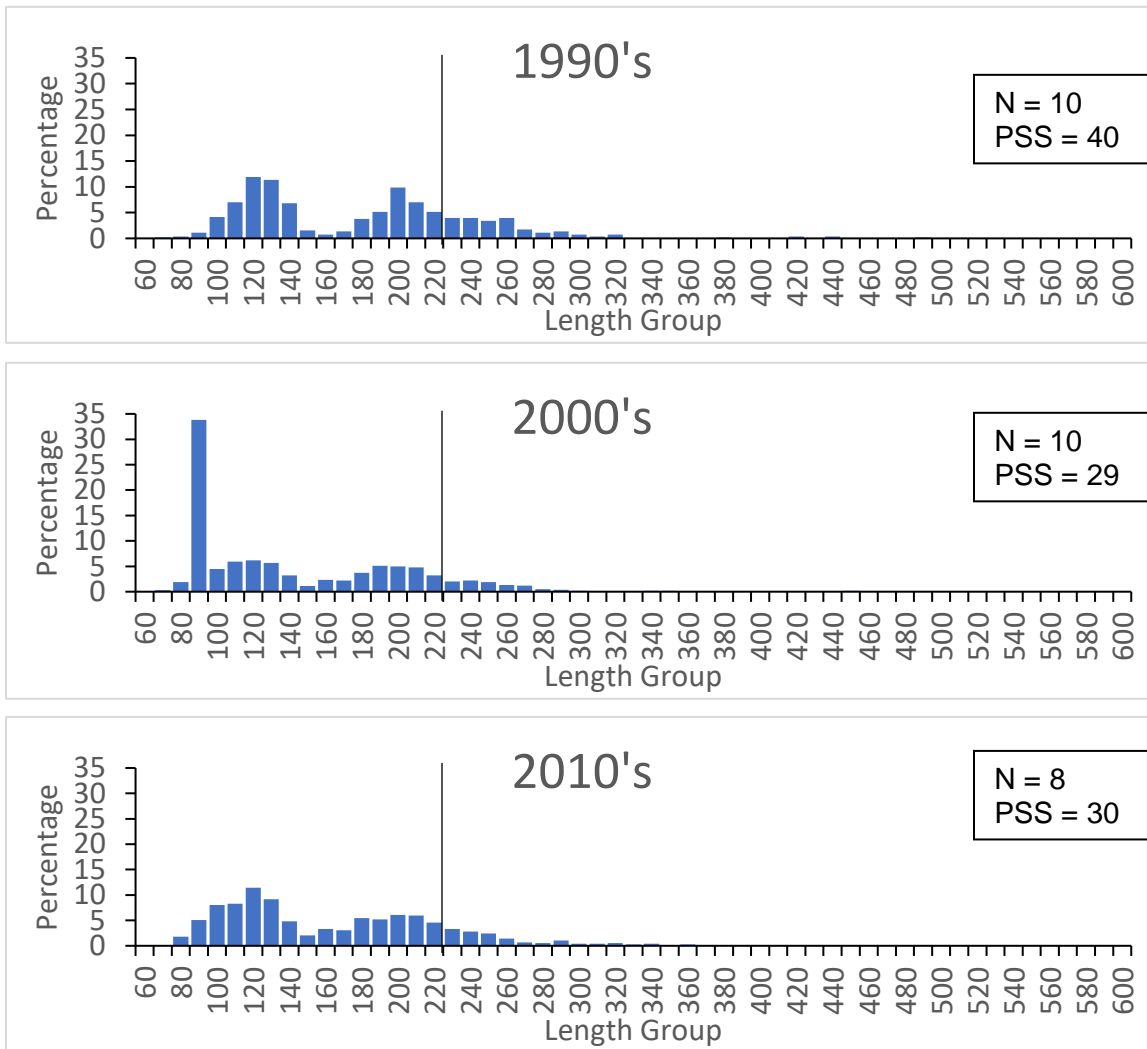


Figure 4.- Length frequencies of rainbow trout on Long Pine WMA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

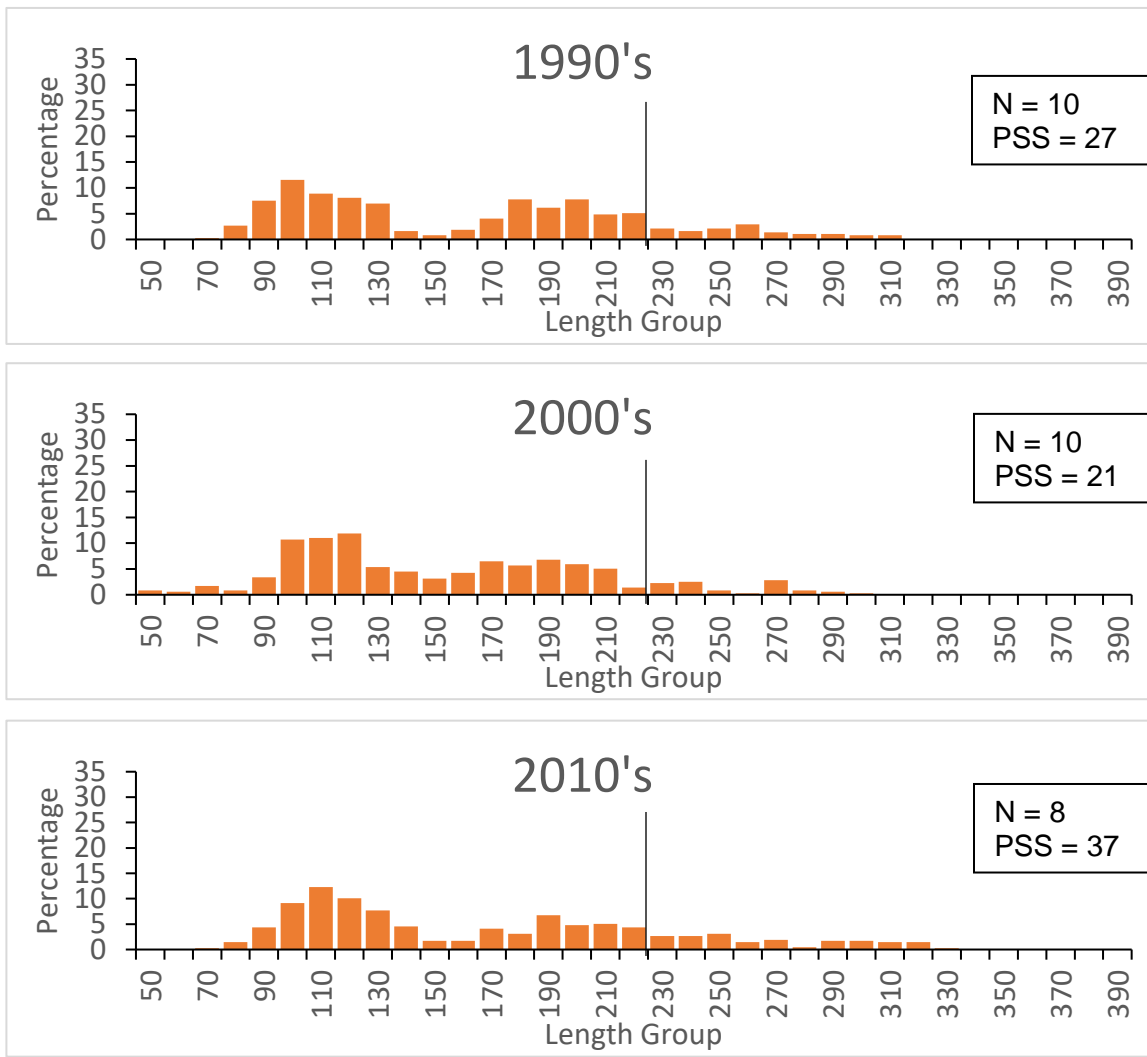


Figure 5.- Length frequencies of brown trout on Pine Glen WMA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

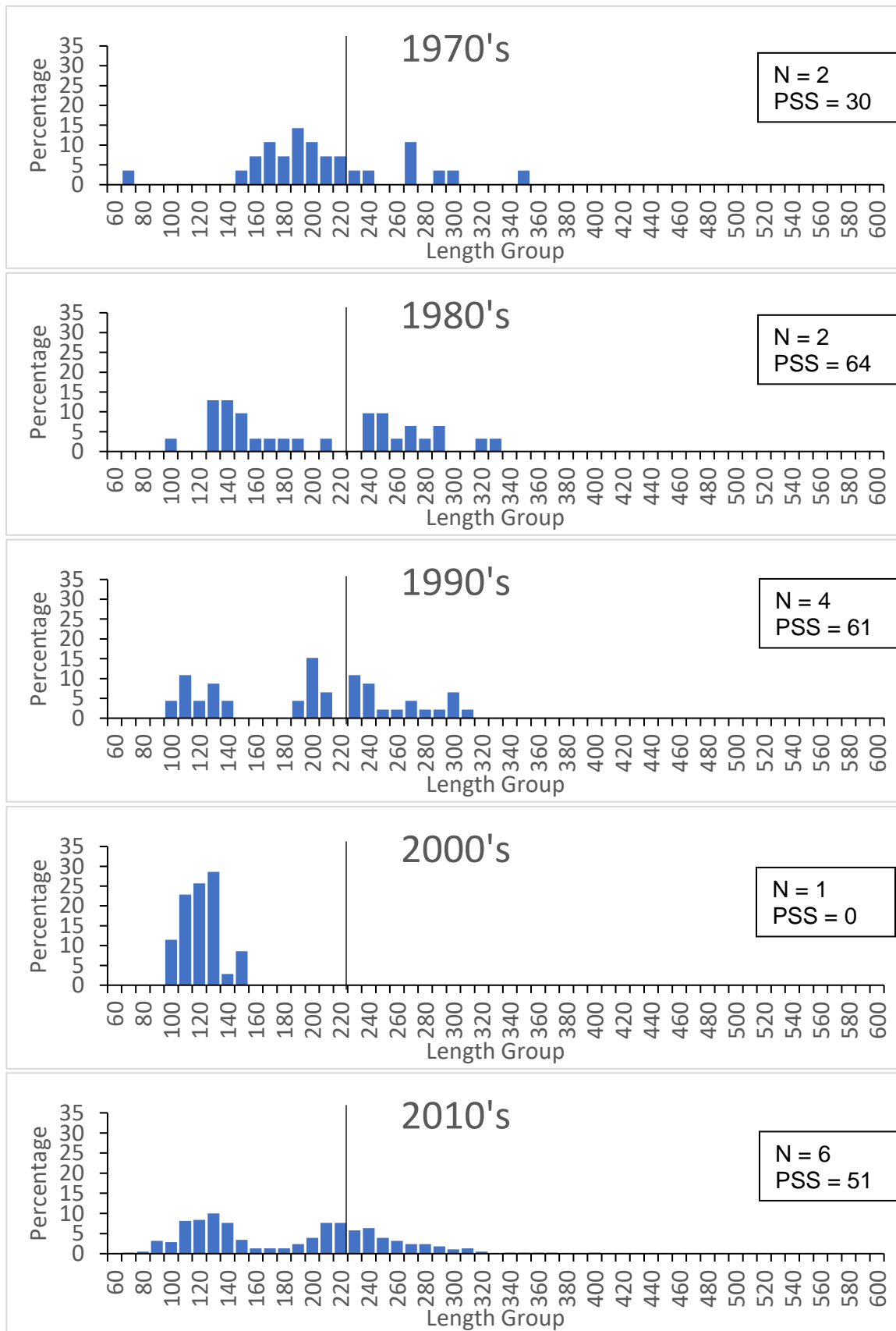


Figure 6.- Length frequencies of rainbow trout on Pine Glen WMA by decade with sample size (N) and 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

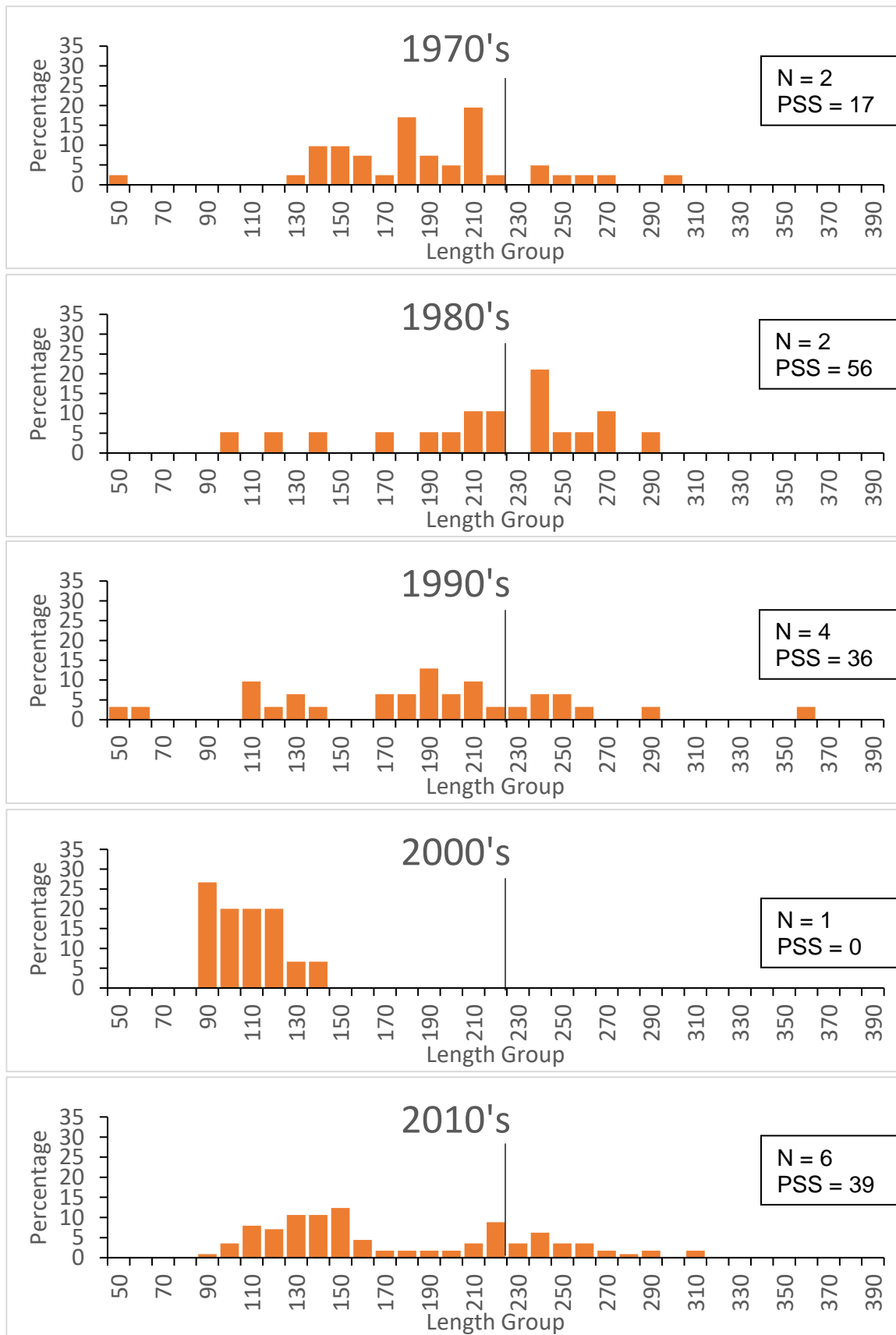


Figure 7.- Combined length frequencies of brown trout on all sampling reaches by decade with 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

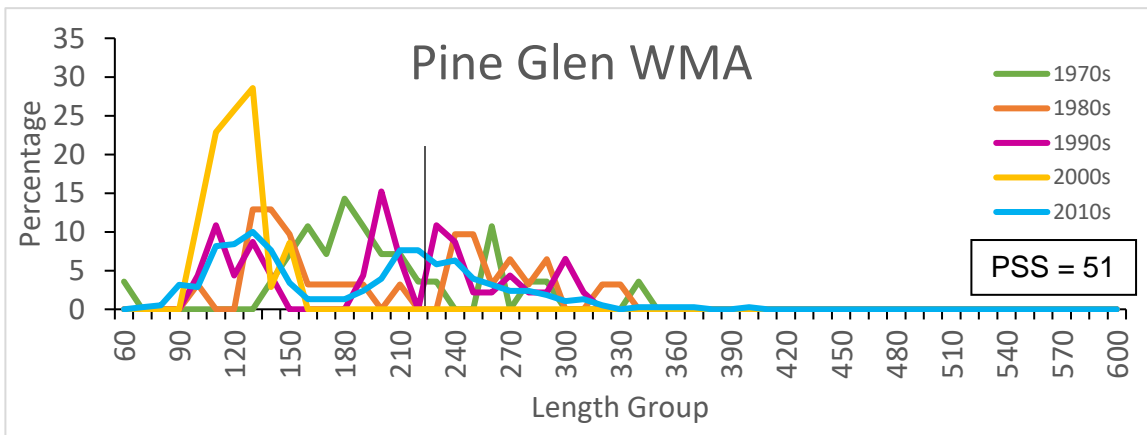
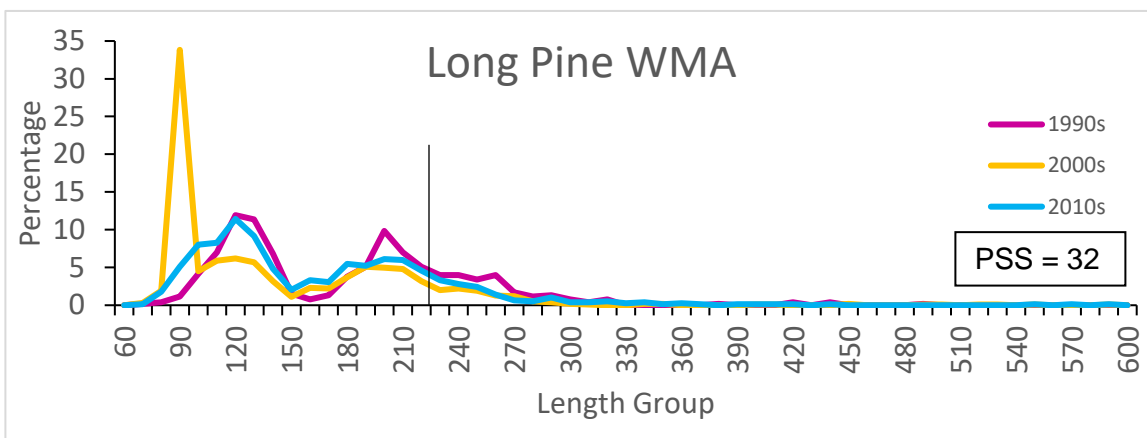
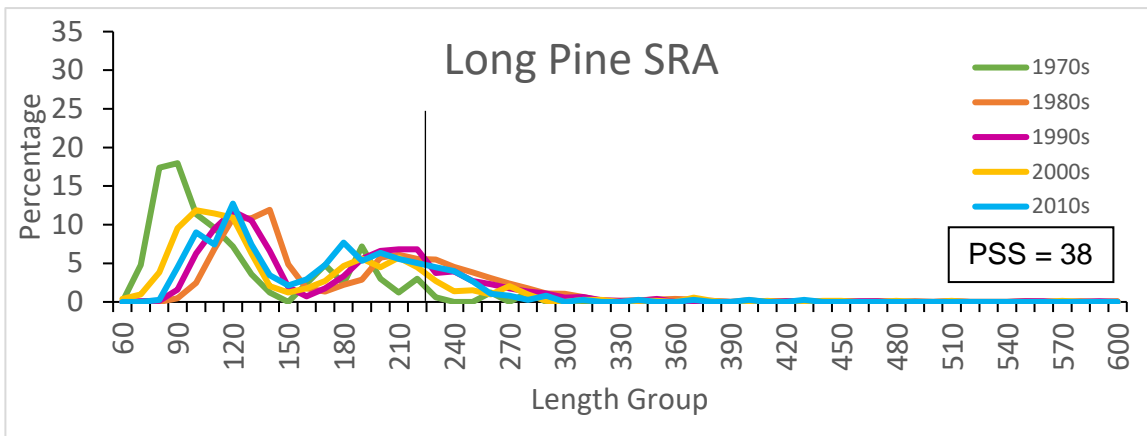


Figure 8.- Combined length frequencies of rainbow trout on all sampling reaches by decade with 9-inch calculated proportional size structure (PSS). The vertical line is the 9-inch cutoff for PSS calculations.

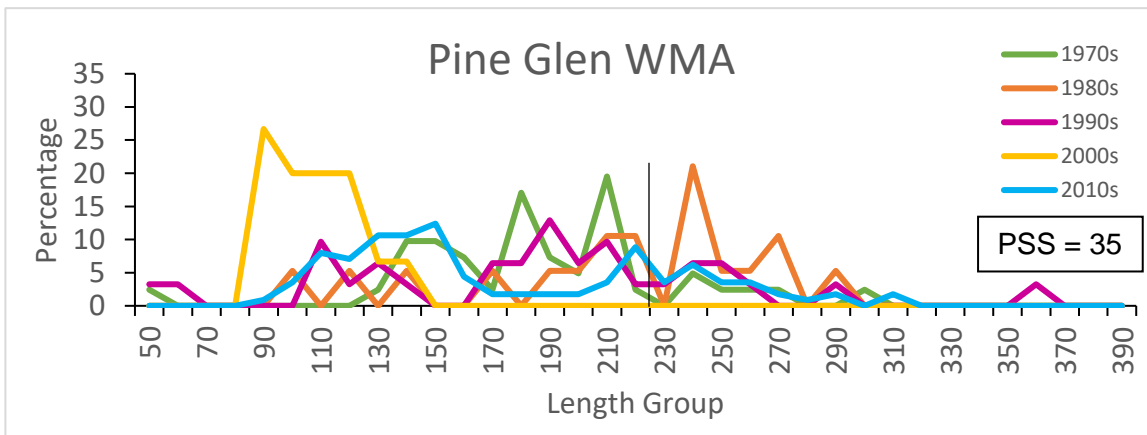
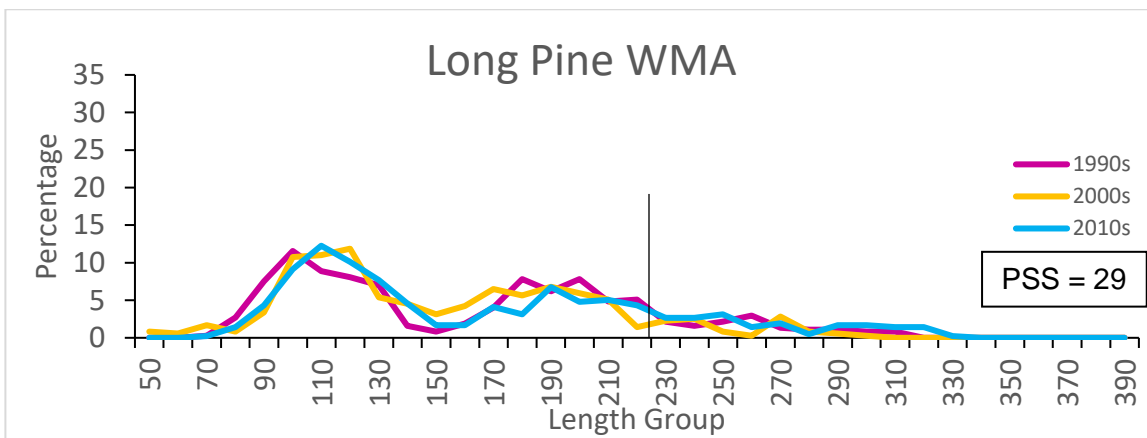
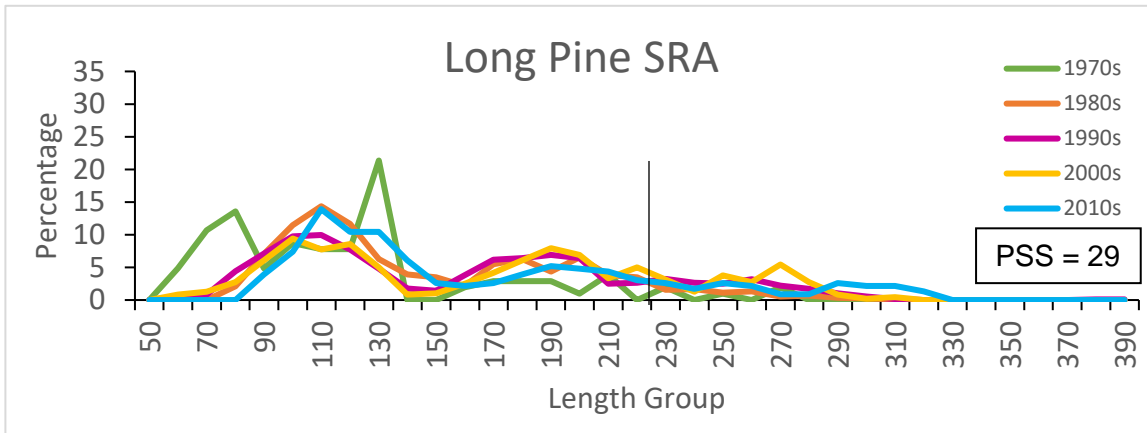


Figure 9.- Catch per unit effort (number per meter) of brown and rainbow trout on Long Pine SRA over time. Dotted line represents the trendline for each species.

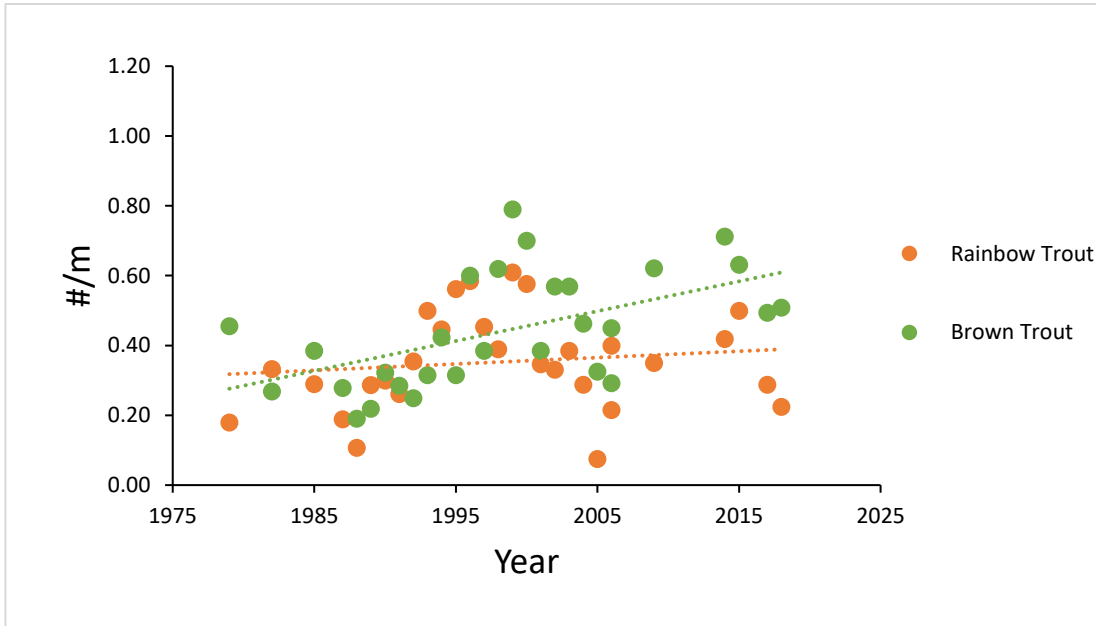


Figure 10.- Catch per unit effort (number per meter) of brown and rainbow trout on Long Pine WMA over time. Dotted line represents the trendline for each species.

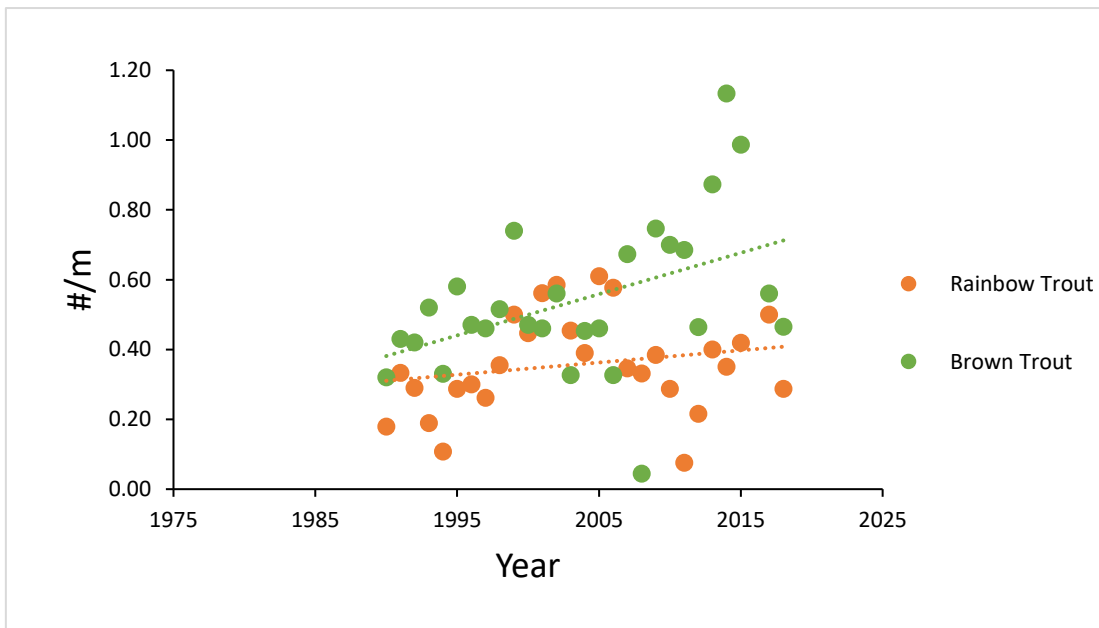


Figure 11.- Catch per unit effort (number per meter) of brown and rainbow trout on Pine Glen WMA over time. Dotted line represents the trendline for each species.

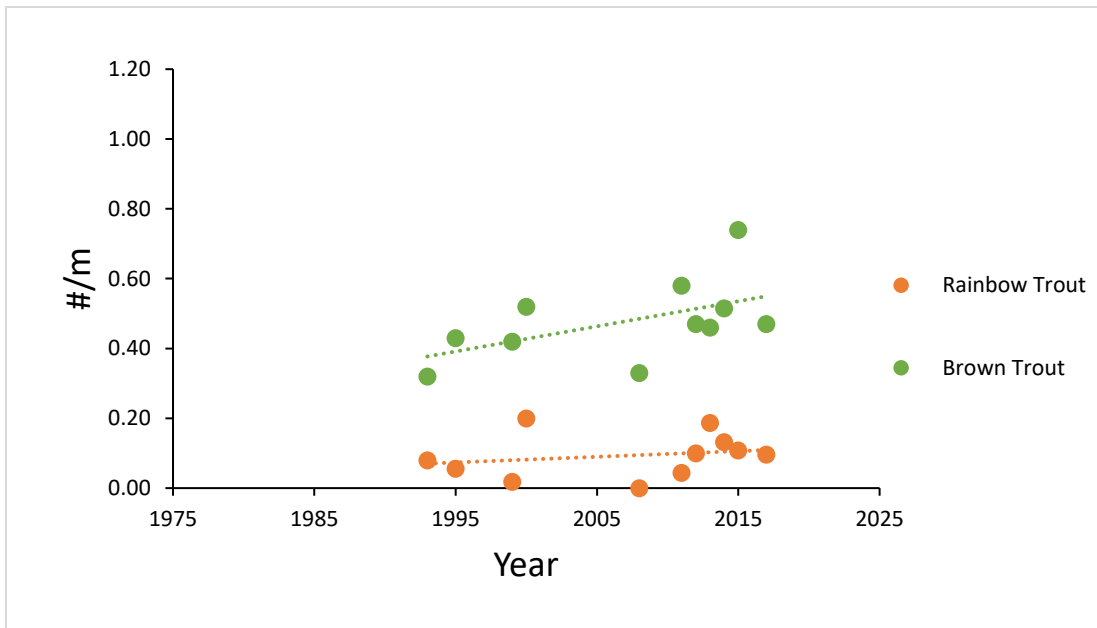


Figure 12.- Catch per unit effort (number per meter) of brown and rainbow trout 9 inches and larger on Long Pine SRA over time. Dotted line represents the trendline for each species.

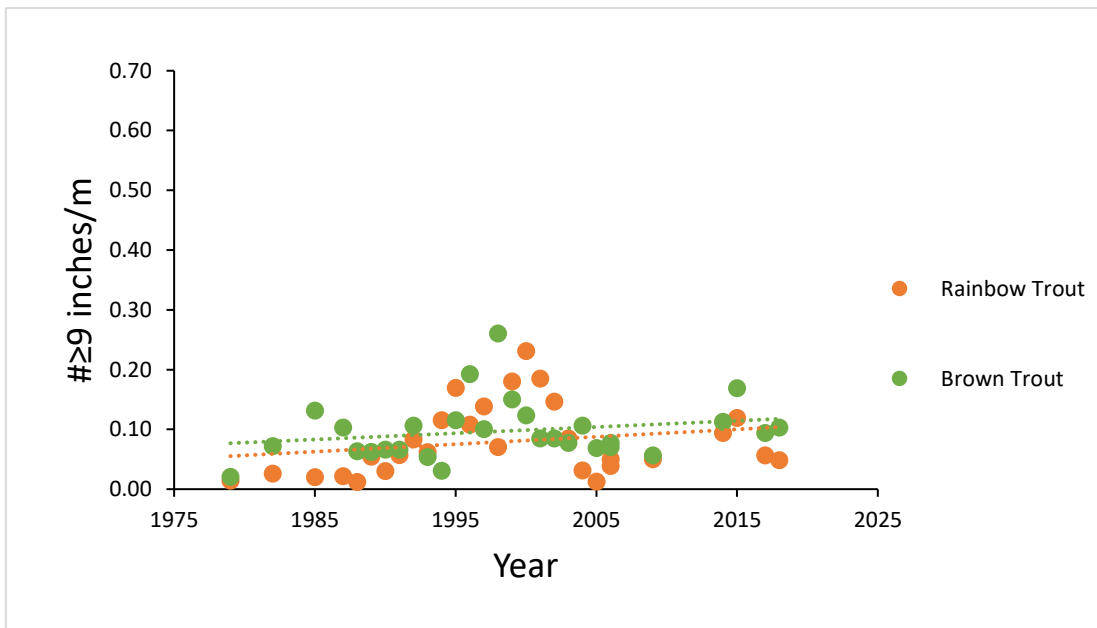


Figure 13.- Catch per unit effort (number per meter) of brown and rainbow trout 9 inches and larger on Long Pine WMA over time. Dotted line represents the trendline for each species.

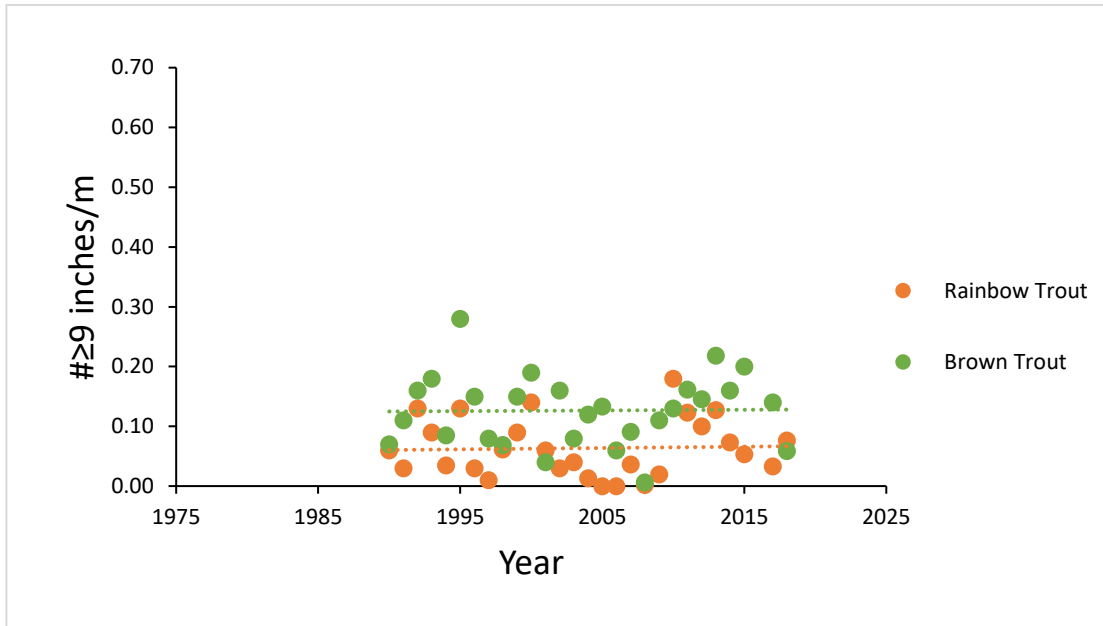
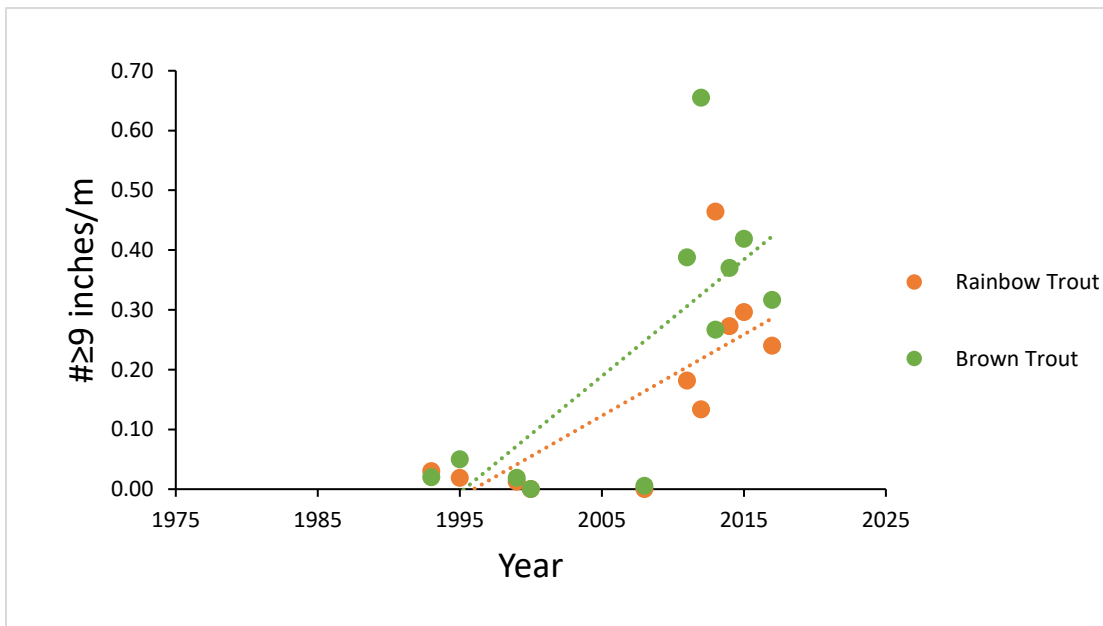


Figure 14.- Catch per unit effort (number per meter) of brown and rainbow trout 9 inches and larger on Pine Glen WMA over time. Dotted line represents the trendline for each species.



More Information

Fishing rules and regulations

Visit the Nebraska Game and Parks website at:

www.OutdoorNebraska.org

Fisheries and/or fishing opportunities in the Northeast District

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