Fisheries Division

Federal Aid Job Progress Report

Montana Statewide Fisheries Management

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Job Title: Upper Clark Fork Drainage Fisheries Management

Abstract: This report summarizes fish sampling conducted in streams of the Upper Clark Fork River Basin (not including the Clark Fork River) from 2010 through 2012. Sampling was carried out as part of the fisheries management duties of the Upper Clark Fork fisheries responsibility area located in administrative region 2.

Upper Clark Fork River Basin

Stream Fish Sampling

2010-2012

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* Histograms are organized by drainage same as above, then by stream, then by sample year starting with the earliest sample year first.

PURPOSE

This report summarizes fish sampling conducted in streams of the Upper Clark Fork River Basin from 2010 through 2012. Sampling was carried out as part of the fisheries management duties of the Upper Clark Fork fisheries responsibility area located in administrative region 2.

METHODS

Fish Sampling

Electrofishing was used to collect fish at all sites. The focus of electrofishing was primarily to assess species composition and general abundance at a broad scale. Population estimates were usually made at sites that had been previously sampled or where established population monitoring sections were located. Estimates consisted of multiple-pass (typically 2 or 3) depletion estimates on small streams (i.e. streams less than approximately 15' in width), or mark-recapture estimates on larger streams (i.e. streams greater than approximately 15' in width). Single-pass, catch-per-unit-effort (CPUE) electrofishing was used at a number of sites where little or no prior survey information was available, or where survey conditions made obtaining a population estimate difficult.

For small streams, a backpack electrofishing unit (Smith-Root LR-24) was used to sample fish in 100 m reaches (typically). At these sites, a block net was placed at the lower end of the reach to increase capture efficiency. Electrofishing was completed in a downstream direction towards the block net except at sites where high turbidity created poor visibility. In these instances, electrofishing was completed in an upstream direction, with the block net placed at the top of the reach. In larger streams, an electrofishing tote barge system (Smith-Root SR-6 w/ 2.5 GPP) was used for fish sampling. This system was more efficient at capturing fish due to its increased power output. Reaches where the tote barge system was used were longer than the standard 100 m reaches sampled in smaller streams, and were typically around 1 km in length. No block nets were utilized at sites where mark-recapture estimates were made.

At each sample reach, all captured fish were identified to species (based on phenotypic characteristics), weighed, measured and released. At depletion estimate sites, fish were held in live cages outside the section until all passes were completed. At sites were a mark-recapture estimate was made, fish captured during the marking run were given a unique fin clip before being released to allow identification during the recapture event.

Data Summary

All data collected during these sampling efforts were summarized for each sampled stream reach and were organized by drainage and stream. Each sample section was identified by a river mile (RM) that was nearest the top of the survey site. River miles

were measured beginning at the mouth of each stream and were obtained using a geographic information system (GIS) with layers obtained from the Montana Natural Resource Information System (NRIS).

Fishery data was summarized by species and included the number of fish captured at each site (first pass only for sites where multiple passes were made), catch-per-unit-effort (standardized to number of fish per 100 m of channel), mean and range of fish lengths, and percent of species composition. A table displaying this information was created for each sampled stream. Species abbreviations used in these tables are as follows: BULL = bull trout, EB = brook trout, EBxBULL = brook trout/bull trout hybrid, LL = brown trout, RB = rainbow trout, WCT = westslope cutthroat trout, WCTxRB = westslope cutthroat trout /rainbow trout hybrid. At sites where population estimates were made, an estimate value with a 95% confidence interval was reported. Population estimates were calculated using Montana Fish, Wildlife and Parks' FA+ fisheries analysis software. For depletion surveys, estimates were produced for fish greater than 75 mm in total length, whereas mark-recapture estimates were generated using a modified Petersen estimator for fish 150 mm or longer. Length-frequency histograms were produced for each sample reach where two or more fish of a given species were present. In reaches where multiple passes were made, fish of a given species were combined from all passes to produce the chart. These data are provided as an appendix (Appendix A). Only trout species were considered in these data summary efforts although observations of others species were sometimes noted in the write-ups.

RESULTS

Rock Creek Drainage (Near Garrison)

Rock Creek

Multiple-pass fish surveys were completed at two sites on Rock Creek in mid-October of 2010. The sites were located at RM 0.6 and 1.6. Both of these sites were within a segment of the stream where Fish, Wildlife and Parks has a water lease for in-stream flow during the summer. Table 1 contains a summary of results from the first electrofishing pass made through each reach.

At RM 0.6, brown trout dominated the trout community but fish numbers were relatively low (Table 1). Fish captured were of multiple age classes ranging from young of the year to relatively large adults (Table 1; Appendix A). The estimate for brown trout (> 75 mm) was 13 per 100 m (95% confidence interval: 13-14). No estimate was made for westslope cutthroat trout due to low capture numbers (Table 1). In addition to trout captured in the reach, mountain whitefish were found to be relatively common. A total of 46 were captured during the first electrofishing pass. The mean length of those fish was 192 mm (range: 97-375 mm). Sculpin and longnose dace were also noted in the reach, but were not targeted.

At RM 1.6, brown trout comprised the entire trout community (Table 1), with density being higher than at RM 0.6. Multiple ages classes were again present at this reach based on the diverse size structure of captured fish (Table 2; Appendix A). The estimate for brown trout (> 75 mm) was 42 per 100 m (95% confidence interval: 41-45). Mountain whitefish were also present in this reach, but were not as common as at RM 0.6. At RM 1.6 only nine whitefish were captured in the first electrofishing pass. The mean length of these fish was 339 mm (range: 308-366 mm). Similar to RM 0.6, sculpin and longnose dace were also noted but were not targeted.

Table 1. Electrofishing data collected at two sections on Rock Creek in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.6	LL	12	12	261	74-383	92
	WCT	1	1	346	n/a	8
RM 1.6	LL	27	27	204	81-391	100

Little Blackfoot River Drainage

Little Blackfoot River

Fish surveys were completed at several locations on the Little Blackfoot River in 2010 and 2011. In 2010, three sites were surveyed in the upper extent of the watershed in early August. Sites sampled were located at RM 34.9, 40.1, and 42.0 (Table 2). The sites at RM 34.9 and 40.1 had been previously established (in 2007), while the section at RM 42.0 was a new location. In 2011, two established population estimate sections were sampled in mid September. These sections were located at RM 9.6 and RM 21.3 (Table 3).

At RM 34.9, only one electrofishing pass was made through the sample section. Westslope cutthroat trout comprised much of the trout community with brown trout and brook trout also present, but in far fewer numbers (Table 2). At RM 40.1 multiple electrofishing passes were made through the section. Cutthroat trout continued to be the most common species in the reach, with brook trout becoming more abundant than at RM 34.9 and brown trout less so (Table 2). The estimate for westslope cutthroat trout (> 75 mm) at RM 40.1 was 37 per 100 m (95% confidence interval: 37-42). The estimate for brook trout (> 75 mm) was 18 per 100 m (95% confidence interval: 18-20), and the estimate for brown trout (> 75 mm) was 4 per 100 m (95% confidence interval: 4-4). Species composition and CPUE at RM 34.9 and 40.1 was relatively similar to what was observed previously in 2007 (Lindstrom et al. 2008). At RM 42.0 a single electrofishing pass was made through the section. Brook trout were the most abundant species with cutthroat trout also present in fair numbers, and brown trout present but rare (Table 2). Table 2 and Appendix A contain size distribution data for fish captured in each of the reaches.

Table 2. Electrofishing data collected at several sections on the Little Blackfoot River in 2010. Data presented is from the first electrofishing pass if multiple passes were made.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 34.9	WCT	28	28	154	67-274	74
	LL	9	9	222	113-358	24
	EB	1	1	104	n/a	3
RM 40.1	WCT	32	32	137	64-216	58
	LL	5	5	161	64-366	9
	EB	18	18	126	53-193	33
RM 42.0	WCT	16	16	147	63-235	35
	LL	1	1	155	n/a	2
	EB	29	29	132	71-195	63

In 2011, mark and recapture population estimates were conducted in the established monitoring sections at RM 9.6 and 21.3. These survey reaches were first sampled in 2007 and then again in 2009. Both reaches are currently on an odd year sampling schedule. At RM 9.6, brown trout dominated the trout community with westslope cutthroat trout present but very rare (Table 3). The estimate for brown trout (> 150 mm) was 981 per kilometer (+/- 102: 95% confidence interval). This estimate was noticeably higher than estimates made in 2007 and 2009, which were 629 (+/- 58: 95% confidence interval) and 623 (+/- 46: 95% confidence interval), respectively. *(Note: These values are slightly different than previously published estimates [Lindstrom et al 2008; Lindstrom 2011]. The estimates reported here were rerun using a modified Peterson estimator. This note also applies to the other estimates reported below.)* There were not enough westslope cutthroat trout captured at RM 9.6 in 2011 to do a population estimate. While an estimate was obtained in 2009, the value was very low at only 9 per kilometer. No cutthroat trout were observed in the section in 2007.

At RM 21.3, brown trout continued to dominate the trout community with westslope cutthroat trout and brook trout also present, but in much lower numbers (Table 3). The estimate for brown trout (> 150 mm) was 1,040 per kilometer (+/- 65: 95% confidence interval). This estimate was higher than estimates made in 2007 and 2009, which were 623 (+/- 60: 95% confidence interval) and 885 (+/- 61: 95% confidence interval), respectively. The estimate for westslope cutthroat trout (> 150 mm) at RM 21.3 was 72 per kilometer (+/- 17: 95% confidence interval). This estimate was noticeably higher than estimates made in 2007 and 2009, which were 10 (+/- 4: 95% confidence interval) and 25 (+/- 12: 95% confidence interval), respectively. No estimate was made for brook trout (similar to previous years) due to low numbers and relatively poor capture efficiency.

Table 3. Electrofishing data collected at two sections on the Little Blackfoot River in 2011. Data presented is from the first electrofishing pass (marking run).

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 9.6	LL	431	36	245	54-457	99
	WCT	4	<1	284	206-340	1
RM 21.3	LL	591	59	220	45-432	91
	WCT	39	4	248	160-345	6
	EB	21	2	194	110-257	3

Spotted Dog Creek

Fish surveys were completed at three new locations on Spotted Dog Creek in mid-to-late August of 2011. The sites were located at RM 6.5, 7.9 and 9.8. A single electrofishing pass was made through each section. The trout community at all sites was comprised of westslope cutthroat trout and brook trout. Westslope cutthroat trout tended to be more abundant except at RM 7.9 where high numbers of young-of-the-year brook trout skewed

the species composition. Table 4 and Appendix A contain a summary of results from each section.

Table 4. Electrofishing data collected at three sections on Spotted Dog Creek in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 6.5	WCT	46	46	169	45-298	56
	EB	36	36	132	55-209	44
RM 7.9	WCT	30	30	166	112-236	14
	EB	139*	181	88*	52-225*	86
RM 9.8	WCT	85	85	114	35-255	72
	EB	33	33	142	53-260	28

(An additional 42 brook trout less than 75 mm long were counted at RM 7.9 but were not measured. These fish are not included in the number of fish captured or in the length summaries. They are included in the CPUE and species compositions figures.)*

Spotted Dog Creek - South Fork

One single pass fish survey was completed on South Fork Spotted Dog Creek in mid-September of 2011. The site was located at RM 1.8. The trout community at this location was comprised of westslope cutthroat trout and brook trout. Brook trout appeared to be noticeably more abundant, but many of the fish present were young-of-the-year. Species composition values were roughly similar if young-of-the-year from both species were not considered. Table 5 and Appendix A contain summaries of data collected at RM 1.8 in 2011.

Table 5. Electrofishing data collected at one section on South Fork Spotted Dog Creek in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.8	WCT	69	69	150	43-265	29
	EB	167	167	111	66-292	71

Trout Creek

Fish surveys were completed at two new locations on Trout Creek in mid-August of 2011. The sites were located at RM 4.5 and 7.0. Sampling consisted of single pass surveys at each site. Westslope cutthroat trout dominated the trout community in both sections with brook trout also present but relatively uncommon. A single and relatively

large brown trout was captured at the lowest section indicating the limited presence of this species in the drainage. Table 6 and Appendix A contain summaries of data collected at each sample site.

Table 6. Electrofishing data collected at two sections on Trout Creek in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 4.5	WCT	38	38	181	136-242	88
	EB	4	4	102	67-195	9
	LL	1	1	307	n/a	2
RM 7.0	WCT	69	69	141	44-247	96
	EB	3	3	146	69-191	4

Trout Creek - Unnamed Tributary near River Mile 5.0

Single pass fish surveys were completed at three locations on an unnamed tributary to Trout Creek near RM 5.0 in mid-August of 2011. The sites were situated at RM 0.2, 1.2, and 1.8. Westslope cutthroat trout comprised most of the fish community in the stream, although two brook trout were also found in the lowest section near the confluence with Trout Creek. Table 7 and Appendix A contain summaries of data collected at each sample site.

Table 7. Electrofishing data collected at three sections on an unnamed tributary to Trout Creek near RM 5.0 in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.2	WCT	31	31	128	43-245	94
	EB	2	2	204	193-215	6
RM 1.2	WCT	52	52	99	62-196	100
RM 1.8	WCT	11	n/a	124	74-202	100

Trout Creek - Unnamed Tributary near River Mile 6.3

Single pass fish surveys were completed at two locations on an unnamed tributary to Trout Creek near RM 6.3 in mid-August of 2011. The sites were situated at RM 0.2 and 0.8. Westslope cutthroat trout comprised almost the entire fish community in the stream; however, one brook trout was collected in the lowest section near the confluence with

Trout Creek. Table 8 and Appendix A contain summaries of data collected at each sample site.

Table 8. Electrofishing data collected at two sections on an unnamed tributary to Trout Creek near RM 6.3 in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.2	WCT	33	n/a	152	40-245	97
	EB	1	n/a	78	n/a	3
RM 0.8	WCT	10	n/a	124	34-212	100

Trout Creek - Unnamed Tributary near River Mile 8.4

One single pass fish survey was completed on an unnamed tributary to Trout Creek near RM 8.4 in late August of 2011. The sample location was situated at RM 1.4 near the upper extent of the small drainage. Westslope cutthroat trout comprised the entire fish community at this site. Fish numbers were relatively high, although many tended to be small juveniles likely one year of age. Table 9 and Appendix A contain summaries of data collected at the sample site.

Table 9. Electrofishing data collected at one section on an unnamed tributary to Trout Creek near RM 8.4 in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.4	WCT	90	90	100	30-205	100

Telegraph Creek

Multiple-pass fish surveys were completed at two locations on Telegraph Creek between mid-September and early October of 2012. The sites were located at RM 3.6 and 4.9. Both of the sections had been previously sampled with single-pass surveys in 2007 (Lindstrom et al. 2008). At RM 3.6 westslope cutthroat trout appeared to be more common than brook trout, but many of the fish collected tended to be small and of younger age (Table 10; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) at RM 3.6 was 54 per 100 m (95% confidence interval: 52-58). The estimate for brook trout (> 75 mm) was similar at 51 per 100 m (95% confidence interval: 50-54). At RM 4.9 brook trout were more abundant than westslope cutthroat trout, but a fair number of fish of both species were of younger age classes less than 100 mm in total length (Table 10; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) at RM 4.9 was 50 per 100 m (95% confidence interval: 49-53), while the estimate for brook trout (>

75 mm) was slightly greater at 65 per 100 m (95% confidence interval: 65-66). Table 10 and Appendix A contain summaries of data collected at each sample site.

Table 10. Electrofishing data collected at two sections on Telegraph Creek in 2012. Data presented is from the first electrofishing pass through each section.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 3.6	WCT	55	55	93	38-197	60
	EB	37	37	119	55-193	40
RM 4.9	WCT	55	55	100	43-215	38
	EB	89	89	108	43-194	62

Hat Creek

Single-pass fish surveys were completed at two locations on Hat Creek in early August of 2010. The sites were located at RM 0.6 and 1.0. A diversion-like structure was found at RM 0.6 and appeared to be at least a partial barrier to upstream movement. Westslope cutthroat trout comprised much of trout community at both sample locations, with brook trout present but in noticeably lower density. This was especially true at the upper site. A single, juvenile brown trout was captured at the lower sample location indicating the limited presence of this species in the stream as well. Table 11 and Appendix A contain summaries of data collected at each sample site.

Table 11. Electrofishing data collected at two sections of Hat Creek in 2010.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.6	WCT	48	48	117	70-187	72
	EB	18	18	132	102-208	27
	LL	1	1	122	n/a	1
RM 1.0	WCT	78	78	98	44-179	97.5
	EB	2	2	123	102-143	2.5

Ontario Creek

Multiple-pass fish surveys were completed at two locations on Ontario Creek in mid-September of 2012. The sites were located at RM 1.3 and 2.9. Both of the sections had been previously sampled with single-pass surveys in 2007 (Lindstrom et al. 2008). At RM 1.3 westslope cutthroat trout dominated the species composition in the stream, with brook trout present but in lower numbers. The estimate for westslope cutthroat trout (> 75 mm) at RM 1.3 was 45 per 100 m (95% confidence interval: 45-47), while the estimate

for brook trout (> 75 mm) was noticeably less at 9 per 100 m (95% confidence interval: 9-10). At RM 2.9 cutthroat trout continued to be the more common species, but brook trout were more abundant than at RM 1.3. The estimate for westslope cutthroat trout (> 75 mm) at RM 2.9 was 70 per 100 m (95% confidence interval: 67-75), while the estimate for brook trout (> 75 mm) was half that at 35 per 100 m (95% confidence interval: 35-35). Table 12 and Appendix A contain summaries of data collected at each sample site.

Table 12. Electrofishing data collected at two sections on Ontario Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.3	WCT	43	43	126	32-194	80
	EB	11	11	111	52-216	20
RM 2.9	WCT	62	62	89	35-166	57
	EB	47	47	113	54-187	43

Bison Creek

One multiple-pass fish survey was completed on Bison Creek in early October of 2012. The sample location was situated at RM 0.1 near the confluence with Ontario Creek. Westslope cutthroat trout comprised most of the fish community, with brook trout also present but in relatively low numbers. The estimate for westslope cutthroat trout (> 75 mm) was 46 per 100 m (95% confidence interval: 44-51), while the estimate for brook trout (> 75 mm) was only 14 per 100 m (95% confidence interval: 14-15). Table 13 and Appendix A contain summaries of data collected at each sample site.

Table 13. Electrofishing data collected at one section on Bison Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.1	WCT	48	48	86	35-166	79
	EB	13	13	115	54-187	21

O' Neill Creek Drainage

O' Neill Creek

Single-pass fish surveys were completed at three locations on O'Neill Creek in early August of 2011. The sites were located at RM 1.5, 2.9, and 3.1. The sites at RM 2.9 and 3.1 were new locations, while the site at RM 1.5 was established in 2009 (Lindstrom 2011). Westslope cutthroat trout comprised the entire fish community at the two lower sites, but no fish were found at the uppermost location. A steep cascade and waterfall was identified at approximately RM 3.0 that appeared to be a complete upstream barrier to fish movement. Fish numbers and size structure at RM 1.5 were relatively similar to what was observed in 2009, although no young-of-the-year were noted in 2011 because the sample time was almost a month earlier and fish had yet to emerge. Fish density at RM 2.9 was very high given that O'Neill Creek is a relatively small stream. Table 14 and Appendix A contain summaries of data collected at each sample site.

Table 14. Electrofishing data collected at three sections of O'Neill Creek in 2011.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.5	WCT	30	30	129	90-214	100
RM 2.9	WCT	131	131	118	38-250	100
RM 3.1	n/a	No Fish	0	n/a	n/a	n/a

Freezeout Creek Drainage

Freezeout Creek

One single-pass fish survey was completed on Freezeout Creek in late August of 2012. The site was situated at RM 2.9. Both westslope cutthroat trout and brook trout were present in the reach, and both species appeared to occur in roughly equal numbers. Average size of both species was relatively small, which was indicative of the dominance of young-of-the-year in the sample. Table 15 and Appendix A contain summaries of data collected at the sample site.

Table 15. Electrofishing data collected at one section on Freezeout Creek in 2012.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 2.9	WCT	49	49	70	36-227	53
	EB	44	44	97	59-224	47

Jake Creek

One single-pass fish survey was completed on Jake Creek in late August of 2012. The site was located at RM 2.9. Westslope cutthroat trout were the only species present in the reach, with fish numbers being moderately low. Multiple age classes of fish were identified including resident size adults as well as young-of-the-year. Table 16 and Appendix A contain summaries of data collected at the sample site.

Table 16. Electrofishing data collected at one section on Jake Creek in 2012.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 4.1	WCT	22	22	116	20-169	100

Fred Burr Creek Drainage

Fred Burr Creek

In 2011, a spot electrofishing check was completed on lower Fred Burr Creek where it intersects Sam Beck Road near RM 1.6. The large pool below the culvert was sampled to determine fish presence. The fish community was dominated by non-game species including longnose suckers, largescale suckers and redside shiners. In addition to the high densities of these species, two westslope cutthroat trout (total lengths: 185mm & 290mm) were also observed. It appears that upper and lower Fred Burr Creek are disconnected. Several irrigation diversions originating from the Cottonwood Creek drainage likely provide much of the flow to lower Fred Burr Creek. It is likely the cutthroat trout observed at Sam Beck Road came from the Cottonwood Creek drainage.

In 2012, one single-pass fish survey was completed on upper Fred Burr Creek in late August of 2012. The site was located near RM 6.5. Both westslope cutthroat trout and brook trout were present in the reach, and both species appeared to occur in roughly equal numbers. However, larger fish were uncommon and subsequently, average size of both species was relatively small. Many of the fish captured were one year of age or less. Table 17 and Appendix A contain summaries of data collected at the sample site.

Table 17. Electrofishing data collected at one section on Fred Burr Creek in 2012.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 6.5	WCT	39	39	85	25-143	56
	EB	31	31	72	51-175	44

Cottonwood Creek Drainage

Cottonwood Creek

Multiple-pass fish surveys were completed at two locations on Cottonwood Creek in early September of 2012. The sites were located at RM 3.0 and 6.9. Both of the sections had been previously sampled with single-pass surveys in 2007 (Lindstrom et al. 2008). At RM 3.0 brook trout dominated the species composition in the stream, with brown trout also present but rare. The estimate for brook trout (> 75 mm) at RM 3.0 was 33 per 100 m (95% confidence interval: 33-35), while the estimate for brown trout (> 75 mm) was noticeably less at 3 per 100 m (95% confidence interval: 3-3). At RM 6.9 westslope cutthroat trout were the most common species, with brook trout also present in slightly lesser numbers. However, many of the brook trout captured in the reach were young-of-the-year. The estimate for westslope cutthroat trout (> 75 mm) at RM 6.9 was 77 per 100 m (95% confidence interval: 73-84), while the estimate for brook trout (> 75 mm) was only 15 per 100 m (95% confidence interval: 15-17). Table 18 and Appendix A contain summaries of data collected at each sample site on Cottonwood Creek in 2012. When compared to data from 2007, findings were relatively similar at both sites. The most notable difference was that brook trout of older age classes were less common at RM 6.9 in 2012 than in 2007. While the reason for this is not well understood, record flood flows in Cottonwood Creek during 2011 may have had a greater impact on nonnative brook trout than on native westslope cutthroat trout.

Table 18. Electrofishing data collected at two sections on Cottonwood Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 3.0	EB	23	23	117	80-201	88
	LL	3	3	111	88-157	12
RM 6.9	WCT	64	64	111	39-256	60
	EB	42	42	84	46-185	40

South Fork Cottonwood Creek

One fish survey was completed on South Fork Cottonwood Creek in 2012. The site was located at RM 1.3, which was first sampled with a single-pass survey in 2007 (Lindstrom et al. 2008). Westslope cutthroat trout comprised the entire trout community at this site as was the case in 2007. The estimate for this species (> 75 mm) was 28 per 100 m (95% confidence interval: 28-30). Table 19 and Appendix A contain summaries of data collected on South Fork Cottonwood Creek in 2012. When compared to first pass data from 2007, more than twice as many fish were captured in 2012. The bulk of the fish making up the difference were young juveniles that were approximately 1 year old. This could have been a result of increased spawning success due to better than average water

conditions in 2011, or simply a change in habitat conditions in the reach that increased juvenile rearing habitat.

Table 19. Electrofishing data collected at one section on South Fork Cottonwood Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.3	WCT	44	44	81	38-144	100

North Fork Cottonwood Creek

One fish survey was completed on North Fork Cottonwood Creek in 2012. The site was located at RM 0.3, which was first sampled with a single-pass survey in 2007 (Lindstrom et al. 2008). At that time, westslope cutthroat trout comprised the bulk of the trout community at this site, with brook trout present but very rare. In 2012, westslope cutthroat trout were still the most common species, but brook trout appeared to be much more common than in 2007, comprising 41% of the trout captured on the first pass (Table 20). The majority of the brook trout captured were young juveniles approximately 1 year or less in age. Further monitoring is warranted to determine if brook trout are truly expanding in North Fork Cottonwood Creek or if our two sample periods are on the ends of natural variability. The estimate for westslope cutthroat trout (> 75 mm) at RM 0.3 was 33 per 100 m (95% confidence interval: 33-37), while for brook trout (> 75 mm) it was 6 per 100 m (95% confidence interval: 6-6). Table 20 and Appendix A contain summaries of data collected on North Fork Cottonwood Creek in 2012.

Table 20. Electrofishing data collected at one section on North Fork Cottonwood Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.3	WCT	30	30	108	41-229	59
	EB	21	21	84	49-192	41

Middle Fork Cottonwood Creek

One fish survey was completed on Middle Fork Cottonwood Creek in 2012. The site was located at RM 0.7, which was first sampled with a single-pass survey in 2007 (Lindstrom et al. 2008). Westslope cutthroat trout comprised the entire trout community at this site as was the case in 2007. The estimate for this species (> 75 mm) was 70 per 100 m (95% confidence interval: 68-74). Table 21 and Appendix A contain summaries of data collected on Middle Fork Cottonwood Creek in 2012. The number and average size of fish captured in 2012 was relatively similar to what was observed in 2007.

Table 21. Electrofishing data collected at one section on Middle Fork Cottonwood Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.7	WCT	64	64	114	35-227	100

Baggs Creek

Fish surveys were completed at four locations on Baggs Creek in late August and early September of 2012. The sites were located at RM 0.6, 2.5, 5.1, and 5.4. The sites at RM 0.6 and 5.4 were first sampled with single-pass surveys in 2007 (Lindstrom et al. 2008); however, it should be noted that the lower site was moved slightly upstream from its original location, which was closer to RM 0.5. The site at RM 2.5 was first sampled with a single-pass survey in 2008 (Liermann et al. 2009), and the site at RM 5.1 was a new sample location situated downstream of a natural waterfall, which was noted during 2007 sampling and appeared to be a complete upstream migration barrier.

At RM 0.6 westslope cutthroat trout and brook trout appeared in similar numbers; however, all of the brook trout captured were small juveniles whereas the westslope cutthroat trout were of multiple age classes that included juveniles and resident size adults (Table 22; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) at RM 0.6 was 56 per 100 m (95% confidence interval: 56-57), while the estimate for brook trout (> 75 mm) was 85 per 100 m (95% confidence interval: 82-90). First pass numbers for each species when compared to data from 2007 indicated that brook trout were slightly more common, while cutthroat trout were much more common. It is unknown whether movement of the sample reach upstream affected the observed differences, or if the apparent increases in density were associated with recent better than average water years.

At RM 2.5 westslope cutthroat trout dominated the species composition, with brook trout also present, but in far lesser numbers (Table 22; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) was relatively high at 121 per 100 m (95% confidence interval: 117-127), while the estimate for brook trout (> 75 mm) was much lower at 16 per 100 m (95% confidence interval: 16-17). In addition to being quite abundant, several westslope cutthroat trout were observed to be fairly large for the size of the stream (Table 22; Appendix A). When compared to data collected in 2008, cutthroat trout appeared to be noticeably more abundant, while brook trout density appeared to have changed relatively little (Liermann et al. 2009).

At RM 5.1, westslope cutthroat trout comprised almost the entire fish community, with brook trout also present but rare (Table 22; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) was high at 125 per 100 m (95% confidence interval: 125-137),

while the estimate for brook trout (> 75 mm) was only 2 per 100 m (95% confidence interval: 2-2). Average fish size at this reach tended to be greater than others sampled (Table 22; Appendix A).

At RM 5.4, westslope cutthroat trout were the only fish species present in Baggs Creek. Fish density was quite high, and while young juveniles dominated the catch, fish from multiple age classes were present in the reach (Table 22; Appendix A). The estimate for westslope cutthroat trout (> 75 mm) at RM 5.4 was 150 per 100 m (95% confidence interval: 142-159). When compared to single pass data collected in 2007, fish density in the reach appeared to be up, similar to all of the other reaches sampled in Baggs Creek in 2012.

Table 22. Electrofishing data collected at four sections on Baggs Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.6	WCT	65	65	94	40-214	48
	EB	70	70	80	60-97	52
RM 2.5	WCT	118	118	114	38-300	74
	EB	42	42	99	35-233	26
RM 5.1	WCT	112	112	140	37-277	98
	EB	2	2	192	182-201	2
RM 5.4	WCT	104	104	109	68-268	100

Warm Springs Creek Drainage

Warm Springs Creek

Fish surveys were completed at several locations on Warm Springs Creek in mid-August of 2010 and mid-September of 2011. In 2010, two sites were surveyed in the upper extent of the watershed at RM 27.4 and 29.1 (Table 23). Both sites had been previously sampled (Lindstrom et al. 2008). In 2011, one population estimate section near the mouth was surveyed. This section was located at RM 1.8 (Table 24) and had been previously sampled in 2007 (Lindstrom et al. 2008) and 2008 (Liermann et al. 2009).

At RM 27.4, bull trout were the most common species present in the reach followed by westslope cutthroat trout and brook trout (Table 23). All of the bull trout captured were relatively small sub-adults whereas the cutthroat and brook collected were from a broader diversity of age classes (Table 23; Appendix A). The estimate for bull trout (> 75 mm) was 46 per 100 m (95% confidence interval: 38-60), while for westslope cutthroat trout

(> 75 mm) it was 19 per 100 m (95% confidence interval: 19-19). The estimate for brook trout (> 75 mm) was 10 per 100 m (95% confidence interval: 10-10). A single phenotypic brook trout-bull trout hybrid was also noted in the reach during 2010 sampling. When compared to the single-pass data collected in 2007, species composition and fish density at RM 27.4 appeared similar and was likely within the range of natural variation. What was different however, was the size structure of bull trout collected in the reach. In 2007 all of the bull trout captured were of a similar age class as was the case in 2010, but fish in 2007 tended to be larger with all being greater than 200mm in length. It is unknown why smaller fish were not found in 2007 and why larger fish were absent in 2010. It may be an indication of poor survival or lack of recruitment in some years.

At RM 29.1, the entire fish community was comprised of bull trout and westslope cutthroat trout (Table 23). Densities were relatively similar for each species. The estimate for bull trout (> 75 mm) was 25 per 100 m (95% confidence interval: 25-26), while for westslope cutthroat trout (> 75 mm) it was 18 per 100 m (95% confidence interval: 18-19). All of the bull trout observed were larger sub-adults or adults with a resident life history, as were many of the cutthroat trout (Table 23; Appendix A). A number of juvenile westslope cutthroat trout were also captured in the reach, but there appeared to be gaps in the age structure indicative of poor recruitment in some years (Appendix A). When compared to single-pass data collected in 2007, numbers of both species appeared to be up, especially for bull trout. However, overall densities were still somewhat low and could be related to marginal habitat quality due to high sedimentation and relatively low summer flows.

Table 23. Electrofishing data collected at two sections on Warm Springs Creek in 2010. Data presented is from the first electrofishing pass. (* Fish was not captured on the first electrofishing pass).

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 27.4	WCT	17	17	170	92-263	36
	BULL	20	20	109	91-131	43
	EB	9	9	166	98-256	19
	EBxBULL*	1	1	255	n/a	2
RM 29.1	WCT	14	14	162	63-221	47
	BULL	16	16	183	159-206	53

At RM 1.8, a mark and recapture population estimate was conducted at the established monitoring section. Brown trout, which had an average size of 206 mm, dominated the trout community with westslope cutthroat trout also present but very rare (Table 24; Appendix A). The estimate for brown trout (> 150 mm) was 499 per kilometer (+/- 47: 95% confidence interval). This estimate was lower than estimates made in 2007 and 2008, which were 839 (+/- 62: 95% confidence interval) and 709 (+/- 44: 95% confidence interval) per kilometer, respectively. *(Note: These values are slightly different than*

previously published estimates [Lindstrom et al. 2008; Liermann et al. 2009]. The estimates reported here were rerun using a Modified Peterson estimator.) There were not enough westslope cutthroat trout captured at RM 1.8 to do a population estimate, which was the same as previous sample years. With regard to the drop in brown trout density observed in 2011, there are at least two possible explanations for why this could have occurred. However, the exact reason remains unknown. Severe ice buildup during the winter of 2010-2011 was observed in the reach and lead to severe wintertime flooding outside the channel. Several areas of the channel observed during this event appeared to be dry or nearly so and could have lead to significant fish movement or mortality. Additionally, extremely high spring flows in 2011 caused severe flooding throughout much of lower Warm Springs Creek during the run-off period. Within the established monitoring reach at RM 1.8, a large and complex meander was cut-off, shortening the overall sample reach by 100 meters. Either or a combination of these natural events could have lead to fish mortality or the redistribution of fish in lower Warm Springs Creek.

Table 24. Electrofishing data collected at one section on Warm Springs Creek in 2011. Data presented is from the first electrofishing pass (marking run).

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.8	LL	291	32	206	62-540	99
	WCT	3	<1	257	212-322	1

West Fork Warm Springs Creek

One fish survey was completed on West Fork Warm Springs Creek in Mid-August of 2010. The site was located at RM 1.0, which was first sampled with a single-pass survey in 2007 (Lindstrom et al. 2008). Westslope cutthroat trout and bull trout comprised the entire trout community at this site as was the case in 2007. However, in 2007 bull trout appeared to be more common than cutthroat trout whereas in 2010, the opposite was true. The estimate for westslope cutthroat trout (> 75 mm) was 24 per 100 m (95% confidence interval: 24-25), and for bull trout (> 75 mm) it was 17 per 100 m (95% confidence interval: 17-18). Table 25 and Appendix A contain summaries of data collected on West Fork Warm Springs Creek in 2010. When compared to first pass data from 2007, about half as many bull trout were captured in 2010, while cutthroat numbers were very similar. When average size of bull trout captured were compared between the sample periods it suggests that recruitment may not be very consistent or good in West Fork Warm Springs Creek. In 2007 most of the bull trout captured were relatively young juveniles. However, in 2010, few of these size fish were captured. Instead, almost all of the fish were approximately 150 mm or greater in size.

Table 25. Electrofishing data collected at one section on West Fork Warm Springs Creek in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.0	WCT	27	27	129	47-223	64
	BULL	15	15	157	77-223	36

Barker Creek

Fish surveys were completed at three locations on Barker Creek in late August of 2010. The sites were located at RM 0.5, 1.6, and 2.9. All of the sites were previously sampled in 2007 (Lindstrom et al. 2008). Table 26 and Appendix A contain summaries of data collected on Barker Creek in 2010. At all of the sections, bull trout dominated the fish community, the same as was observed in 2007. A population estimate was not made at RM 0.5 as only a single electrofishing pass was made through the section. At RM 1.6, the estimate for bull trout (> 75 mm) was 30 per 100 m (95% confidence interval: 30-32), and for westslope cutthroat trout (> 75 mm) it was 5 per 100 m (95% confidence interval: 5-5). At RM 2.9, the estimate for bull trout (> 75 mm) was 31 per 100 m (95% confidence interval: 31-33), and for westslope cutthroat trout (> 75 mm) it was 11 per 100 m (95% confidence interval: 11-12). Additionally, a single phenotypic westslope cutthroat trout – rainbow trout hybrid was also observed in the section (Table 26).

Table 26. Electrofishing data collected at three sections on Barker Creek in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.5	WCT	3	3	172	105-236	14
	BULL	18	18	163	88-269	86
RM 1.6	WCT	5	5	199	146-275	16
	BULL	26	26	170	91-272	84
RM 2.9	WCT	9	9	151	100-242	25
	WCTxRB	1	1	180	n/a	3
	BULL	26	26	157	107-262	72

Twin Lakes Creek

Fish surveys were completed at two locations on Twin Lakes Creek in late August of 2010. The sites were located at RM 2.8 and 4.7. Both sites were previously sampled in 2007 (Lindstrom et al. 2008). Table 27 and Appendix A contain summaries of data collected on Twin Lakes Creek in 2010. Westslope cutthroat trout and brook trout

comprised the entire trout community at both sites, with cutthroat trout tending to be slightly more common. This pattern was also observed in 2007. At RM 2.8, the estimate for westslope cutthroat trout (> 75 mm) was 43 per 100 m (95% confidence interval: 42-46), and for brook trout (> 75 mm) it was 24 per 100 m (95% confidence interval: 24-25). At RM 4.7, the estimate for westslope cutthroat trout (> 75 mm) was 21 per 100 m (95% confidence interval: 20-25), and for brook trout (> 75 mm) it was 9 per 100 m (95% confidence interval: 9-10). When first pass data from 2010 was compared to that from 2007, there was relatively little difference in species composition and density suggesting little change in the fishery between the two sample periods.

Table 27. Electrofishing data collected at two sections on Twin Lakes Creek in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 2.8	WCT	29	29	149	65-240	58
	EB	21	21	144	46-259	42
RM 4.7	WCT	13	13	153	63-216	65
	EB	7	7	141	124-174	35

Storm Lake Creek

Fish surveys were completed at five locations on Storm Lake Creek in early-to-mid August of 2010. The sites were located at RM 0.6, 1.4, 3.0, 4.2, and 6.3. All of the sites were previously sampled in 2007 (Lindstrom et al. 2008). Table 28 and Appendix A contain summaries of data collected on Storm Lake Creek in 2010. Fish density tended to be low at all of the sites and appeared to be slightly less than what was observed in 2007. Westslope cutthroat trout were present in all of the sample sections as were brook trout. Cutthroat trout tended to be the most common species at all of the sites with brook trout and bull trout usually occurring in lower numbers if present. Bull trout were most common in the upper reaches of the stream, but densities were very low.

At RM 0.6, the estimate for westslope cutthroat trout (> 75 mm) was 6 per 100 m (95% confidence interval: 6-6), which was the same for brook trout (95% confidence interval: 6-7). At RM 1.4, the estimate for westslope cutthroat trout (> 75 mm) was 9 per 100 m (95% confidence interval: 9-9), and for brook trout (> 75 mm) it was 4 per 100 m (95% confidence interval: 4-5). Only one bull trout was captured at this location. At RM 3.0, the estimate for westslope cutthroat trout (> 75 mm) was 8 per 100 m (95% confidence interval: 8-9), and for brook trout (> 75 mm) it was 5 per 100 m (95% confidence interval: 5-5). Additionally, one phenotypic westslope cutthroat trout – rainbow trout hybrid was observed in the section. At RM 4.2, the estimate for westslope cutthroat trout (> 75 mm) was 9 per 100 m (95% confidence interval: 9-10), but only one brook trout was captured in the reach. The estimate for bull trout (> 75 mm) at RM 4.3 was 3 per 100 m (95% confidence interval: 3-4). At RM 6.3, the estimate for westslope cutthroat trout

(> 75 mm) was 19 per 100 m (95% confidence interval: 8-9). In addition, a single rainbow trout was also collected in the section. This was a new finding as rainbow trout had not been observed in Storm Lake Creek during 2007 sampling. The estimate for bull trout (> 75 mm) at RM 6.3 was 4 per 100 m (95% confidence interval: 4-4). No estimate was made for brook trout as only two individuals were captured in the reach. Westslope cutthroat trout density at RM 6.3 was noticeably higher than any of the other sections, and several of the fish were relatively large (Table 28; Appendix A). It seemed likely that some of these fish were out-migrant's from Storm Lake located not far above the section location.

Table 28. Electrofishing data collected at five sections on Storm Lake Creek in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.6	WCT	16	16	102	63-189	76
	EB	5	5	127	86-195	24
RM 1.4	WCT	11	11	151	64-195	61
	EB	6	6	84	46-166	33
	BULL	1	1	201	n/a	6
RM 3.0	WCT	10	10	133	62-217	63
	WCTxRB	1	1	195	n/a	6
	EB	5	5	138	86-164	31
RM 4.2	WCT	12	12	147	62-221	80
	EB	1	1	155	n/a	7
	BULL	2	2	130	88-172	13
RM 6.3	WCT	22	22	160	58-363	76
	EB	2	2	126	119-133	7
	BULL	4	4	132	87-158	14
	RB	1	1	281	n/a	3

Mill Creek Drainage

Cabbage Gulch

Fish surveys were completed at three locations on Cabbage Gulch in early August of 2010. Given limited habitat and very low flow, only the best habitat available was sampled. Sample reaches were not measured precisely in the field since each reach was not sampled in its entirety. Total reach lengths were later approximated using a GIS but the values were not used to determine CPUE. The total reach length at RM 0.7 was approximately 350 meters, while at RM 1.5 and 1.9 the sampled stream length was roughly 200 and 250 meters, respectively. At all sample locations, westslope cutthroat trout were the only species observed. Table 29 and Appendix A contain summaries of data collected on Cabbage Gulch in 2010. Fish density was low at all sites, but fish were most common in the upper half of the small drainage. The presence of a couple different age classes including young juveniles suggests that the fish are capable of spawning in Cabbage Gulch despite marginal habitat conditions observed at the time of the survey.

Table 29. Electrofishing data collected at three sites on Cabbage Gulch in 2010.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.7	WCT	4	n/a	139	124-166	100
RM 1.5	WCT	13	n/a	103	76-161	100
RM 1.9	WCT	6	n/a	85	69-136	100

Joyner Gulch

A single, discontinuous fish survey was completed throughout lower Joyner Gulch in early August of 2010. The sample reach was located upstream of the Mill Creek Highway crossing, and was approximately 1.3 km in length. Beaver activity was very common throughout the sampled reach and a number of large dams and ponds were observed. Throughout much of the sampled reach, both westslope cutthroat trout and brook trout were present, with brook trout appearing to be the more common species. However at the upper extent of the sample reach, only cutthroat trout were observed. The exact location of where the composition change took place was not determined, but it is likely that a physical barrier is present and needs to be further evaluated. Table 30 and Appendix A contain summaries of data collected on Joyner Gulch in 2010.

Table 30. Electrofishing data collected on Joyner Gulch in 2010.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
Upstream of Highway	WCT	41	n/a	101	50-132	n/a
	EB	60	n/a	98	60-221	n/a

German Gulch Drainage

German Gulch

Fish surveys were completed at five locations on German Gulch in mid July of 2012. The sites were located at RM 0.2, 3.0, 3.9, 6.0, and 6.7. The sites at RM 0.2, 3.0, and 6.0 were previously established and sampled in 2008 (Liermann et al. 2009). The remaining two sites were unique. The site at RM 3.9 was within a segment of the channel completely reconstructed in 2007 as part of a pilot restoration project, while the site at RM 6.7 was located above a small dam that the U.S. Forest Service was proposing to remove relative to management activities associated with the old Beal Mountain Mine site located not far upstream. Table 31 and Appendix A contain summaries of data collected on German Gulch in 2012.

At RM 0.2, only a single electrofishing pass was made through the sample section. Although no population estimate was generated, fish density was found to be very high and many of the fish were larger adults. It appeared likely that fish were crowding into available habitat in lower German Gulch to seek refuge from marginal water quality in nearby Silver Bow Creek. It is likely that the presence of several large beaver dams situated immediately upstream of the sample section were contributing to the observed densities, as fish probably found negotiating these large dams difficult during low flow conditions. Westslope cutthroat trout and brook trout were the only trout species observed in the reach, with brook trout tending to be slightly more common. At RM 3.0, fish density continued to be rather high, with westslope cutthroat trout dominating the fish community. While brook trout remained present, the species was far less common than observed closer to the mouth of the stream. Average fish size at RM 3.0 was more appropriate for the size of the stream. The estimate for westslope cutthroat trout (> 75 mm) was 84 per 100 m (95% confidence interval: 81-89), and for brook trout (> 75 mm) it was 18 per 100 m (95% confidence interval: 18-20). A little farther upstream within the reconstructed reach at RM 3.9, westslope cutthroat trout continued to comprise the bulk of the fish community. Brook trout were still present, but in even lesser densities than observed at RM 3.0. The estimate for westslope cutthroat trout (> 75 mm) was 51 per 100 m (95% confidence interval: 51-56), and for brook trout (> 75 mm) it was 8 per 100 m (95% confidence interval: 8-9). At RM 6.0 and 6.7, westslope cutthroat trout were the only species present. At RM 6.0 the estimate for westslope cutthroat trout (> 75 mm) was

fairly low at 11 per 100 m (95% confidence interval: 11-12). The stream was very small in this part of the drainage, and habitat was somewhat limited because of it. Only a single electrofishing pass was made above the small dam at RM 6.7, so no estimate was generated.

Table 31. Electrofishing data collected at five sections on German Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.2	WCT	86	86	277	73-432	43
	EB	115	115	313	57-483	57
RM 3.0	WCT	75	75	111	36-240	82
	EB	16	16	101	52-179	18
RM 3.9	WCT	98	39	133	43-278	88
	EB	13	5	152	92-210	12
RM 6.0	WCT	10	10	138	86-221	100
RM 6.7	WCT	14	14	157	97-236	100

Beefstraight Creek

Fish surveys were completed at two locations on Beefstraight Creek in mid July of 2012. The sites were located at RM 1.3 and 4.5. Both sites were previously sampled in 2008 (Liermann et al. 2009). Table 32 and Appendix A contain summaries of data collected on Beefstraight Creek in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at both sites, with cutthroat trout being noticeably more common. This pattern was also observed in 2008. At RM 1.3, the estimate for westslope cutthroat trout (> 75 mm) was 74 per 100 m (95% confidence interval: 71-80), and for brook trout (> 75 mm) it was 16 per 100 m (95% confidence interval: 11-37). At RM 4.5, the estimate for westslope cutthroat trout (> 75 mm) was 35 per 100 m (95% confidence interval: 35-35), and for brook trout (> 75 mm) it was 12 per 100 m (95% confidence interval: 12-13). When first pass data from 2012 was compared to that from 2008, there was relatively little difference in species composition and density suggesting little change in the fishery between the two sample periods.

Table 32. Electrofishing data collected at two sections on Beefstraight Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.3	WCT	61	61	147	25-254	91
	EB	6	6	163	84-219	9
RM 4.5	WCT	33	33	134	79-187	80
	EB	8	8	135	84-212	20

Browns Gulch Drainage

Browns Gulch

Fish surveys were completed at four locations on Browns Gulch in late July of 2012. The sites were located at RM 11.6, 13.9, 15.4, and 16.5. All sites were previously sampled in 2009 (Lindstrom 2011). Table 33 and Appendix A contain summaries of data collected on Browns Gulch in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at all sites, with brook trout being noticeably more common. At RM 11.6, the estimate for westslope cutthroat trout (> 75 mm) was 10 per 100 m (95% confidence interval: 10-12), and for brook trout (> 75 mm) it was 165 per 100 m (95% confidence interval: 164-168). At RM 13.9, the estimate for westslope cutthroat trout (> 75 mm) was 7 per 100 m (95% confidence interval: 7-9), and for brook trout (> 75 mm) it was 81 per 100 m (95% confidence interval: 78-87). At RM 15.4, the estimate for westslope cutthroat trout (> 75 mm) was 14 per 100 m (95% confidence interval: 14-16), and for brook trout (> 75 mm) it was 179 per 100 m (95% confidence interval: 168-190). At RM 16.5, the estimate for westslope cutthroat trout (> 75 mm) was 4 per 100 m (95% confidence interval: 4-4), and for brook trout (> 75 mm) it was 56 per 100 m (95% confidence interval: 56-59). When first pass data from 2012 was compared to that from 2009, species composition was similar although overall fish density appeared to be up at all locations, especially for brook trout. This was likely because of good survival and recruitment relative to better than average flow conditions for the couple years prior.

Table 33. Electrofishing data collected at four sections on Browns Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 11.6	WCT	7	7	156	57-219	5
	EB	148	148	130	48-235	94
RM 13.9	WCT	6	6	116	67-170	8
	EB	69	69	107	34-166	92
RM 15.4	WCT	27	27	85	59-186	15
	EB	148	148	97	35-186	85
RM 16.5	WCT	2	4	88	60-115	4
	EB	49	98	74	28-161	96

Hail Columbia Gulch

Fish surveys were completed at two locations on Hail Columbia Gulch in early August of 2012. The sites were located at RM 4.0 and 5.4. Both sites were previously sampled in 2009 (Lindstrom 2011). Table 34 and Appendix A contain summaries of data collected on Hail Columbia Gulch in 2012. Brook trout comprised the entire trout community at both sites. This pattern was also observed in 2009. At RM 4.0, the estimate for brook trout (> 75 mm) was 82 per 100 m (95% confidence interval: 82-83). No estimate was generated at RM 5.4 as only one electrofishing pass was made through the section. When first pass data from 2012 was compared to that from 2009, fish density appeared to be up considerably. This was likely because of good survival and recruitment relative to better than average flow conditions for the couple years prior.

Table 34. Electrofishing data collected at two sections on Hail Columbia Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 4.0	EB	93	93	127	48-253	100
RM 5.4	EB	64	64	124	53-223	100

Flume Gulch

Fish surveys were completed at three locations on Flume Gulch in late July and early August of 2012. The sites were located at RM 0.3, 1.0, and 2.1. All sites were previously sampled in 2009 (Lindstrom 2011). Table 35 and Appendix A contain summaries of data collected on Flume Gulch in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at all sites, with brook trout being noticeably more common. At RM 0.3, no estimate was made as only one electrofishing pass was made through the section. At RM 1.0, the estimate for westslope cutthroat trout (> 75 mm) was 14 per 100 m (95% confidence interval: 14-15), and for brook trout (> 75 mm) it was 137 per 100 m (95% confidence interval: 126-149). At RM 2.1, the estimate for westslope cutthroat trout (> 75 mm) was 2 per 100 m (95% confidence interval: 2-2), and for brook trout (> 75 mm) it was 17 per 100 m (95% confidence interval: 15-24). When first pass data from 2012 was compared to that from 2009, the biggest difference was in brook trout density, which appeared to up in 2012 based on CPUE. This was especially so in the middle and lower portions of the drainage. Good survival and recruitment relative to better than average flow conditions for the couple years prior were likely reasons for the apparent increase in brook trout abundance in Flume Gulch.

Table 35. Electrofishing data collected at three sections on Flume Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.3	WCT	12	12	131	95-195	12
	EB	89	89	116	44-213	88
RM 1.0	WCT	12	12	131	100-196	10
	EB	105	105	115	48-226	90
RM 2.1	WCT	2	2	131	125-137	12.5
	EB	14	14	109	52-189	87.5

Alaska Gulch

Fish surveys were completed at three locations on Alaska Gulch in late July of 2012. The sites were located at RM 1.1, 2.5, and 3.6. The sites at RM 1.1 and 2.5 were previously sampled in 2009 (Lindstrom 2011), whereas the site at RM 3.6 was a new location situated downstream of a culvert determined to be a likely upstream passage barrier during the 2009 survey. Table 36 and Appendix A contain summaries of data collected on Alaska Gulch in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at all sites, with brook trout tending to be more common. At RM 1.1, the estimate for westslope cutthroat trout (> 75 mm) was 11 per 100 m (95% confidence interval: 11-12), and for brook trout (> 75 mm) it was 58 per 100 m (95% confidence interval: 58-59). At RM 2.5, no estimate was made for westslope cutthroat trout as all

individuals captured were less than 75 mm in length. For brook trout (> 75 mm) an estimate was made and it was 4 per 100 m (95% confidence interval: 4-4). At RM 3.6 the estimate for westslope cutthroat trout (> 75 mm) was 1 per 100 m (95% confidence interval: 1-1), and for brook trout (> 75 mm) it was 18 per 100 m (95% confidence interval: 18-20). When first pass data from 2012 was compared to that from 2009, the biggest difference was in brook trout density at the lowest sample location, which was up in 2012 based on CPUE. Good survival and recruitment relative to better than average flow conditions for the couple years prior were likely reasons for the apparent increase in brook trout abundance in this portion of Alaska Gulch. Habitat is more limited in the middle and upper portions of the drainage and less change was noted in these areas.

Table 36. Electrofishing data collected at three sections on Alaska Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 1.1	WCT	11	11	114	68-165	13
	EB	76	76	99	33-187	87
RM 2.5	WCT	8	8	62	50-67	57
	EB	6	6	90	42-127	43
RM 3.6	WCT	3	3	91	57-153	17
	EB	15	15	116	87-161	83

American Gulch

Fish surveys were completed at three locations on American Gulch in early August of 2012. The sites were located at RM 0.4, 1.2, and 2.4. All sites were previously sampled in 2009 (Lindstrom 2011). Table 37 and Appendix A contain summaries of data collected on American Gulch in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at all sites, with brook trout being more common. At RM 0.4, the estimate for westslope cutthroat trout (> 75 mm) was 4 per 100 m (95% confidence interval: 4-4), and for brook trout (> 75 mm) it was 60 per 100 m (95% confidence interval: 58-64). At RM 1.2, the estimate for westslope cutthroat trout (> 75 mm) was 3 per 100 m (95% confidence interval: 3-4), and for brook trout (> 75 mm) it was 73 per 100 m (95% confidence interval: 39-150). Capture efficiency at this site was relatively poor, and this may have affected estimate accuracy, especially for brook trout. This should be considered if utilizing this data. No estimate was made at RM 2.4 as only one electrofishing pass was made through the section. When first pass data from 2012 was compared to that from 2009, the most notable differences were that brook trout appeared to be slightly more abundant in the lower portion of the drainage, as well as showing signs of possible range expansion into the upper reaches of the stream, an area where the species was not observed in 2009. Good survival and recruitment relative to better than

average flow conditions for the couple years prior were likely reasons for the apparent increase in brook trout abundance and range in American Gulch in 2012.

Table 37. Electrofishing data collected at three sections on American Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 0.4	WCT	4	4	98	95-101	7
	EB	52	52	96	37-186	93
RM 1.2	WCT	2	2	112	92-132	10
	EB	18	18	97	40-154	90
RM 2.4	WCT	2	2	83	80-86	33
	EB	4	4	128	110-150	67

Basin Creek Drainage

Basin Creek

Fish surveys were completed at two locations on upper Basin Creek in late September of 2010 and 2012. The sites were located at RM 14.0 and 14.5, and were situated near the headwaters of the drainage. Sampling at these sites was conducted to monitor the success of a westslope cutthroat trout restoration project that occurred between 2005 and 2007, which consisted of the movement of genetically pure fish from downstream of a natural barrier into unoccupied habitat located above it. The goal of the project was to expand the range of the species in upper Basin Creek thereby increasing the chance of long-term persistence. Sampling at both locations in both years documented that transplanted fish were persisting as well as successfully reproducing, although fish density tended to be fairly low overall. As expected, westslope cutthroat trout were the only fish observed at the sample locations. Table 38 and 39 as well as Appendix A contain summaries of data collected on upper Basin Creek in 2010 and 2012, respectively. At RM 14.0, the 2010 estimate for fish > 75 mm in length was 10 per 100 m (95% confidence interval: 10-11). The 2012 estimate at the same location for the same size class was very similar at 9 per 100 m (95% confidence interval: 9-11). At RM 14.5, the 2010 estimate for fish > 75 mm in length was 23 per 100 m (95% confidence interval: 23-24). The 2012 estimate at the same location for the same size class was also very similar at 24 per 100 m (95% confidence interval: 24-26).

Table 38. Electrofishing data collected at three sections on American Gulch in 2010. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 14.0	WCT	9	9	116	90-175	100
RM 14.5	WCT	20	20	96	83-138	100

Table 39. Electrofishing data collected at three sections on American Gulch in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 14.0	WCT	5	5	164	98-216	100
RM 14.5	WCT	16	16	105	82-184	100

Blacktail Creek Drainage

Blacktail Creek

Fish surveys were completed at four locations on Blacktail Creek in mid-August of 2012. The sites were located at RM 7.0, 8.2, 9.6, and 13.0. The sites at RM 8.2, 9.6, and 13.0 were previously sampled in 2008 (Liermann et al. 2009), whereas the site at RM 7.0 was a new location. Table 40 and Appendix A contain summaries of data collected on Blacktail Creek in 2012. Westslope cutthroat trout and brook trout comprised the entire trout community at all sites, with brook trout being more common at the lower sites but westslope cutthroat trout becoming a larger component of the species composition in the upper most sites. At RM 7.0, the estimate for westslope cutthroat trout (> 75 mm) was 30 per 100 m (95% confidence interval: 29-34), and for brook trout (> 75 mm) it was 56 per 100 m (95% confidence interval: 55-59). At RM 8.2, the estimate for westslope cutthroat trout (> 75 mm) was 56 per 100 m (95% confidence interval: 54-60), and for brook trout (> 75 mm) it was 40 per 100 m (95% confidence interval: 40-42). At both of these sites, the single pass data displayed in table 40 indicated that brook trout represented over 70% of the fish in the reach, however many of these fish were young-of-the-year, which often can be quite abundant when present (Appendix A). At RM 9.6, the estimate for westslope cutthroat trout (> 75 mm) was 86 per 100 m (95% confidence interval: 82-93), and for brook trout (> 75 mm) it was 56 per 100 m (95% confidence interval: 56-57). At RM 13.0, the estimate for westslope cutthroat trout (> 75 mm) was 24 per 100 m (95% confidence interval: 24-26), and for brook trout (> 75 mm) it was 2 per 100 m (95% confidence interval: 2-2). When first pass data from 2012 was compared to that from

2008, species composition appeared similar, but overall fish density appeared to be up at all previously sampled locations. Many of the fish contributing to the higher observed numbers for both species were small fish approximately one year of age or younger. The increased density of these age classes was likely because of good survival and recruitment relative to better than average flow conditions for the one to two years prior.

Table 40. Electrofishing data collected at four sections on Blacktail Creek in 2012. Data presented is from the first electrofishing pass.

Section Name	Species	Number of Fish Captured	Fish per 100 m (CPUE)	Mean Length (mm)	Length Range (mm)	Species Composition (%)
RM 7.0	WCT	20	20	96	24-237	17
	EB	99	99	75	44-190	83
RM 8.2	WCT	38	38	129	69-285	29
	EB	91	91	83	45-202	71
RM 9.6	WCT	79	79	103	31-223	52
	EB	72	72	100	26-175	48
RM 13.0	WCT	73	73	67	24-132	99
	EB	1	1	141	n/a	1

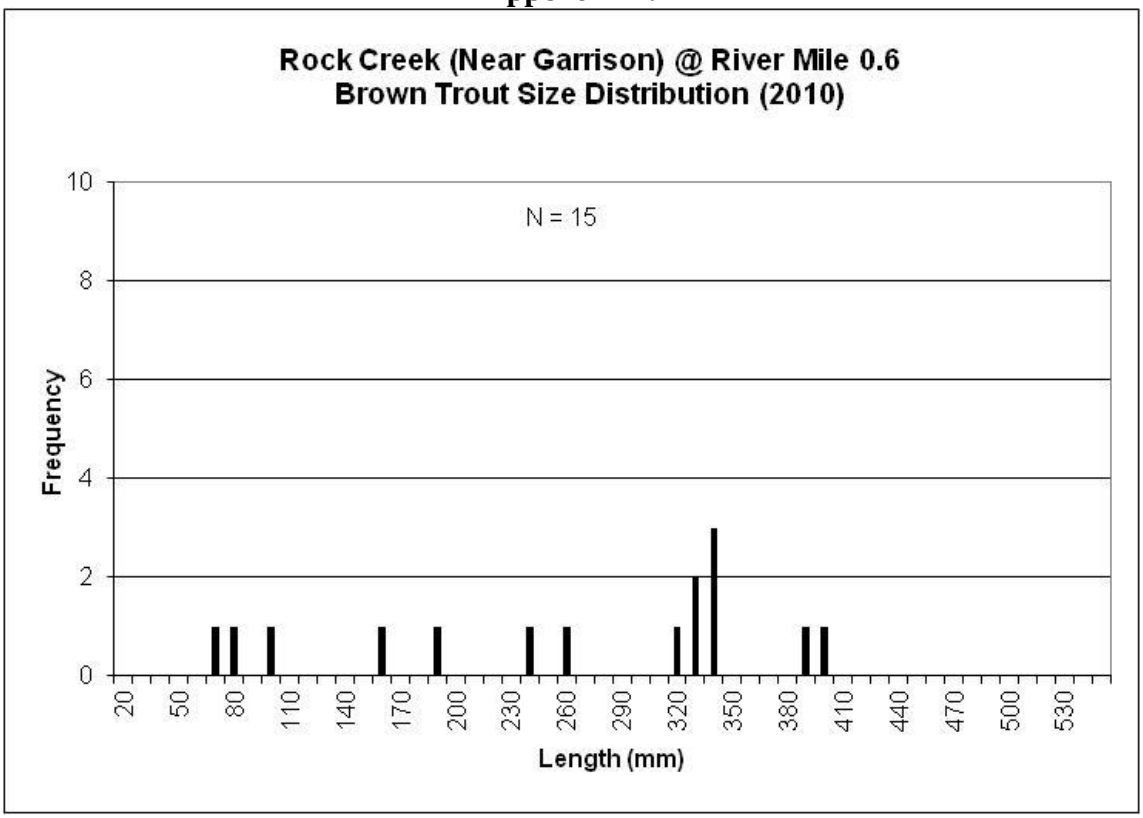
LITERTURE CITED

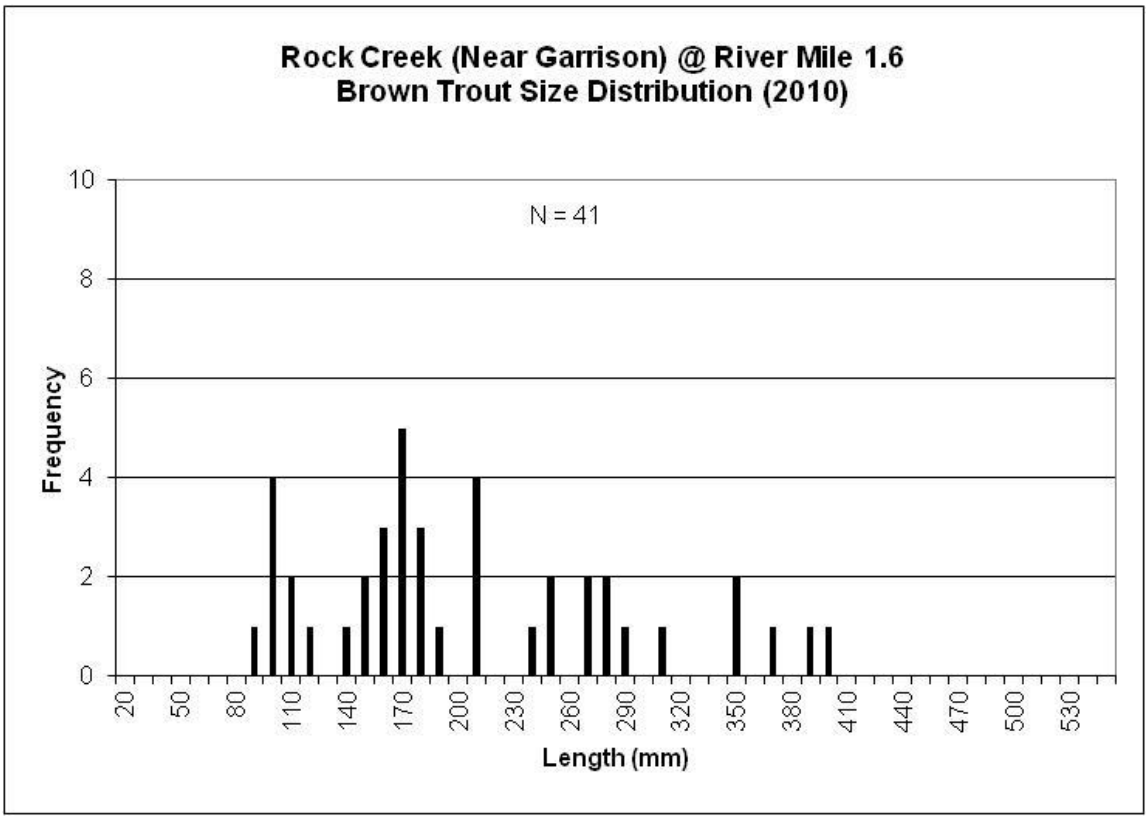
Liermann, B., J. Lindstrom and R. Kreiner. 2009. An assessment of fish populations and riparian habitat in tributaries of the Upper Clark Fork River Basin: Phase II. Montana Fish, Wildlife & Parks Report.

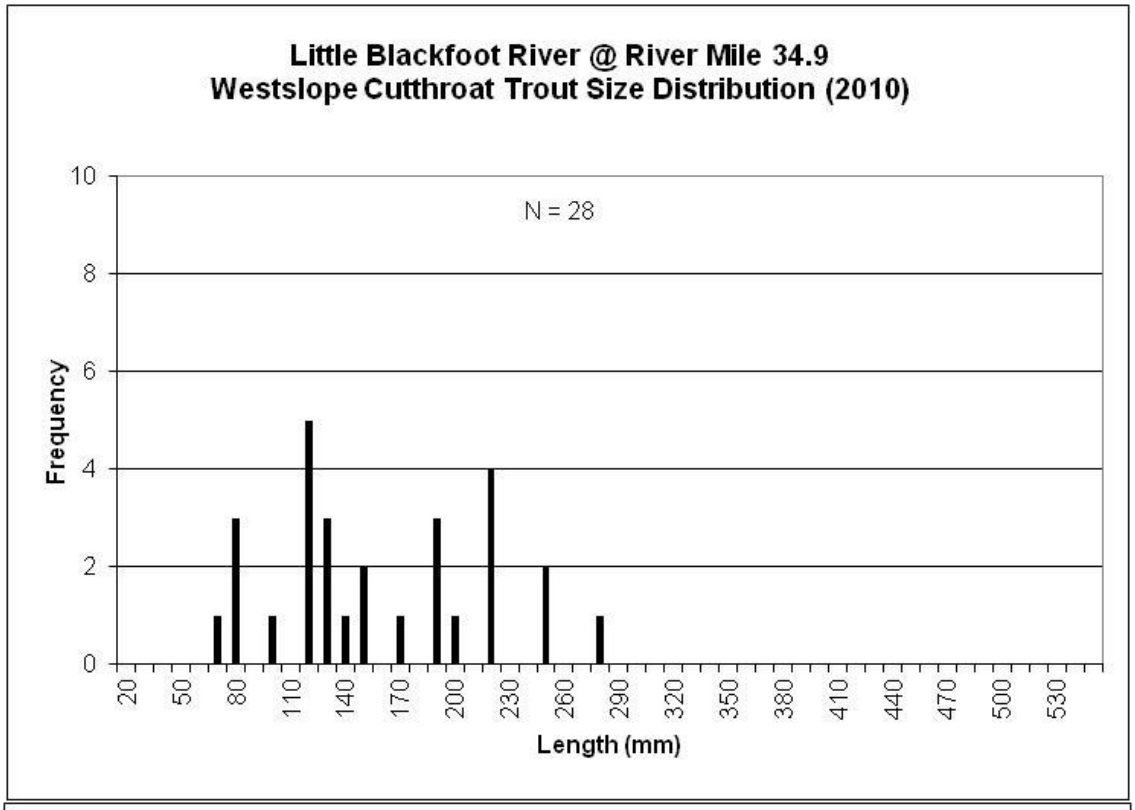
Lindstrom, J., B. Liermann, and R. Kreiner. 2008. An assessment of fish populations and riparian habitat in tributaries of the Upper Clark Fork River Basin. Montana Fish, Wildlife & Parks Report.

Lindstrom, J. 2011. An assessment of fish populations and riparian habitat in tributaries of the Upper Clark Fork River Basin: 2009 Report. Montana Fish, Wildlife & Parks Report.

Appendix A.


Rock Creek (Near Garrison) @ River Mile 0.6
Brown Trout Size Distribution (2010)
N = 15
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Rock Creek (Near Garrison) @ River Mile 1.6
Brown Trout Size Distribution (2010)
N = 41
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 34.9
Westslope Cutthroat Trout Size Distribution (2010)
N = 28
Frequency
0
2
4
6
8
10
20
50
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110
140
170
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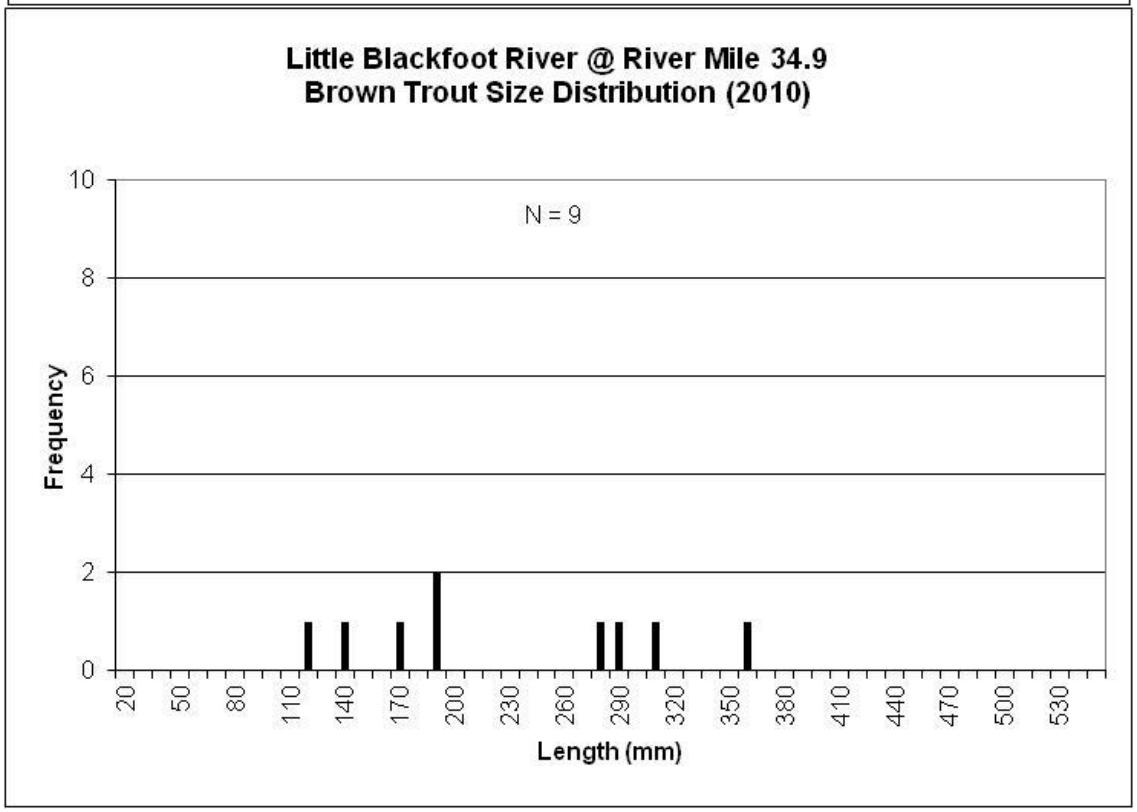
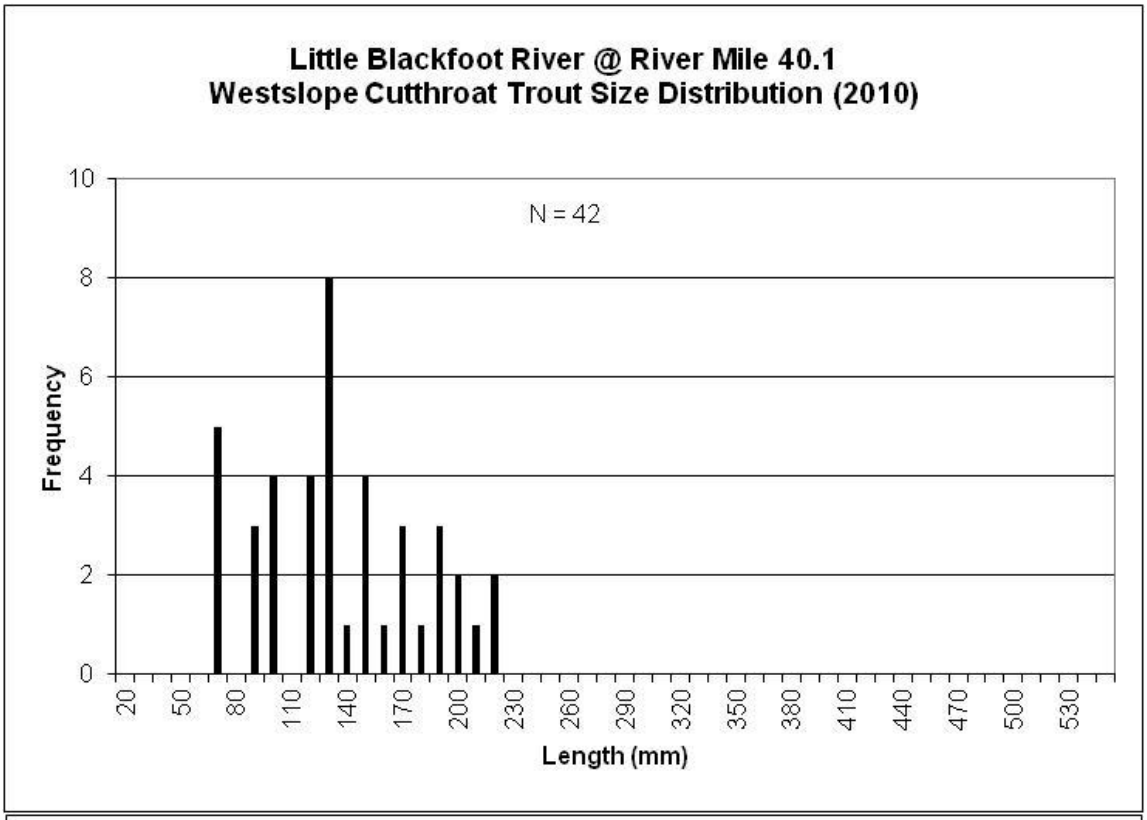
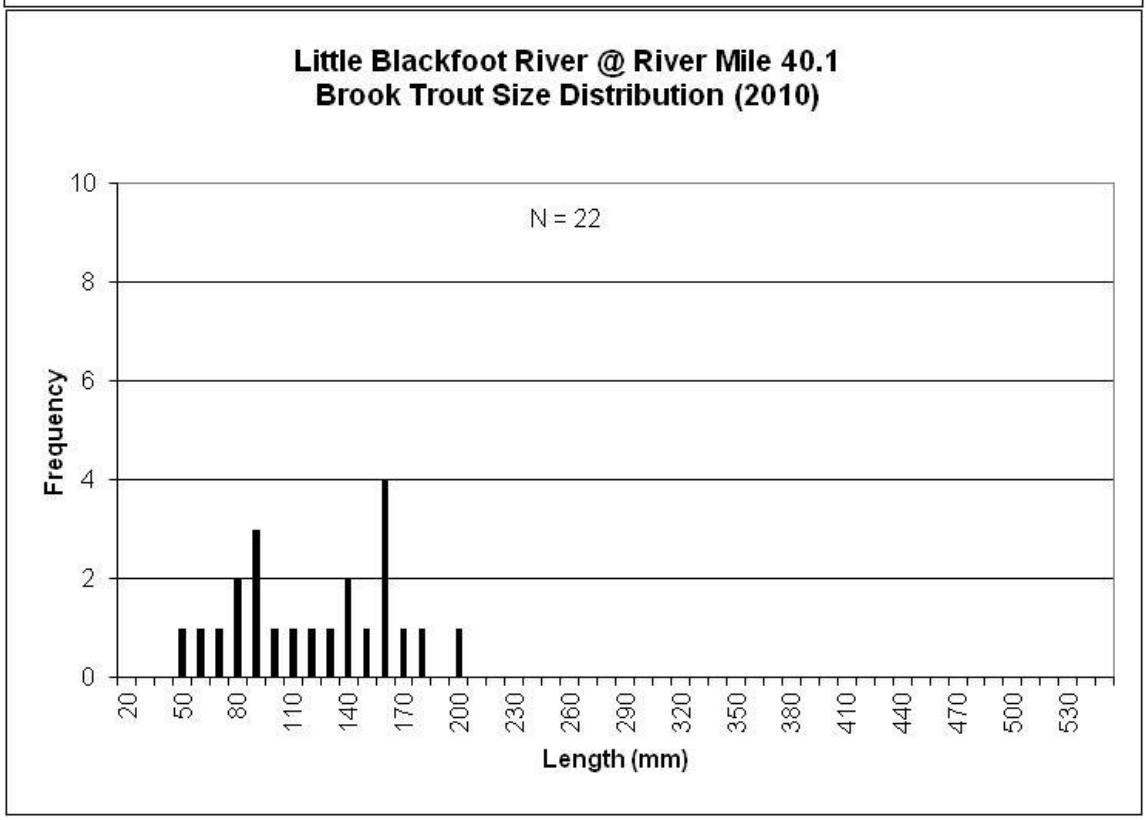
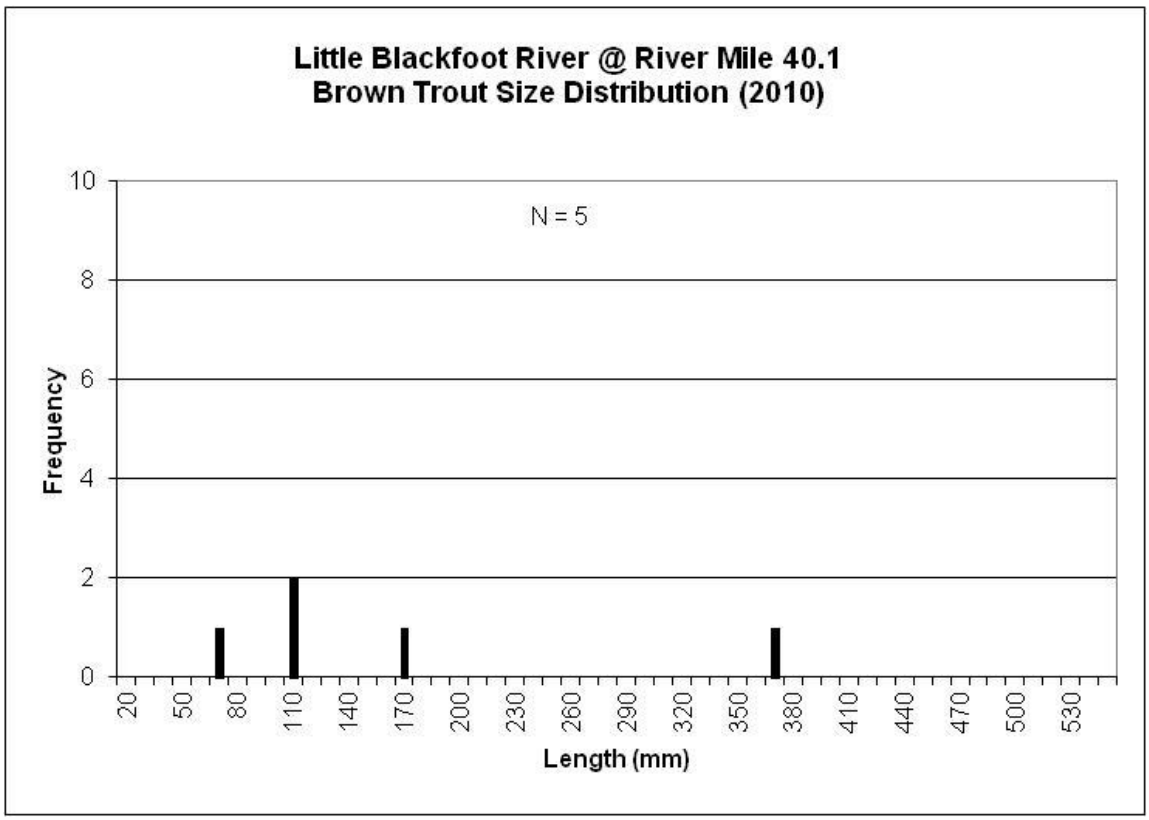
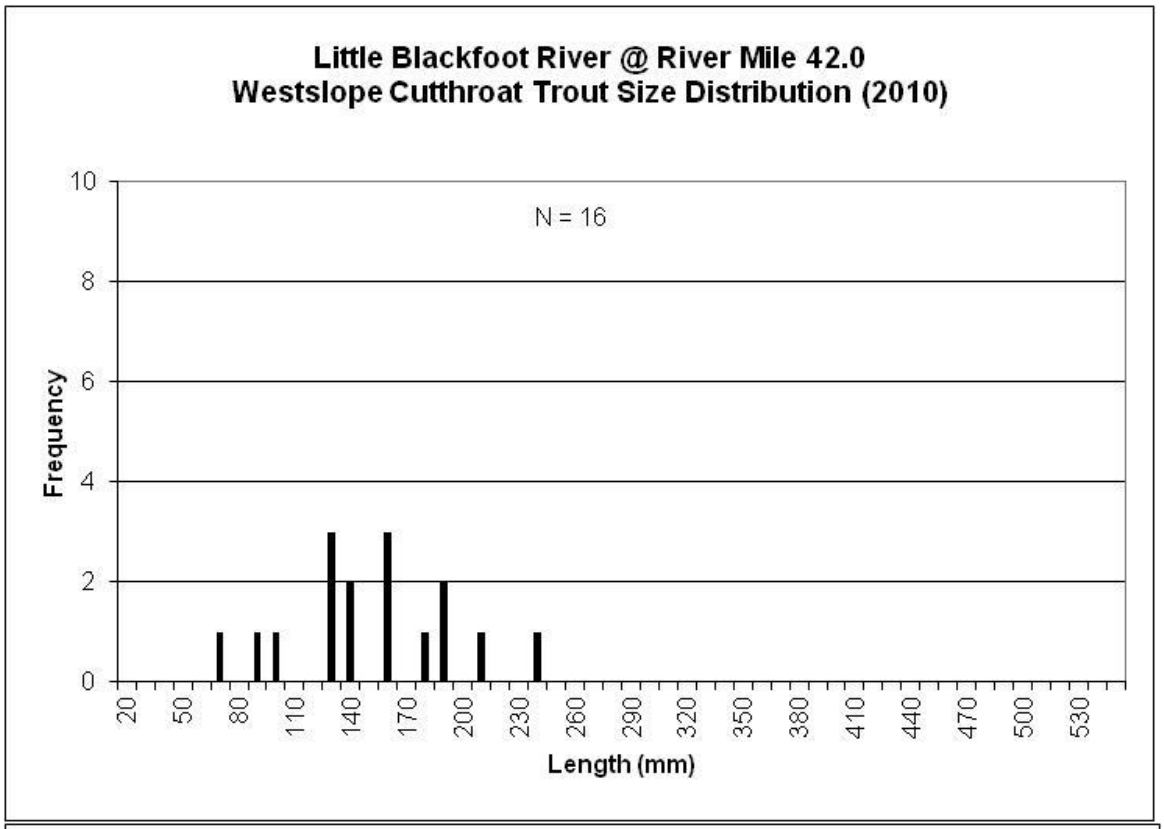
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

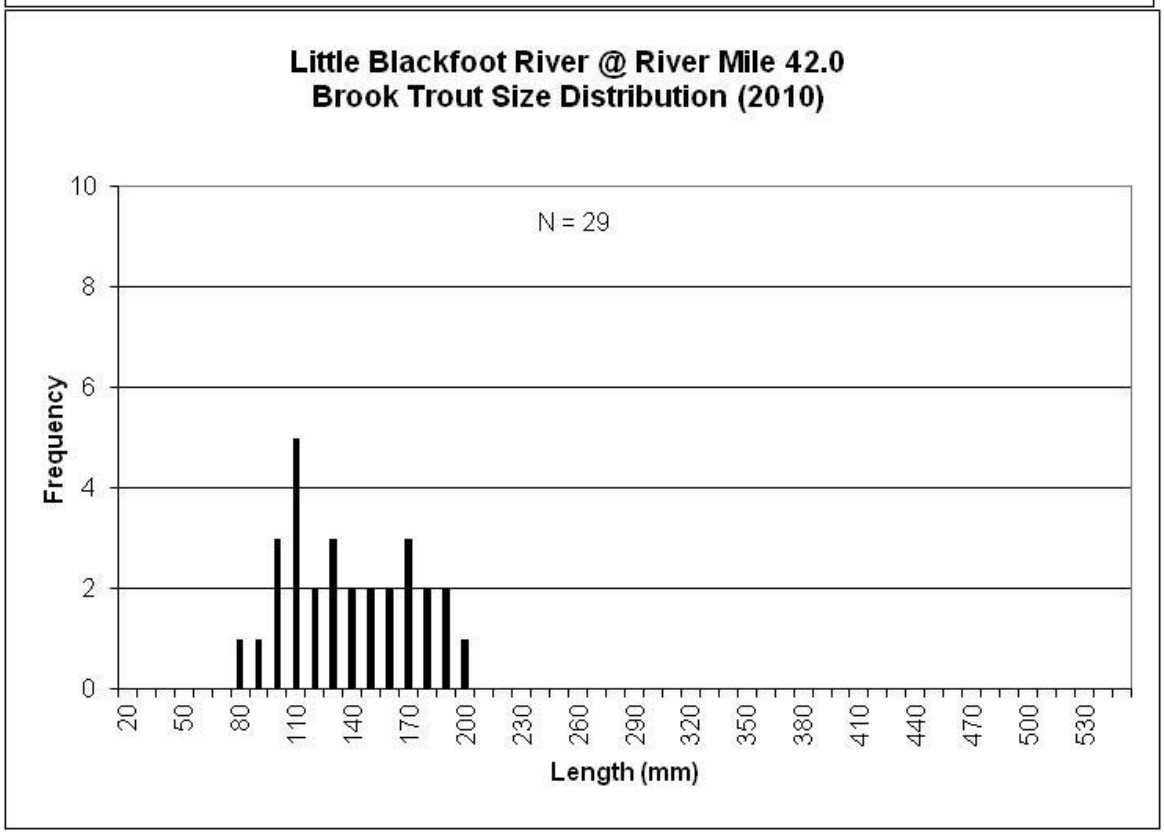

Little Blackfoot River @ River Mile 34.9
Brown Trout Size Distribution (2010)
N = 9
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

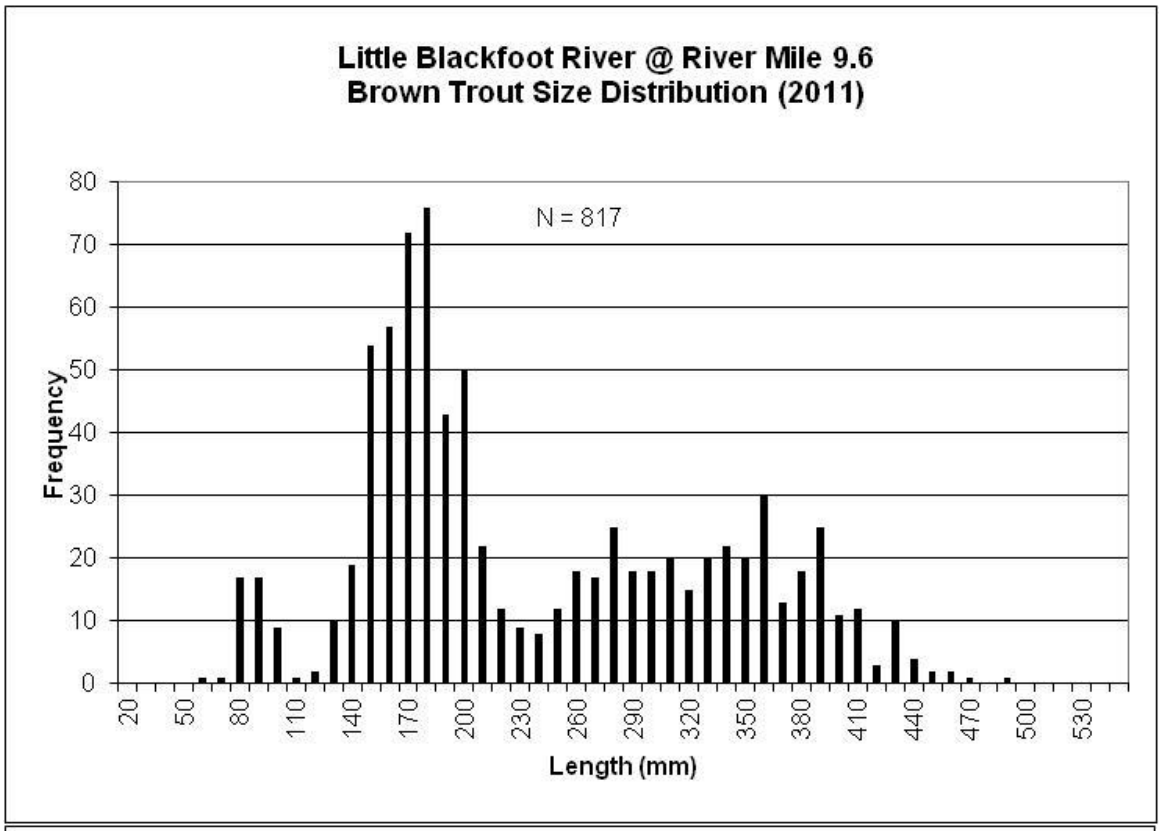

Little Blackfoot River @ River Mile 40.1
Westslope Cutthroat Trout Size Distribution (2010)
N = 42
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

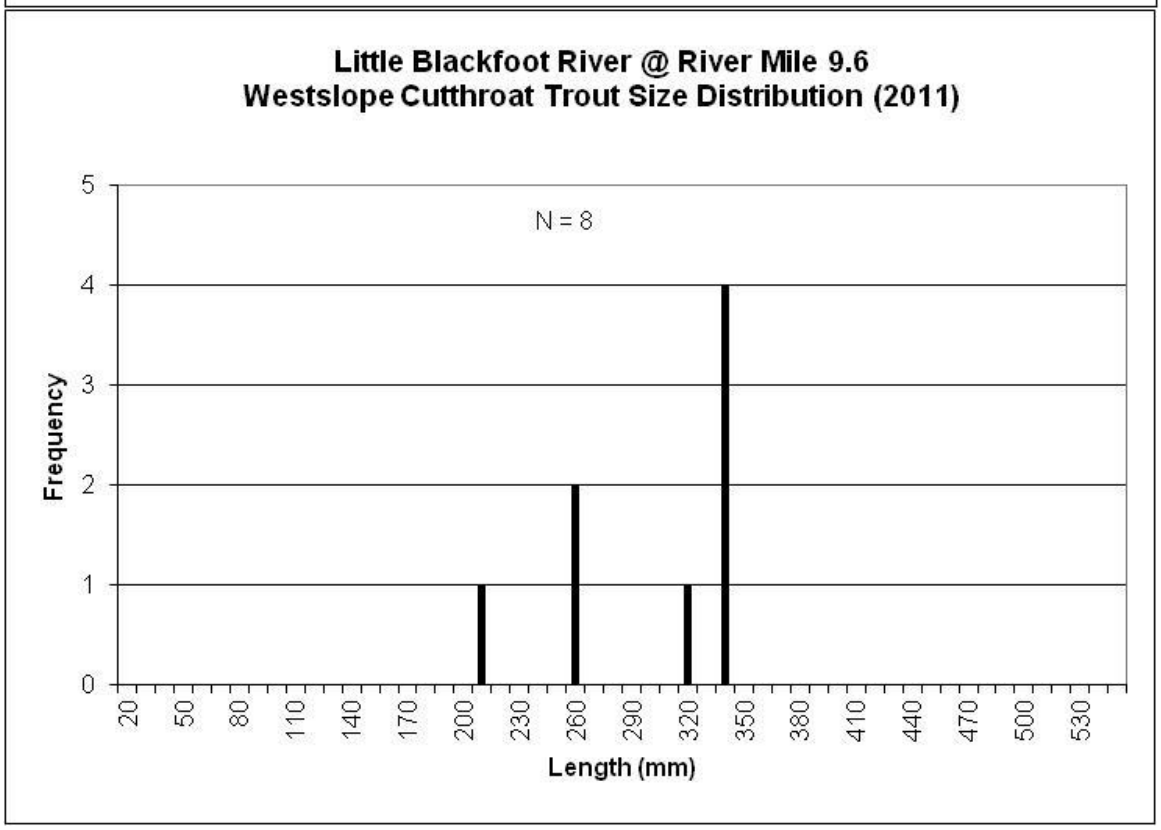

Little Blackfoot River @ River Mile 40.1
Brook Trout Size Distribution (2010)
N = 22
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Little Blackfoot River @ River Mile 40.1
Brown Trout Size Distribution (2010)
N = 5
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 42.0
Westslope Cutthroat Trout Size Distribution (2010)
N = 16
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 42.0
Brook Trout Size Distribution (2010)
N = 29
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 9.6
Brown Trout Size Distribution (2011)
N = 817
Frequency
Length (mm)
0
10
20
30
40
50
60
70
80
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Little Blackfoot River @ River Mile 9.6
Westslope Cutthroat Trout Size Distribution (2011)
N = 8
Frequency
Length (mm)
0
1
2
3
4
5
20
50
80
110
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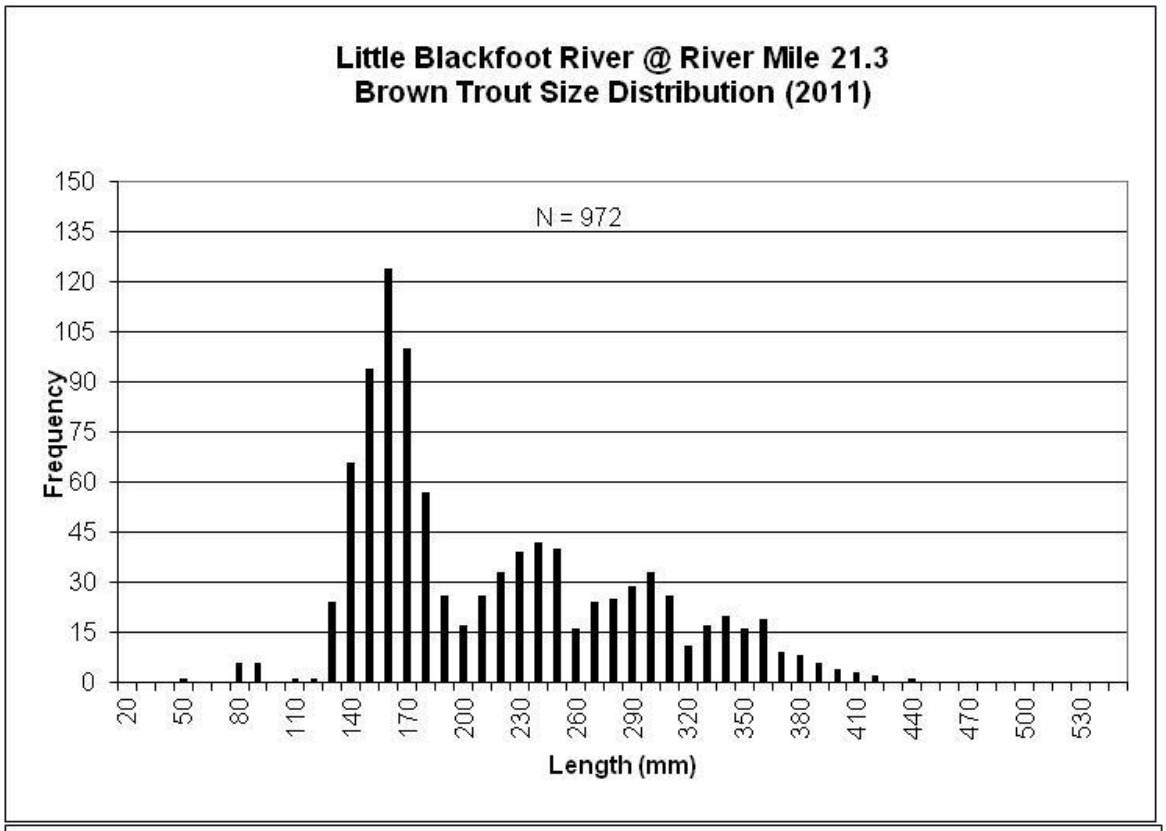
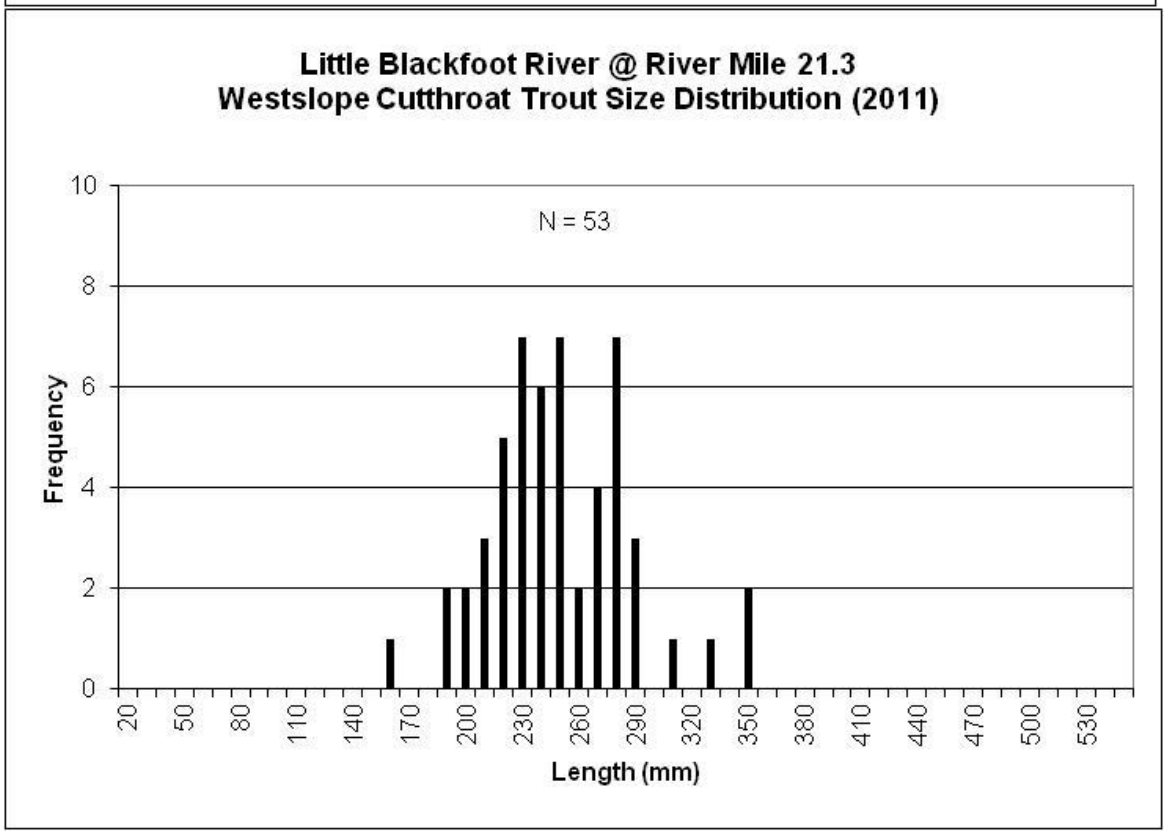
170
200
230
260
290
320
350
380
410
440
470
500
530


Little Blackfoot River @ River Mile 21.3
Brown Trout Size Distribution (2011)
N = 972
Frequency
0
15
30
45
60
75
90
105
120
135
150
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 21.3
Westslope Cutthroat Trout Size Distribution (2011)
N = 53
Frequency
0
2
4
6
8
10
20
50
80
110
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170
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230
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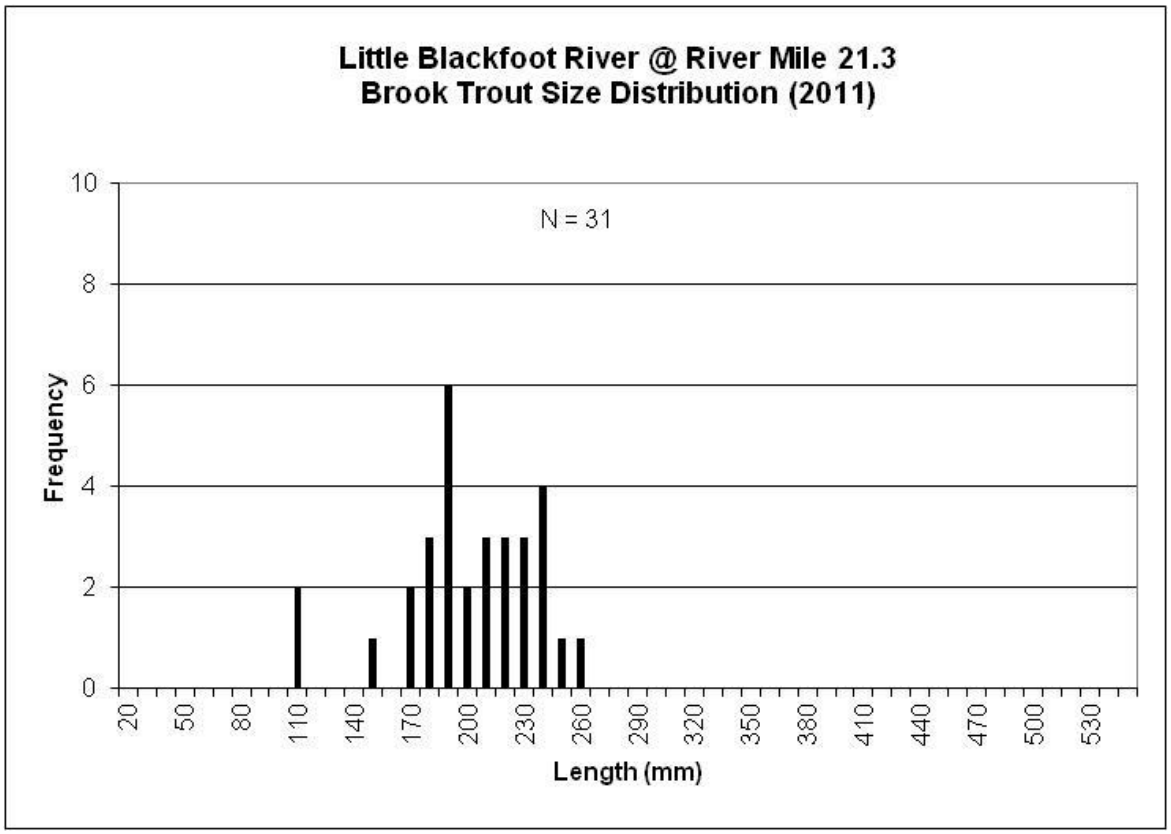
290
320
350
380
410
440
470
500
530
Length (mm)


Little Blackfoot River @ River Mile 21.3
Brook Trout Size Distribution (2011)
N = 31
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
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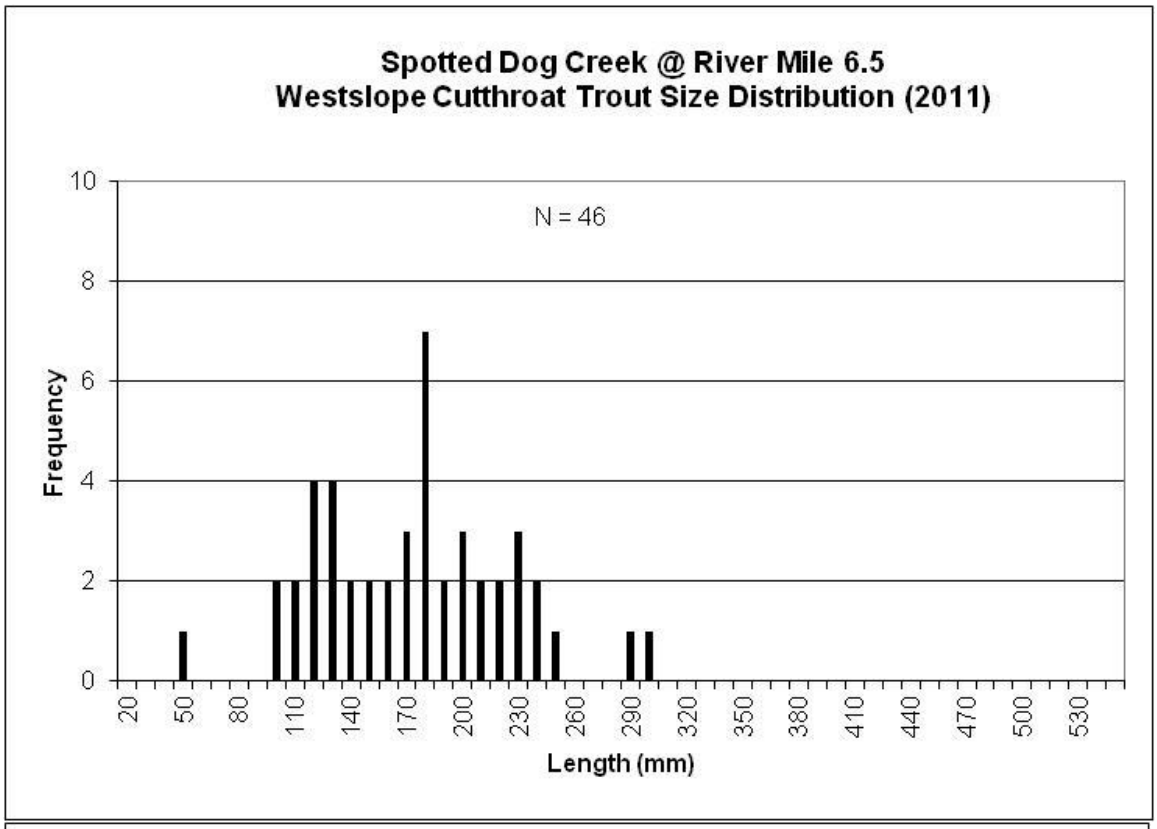
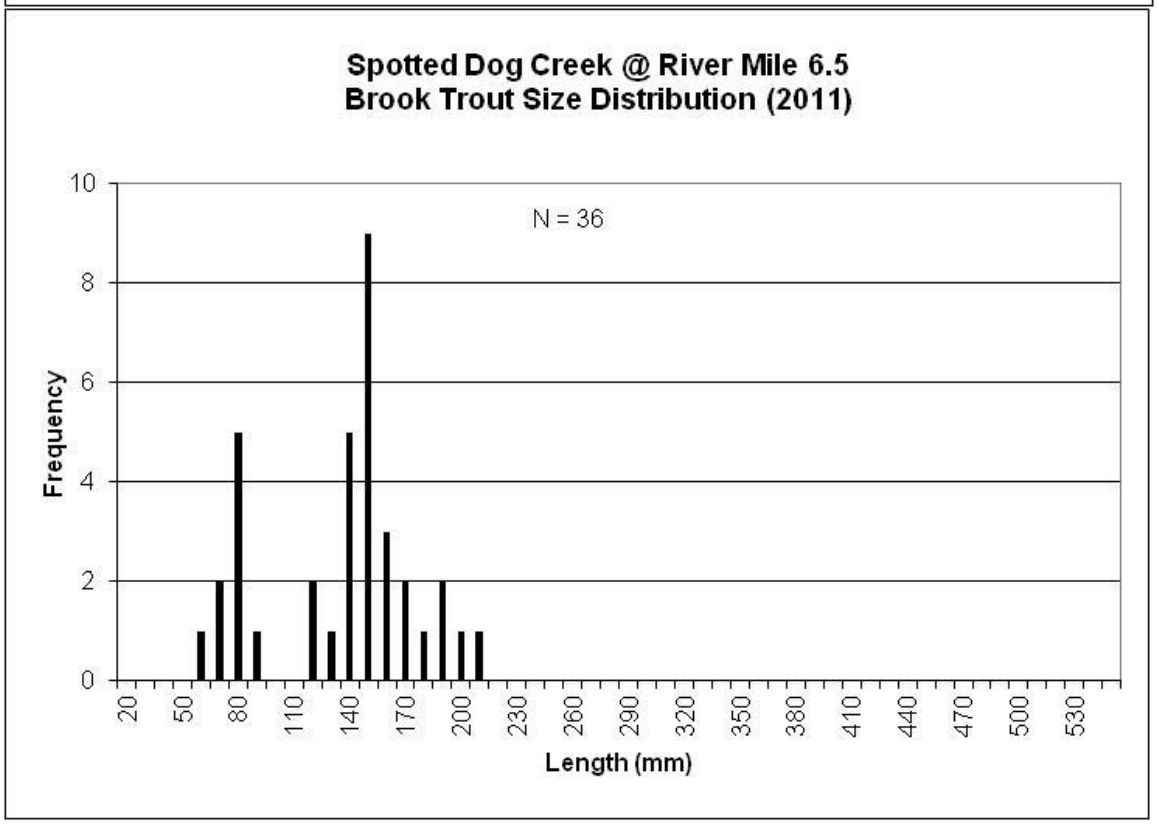
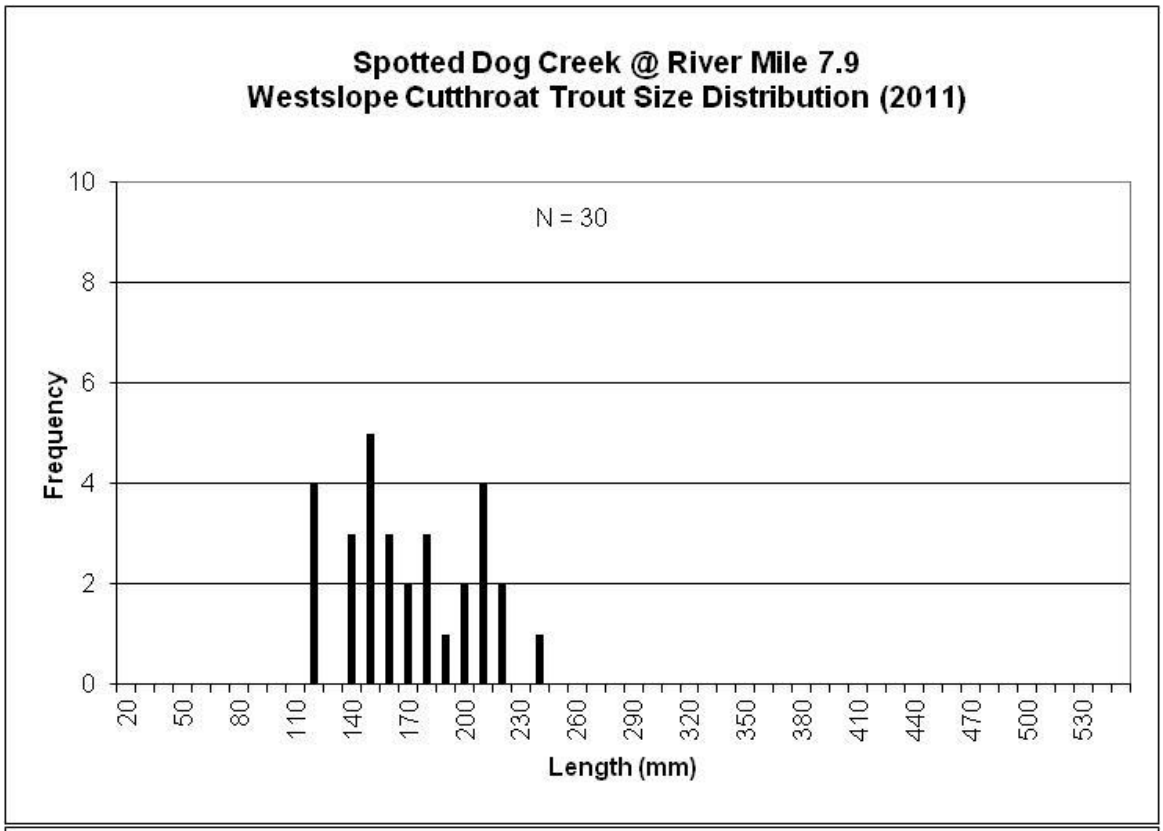
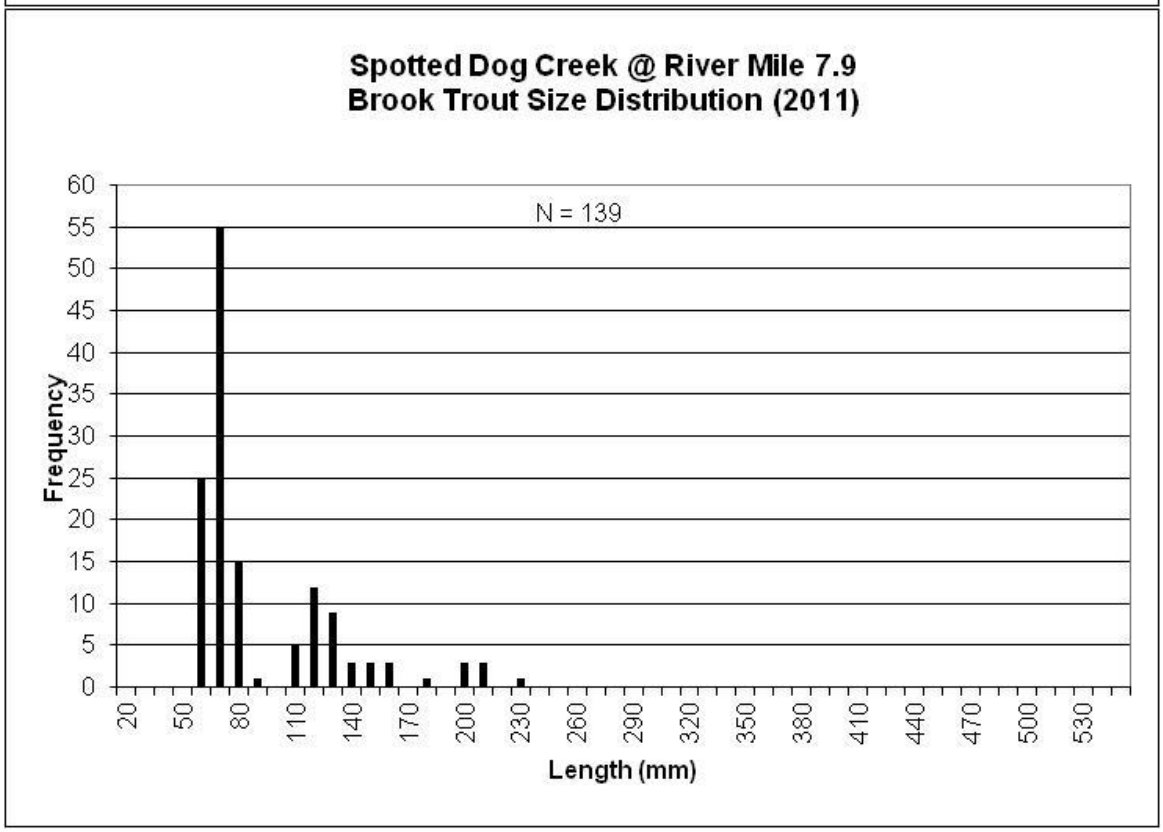
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Spotted Dog Creek @ River Mile 6.5
Westslope Cutthroat Trout Size Distribution (2011)
N = 46
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Spotted Dog Creek @ River Mile 6.5
Brook Trout Size Distribution (2011)
N = 36
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Spotted Dog Creek @ River Mile 7.9
Westslope Cutthroat Trout Size Distribution (2011)
N = 30
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Spotted Dog Creek @ River Mile 7.9
Brook Trout Size Distribution (2011)
N = 139
Frequency
0
5
10
15
20
25
30
35
40
45
50
55
60
20
50
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110
140
170
200
230
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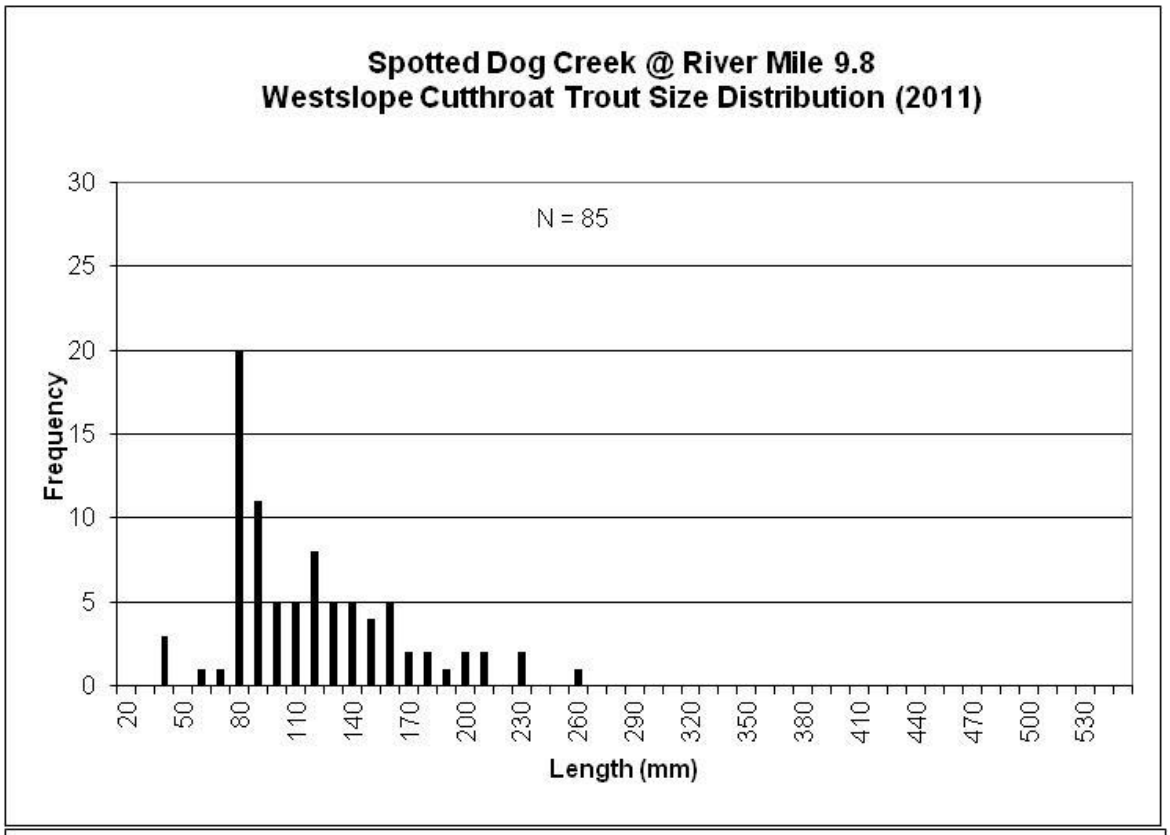
290
320
350
380
410
440
470
500
530
Length (mm)


Spotted Dog Creek @ River Mile 9.8
Westslope Cutthroat Trout Size Distribution (2011)
N = 85
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
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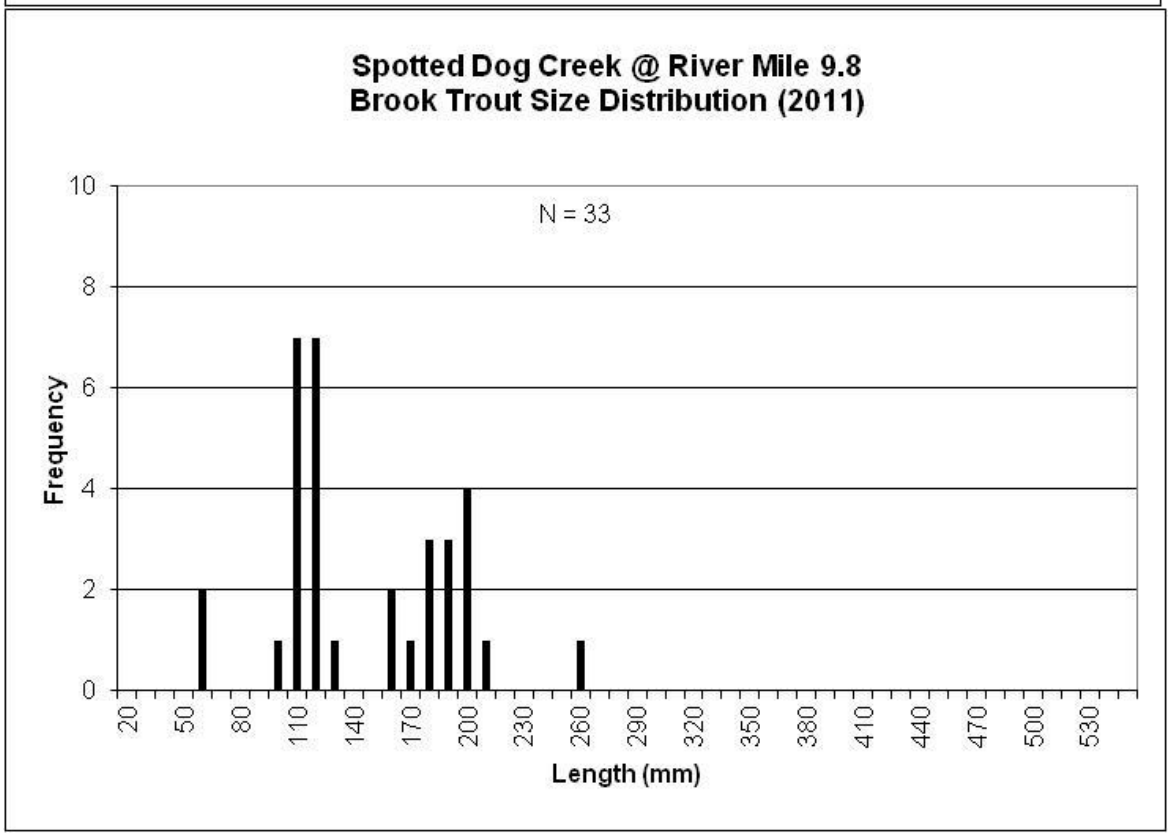
290
320
350
380
410
440
470
500
530
Length (mm)


Spotted Dog Creek @ River Mile 9.8
Brook Trout Size Distribution (2011)
N = 33
Frequency
0
2
4
6
8
10
20
50
80
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170
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230
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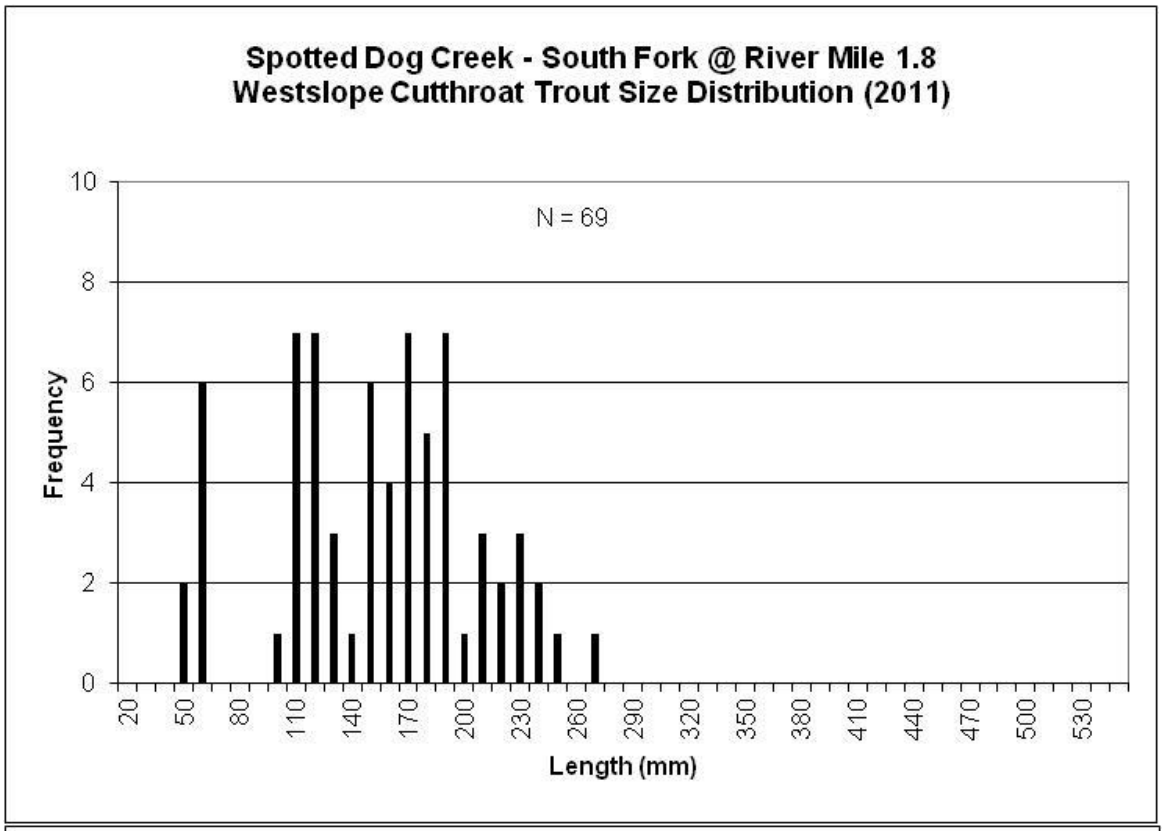
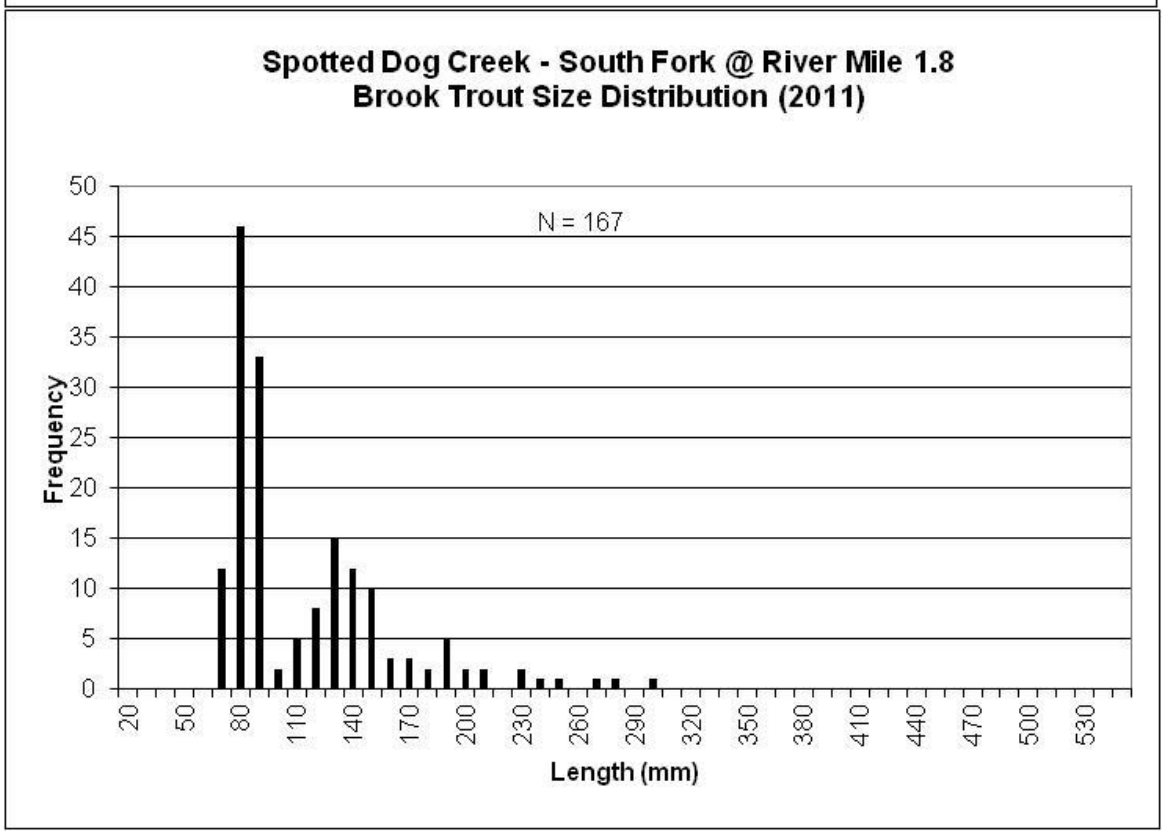
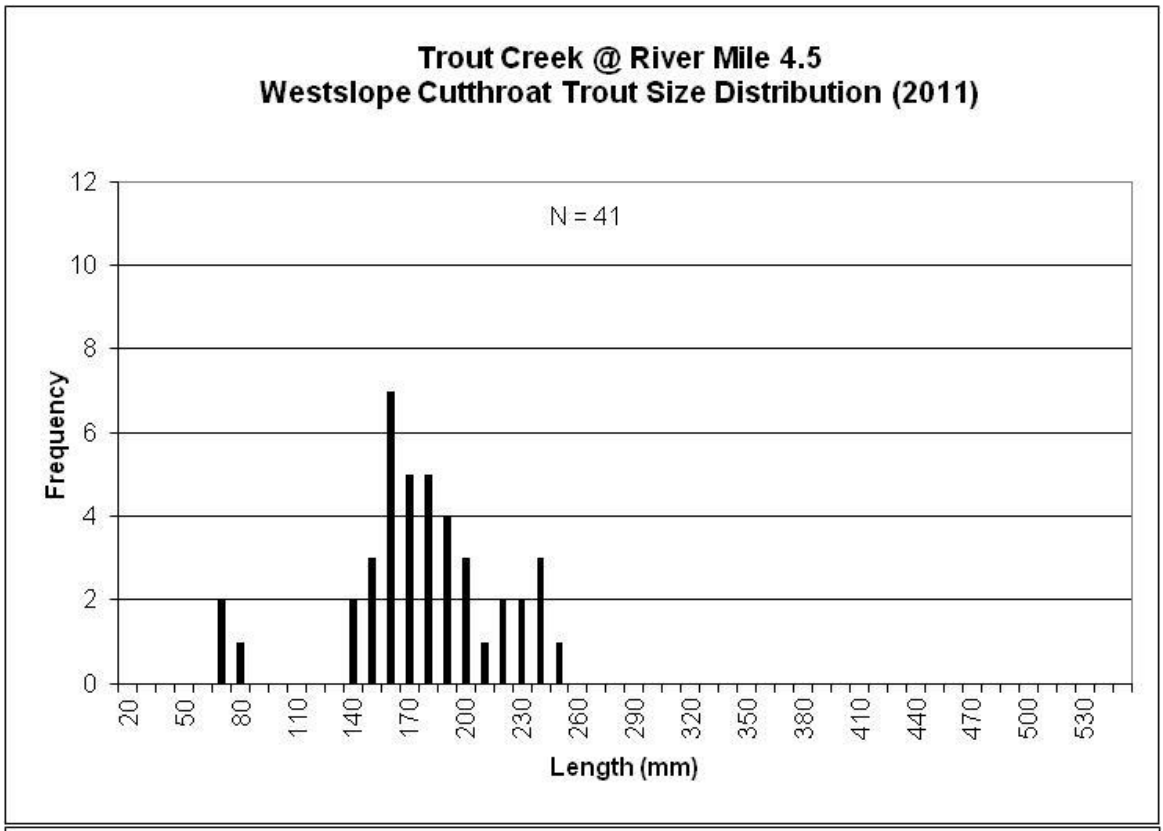
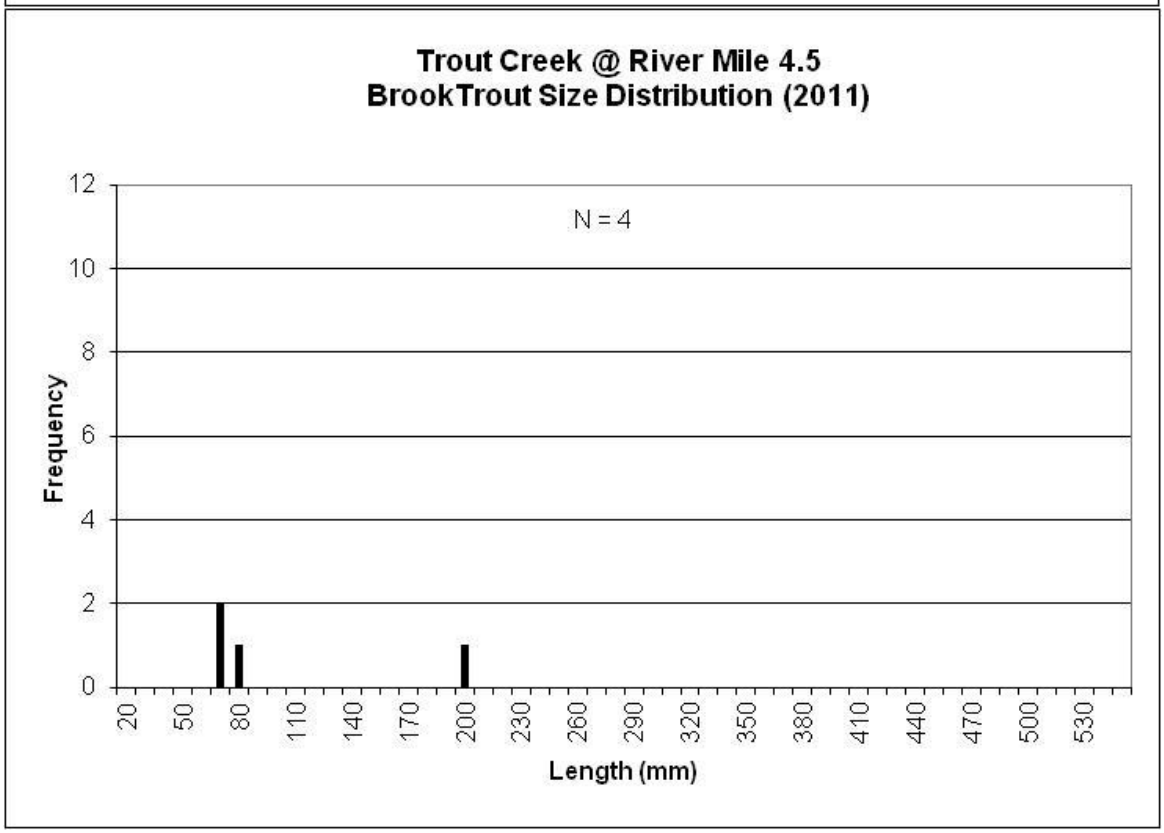
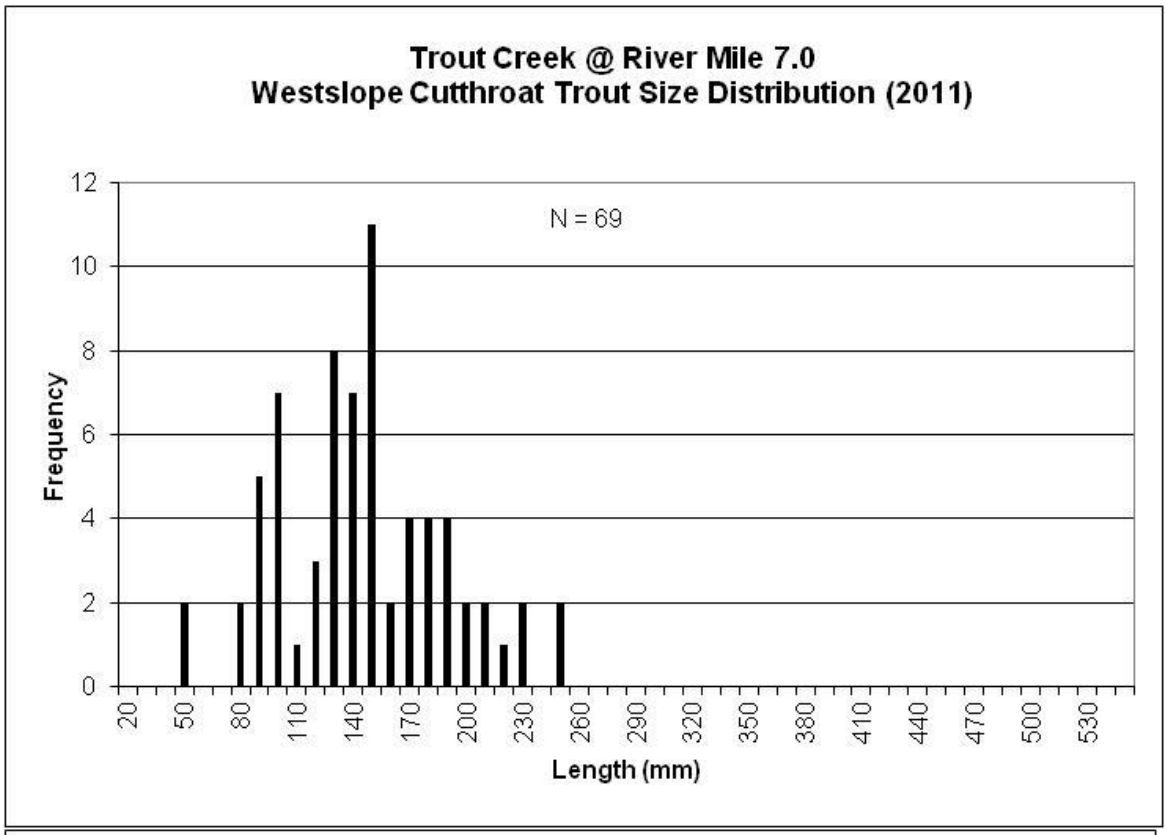
290
320
350
380
410
440
470
500
530
Length (mm)

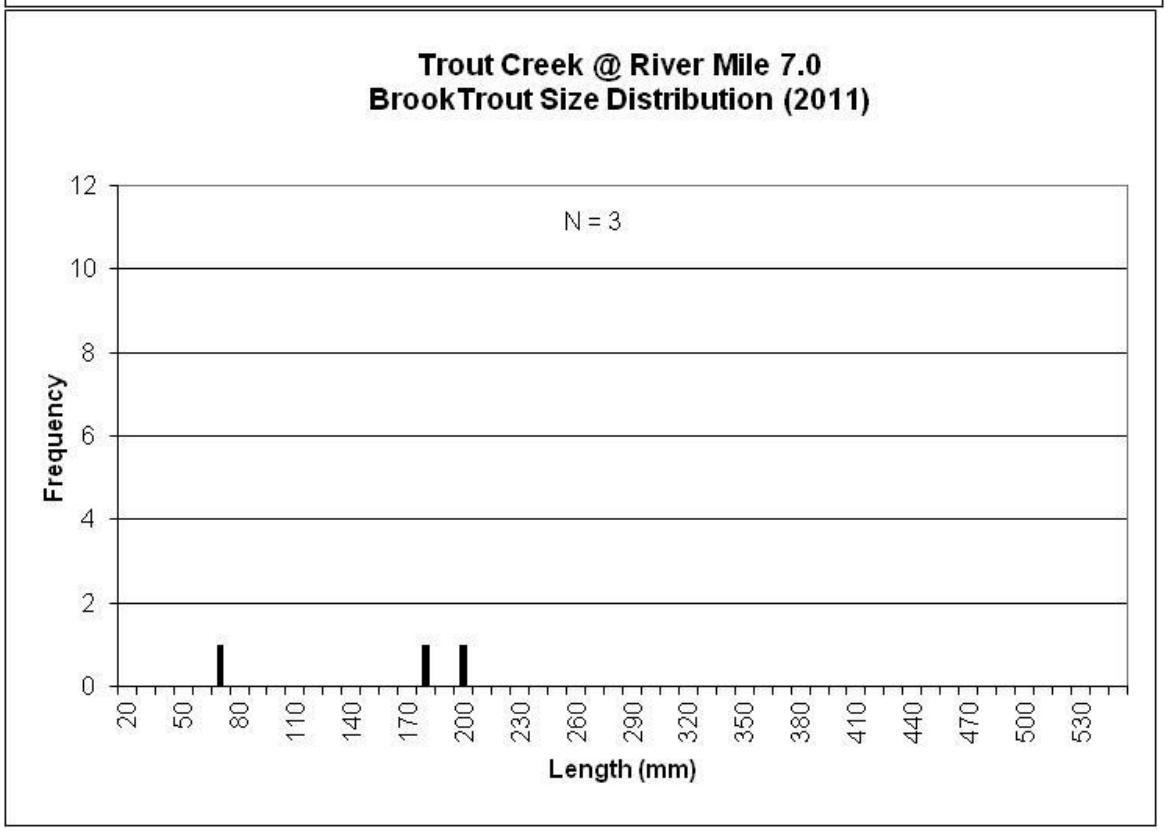

Spotted Dog Creek - South Fork @ River Mile 1.8
Westslope Cutthroat Trout Size Distribution (2011)
N = 69
Frequency
Length (mm)

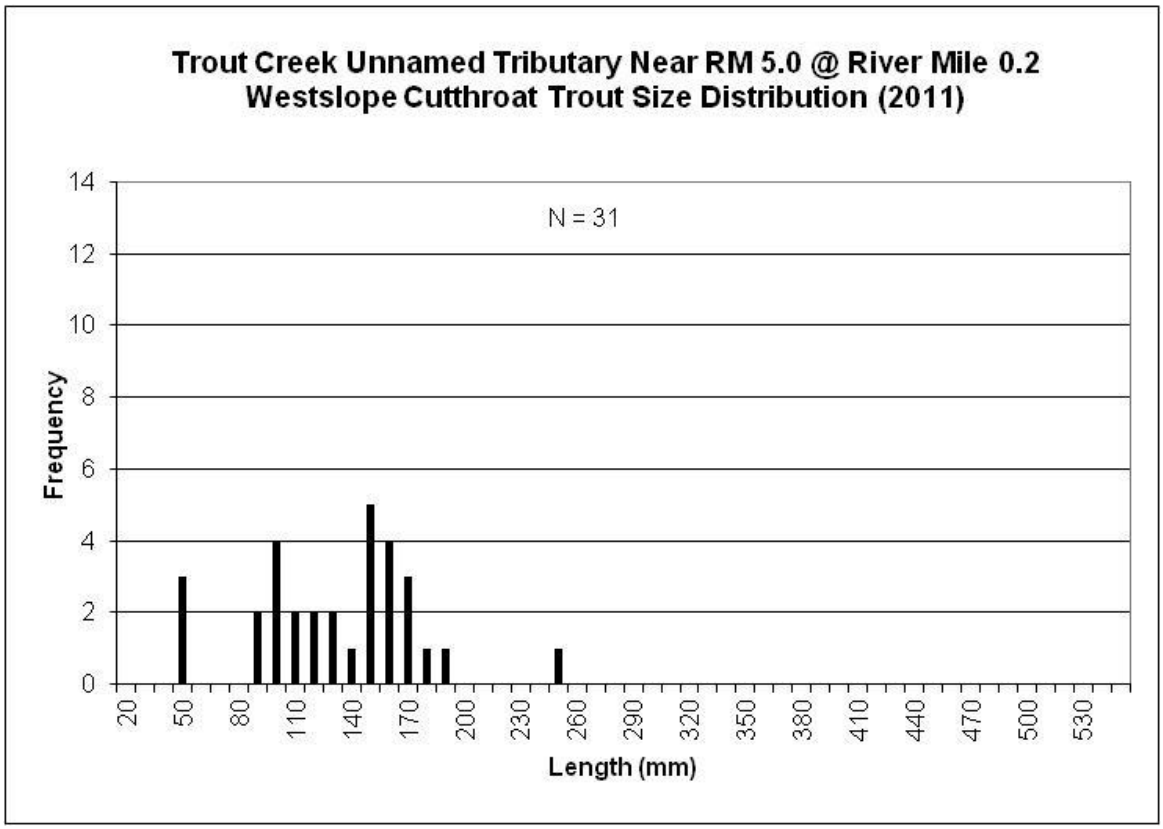

Spotted Dog Creek - South Fork @ River Mile 1.8
Brook Trout Size Distribution (2011)
N = 167
Frequency
Length (mm)

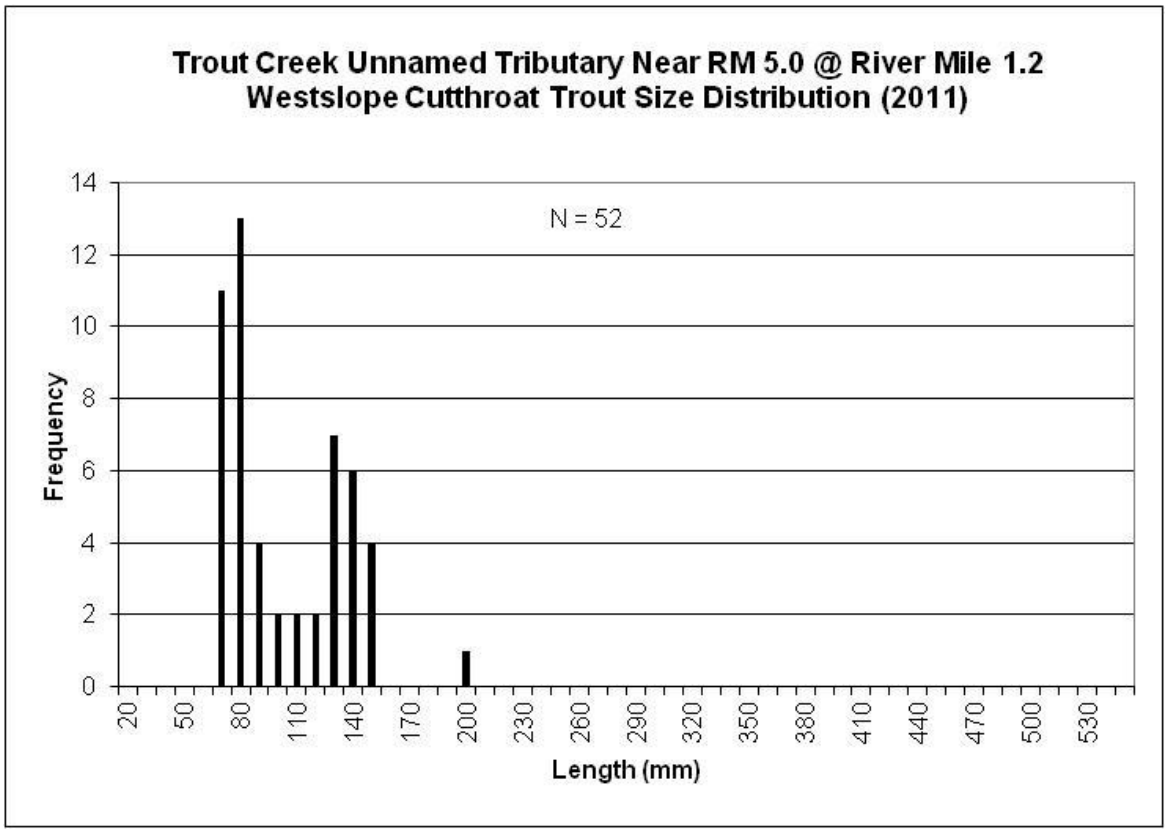

Trout Creek @ River Mile 4.5
Westslope Cutthroat Trout Size Distribution (2011)
N = 41
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

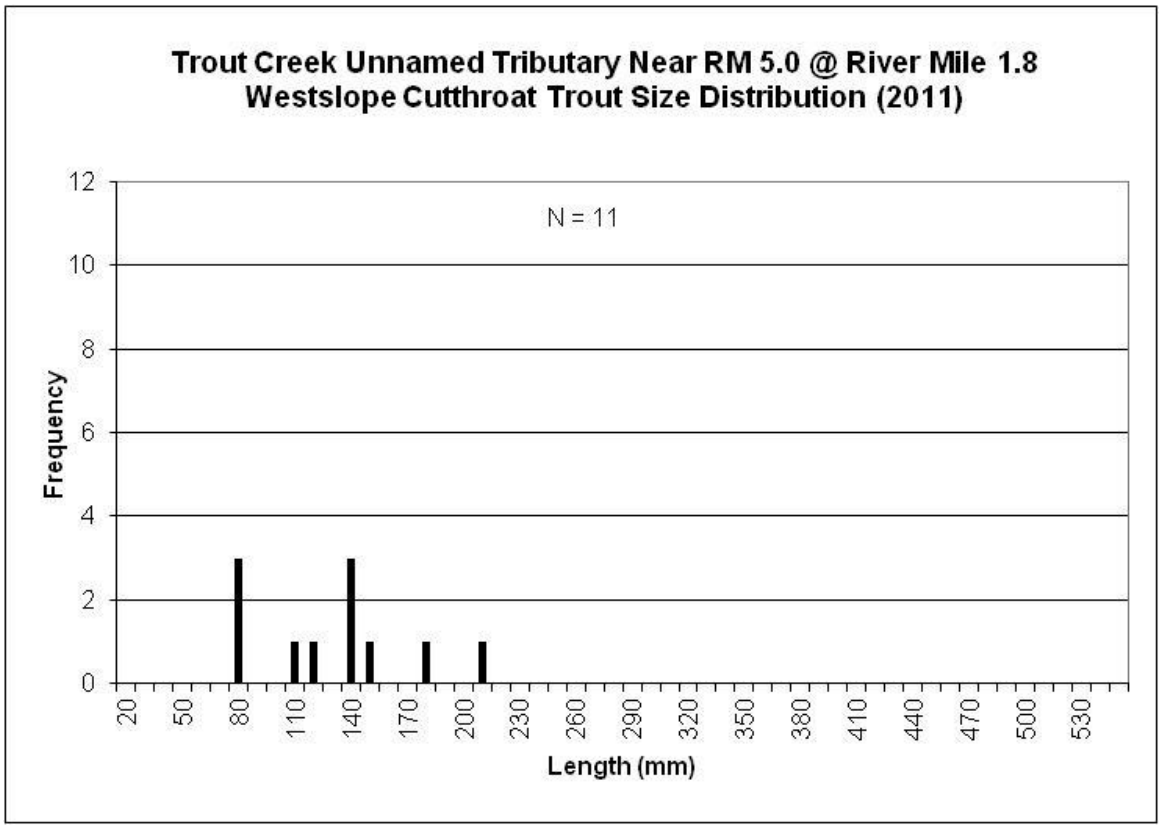

Trout Creek @ River Mile 4.5
BrookTrout Size Distribution (2011)
N = 4
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

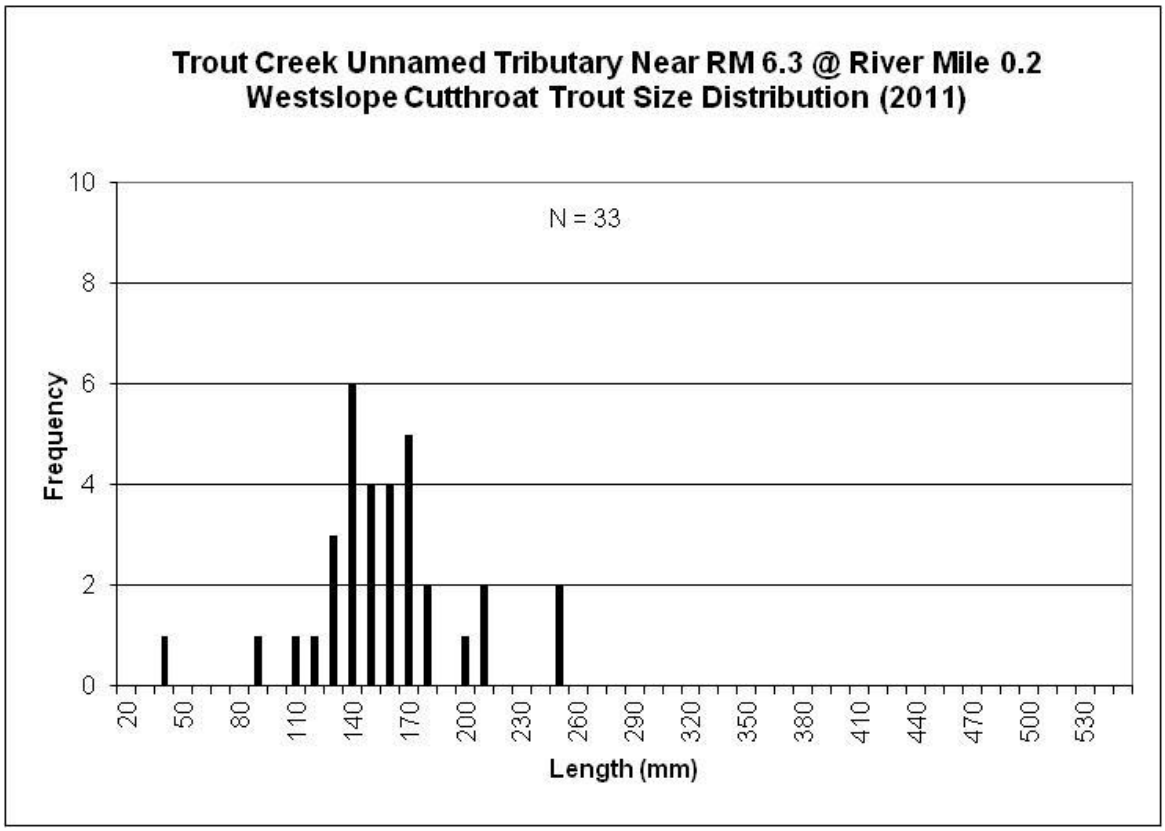

Trout Creek @ River Mile 7.0
Westslope Cutthroat Trout Size Distribution (2011)
N = 69
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

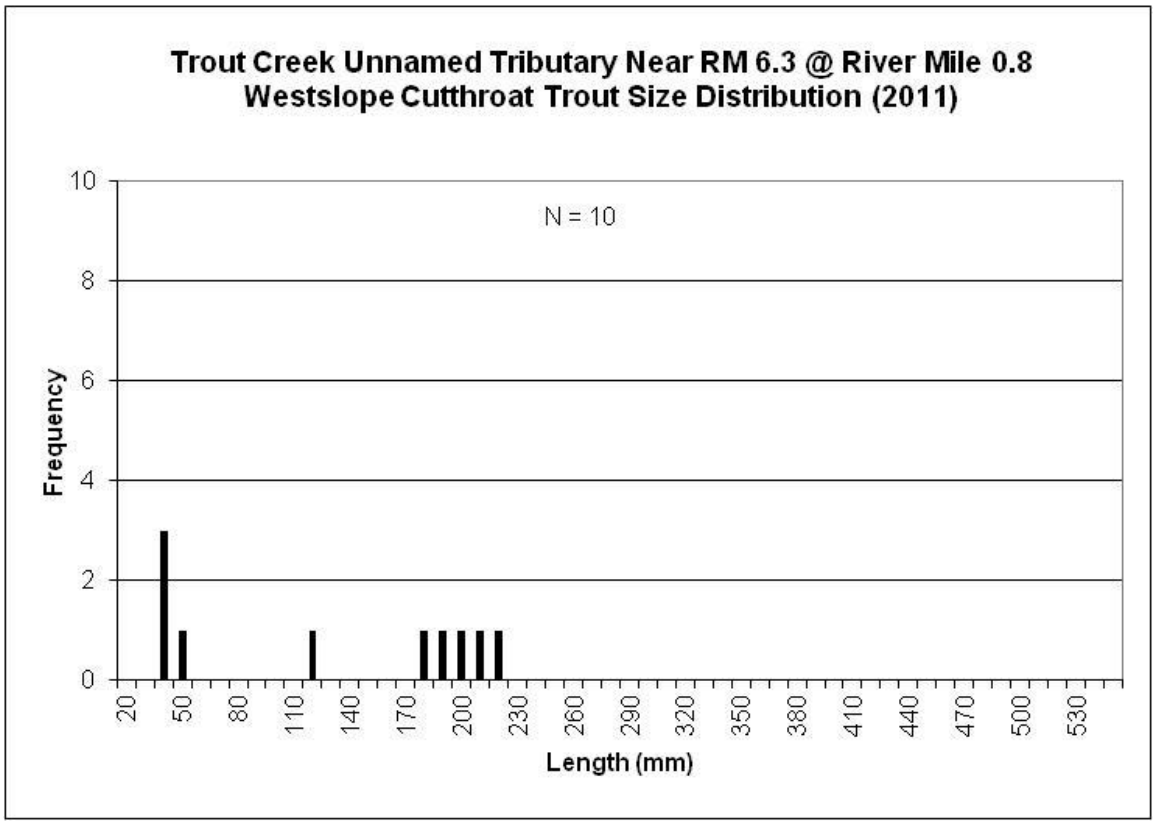

Trout Creek @ River Mile 7.0
BrookTrout Size Distribution (2011)
N = 3
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

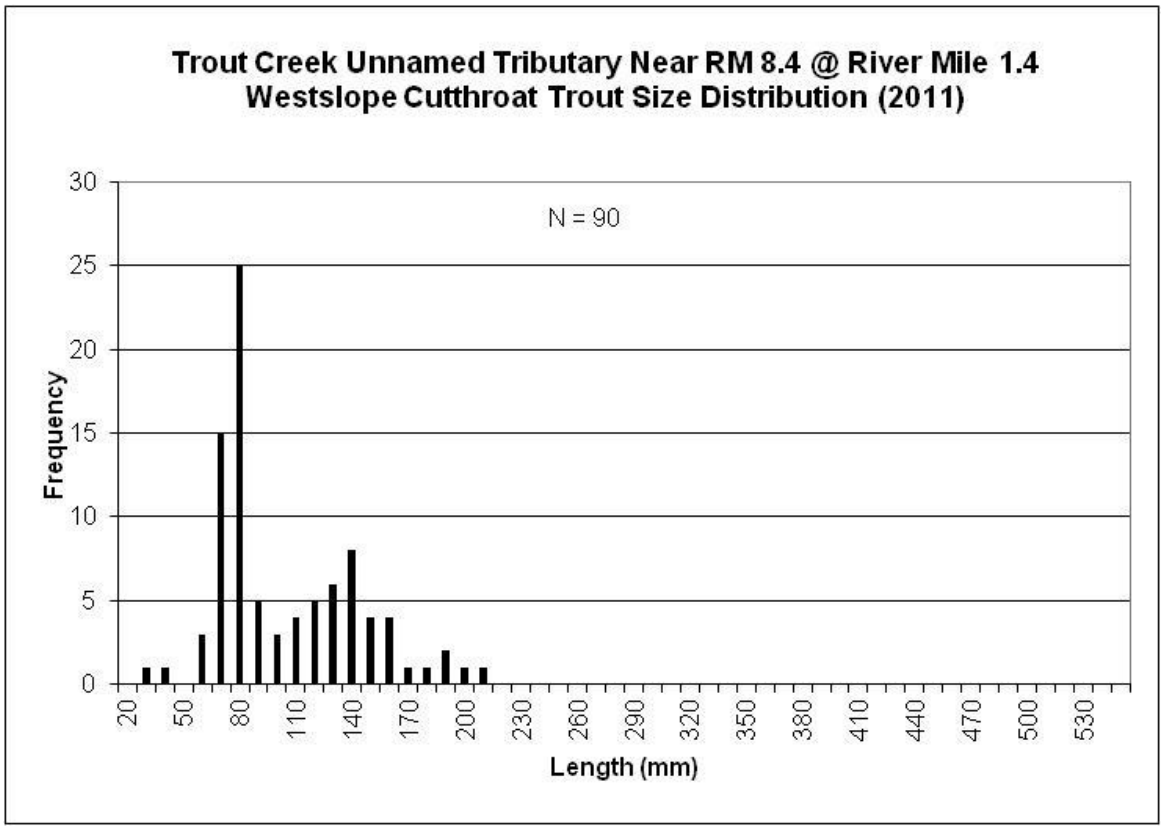

Trout Creek Unnamed Tributary Near RM 5.0 @ River Mile 0.2
Westslope Cutthroat Trout Size Distribution (2011)
N = 31
Frequency
0
2
4
6
8
10
12
14
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

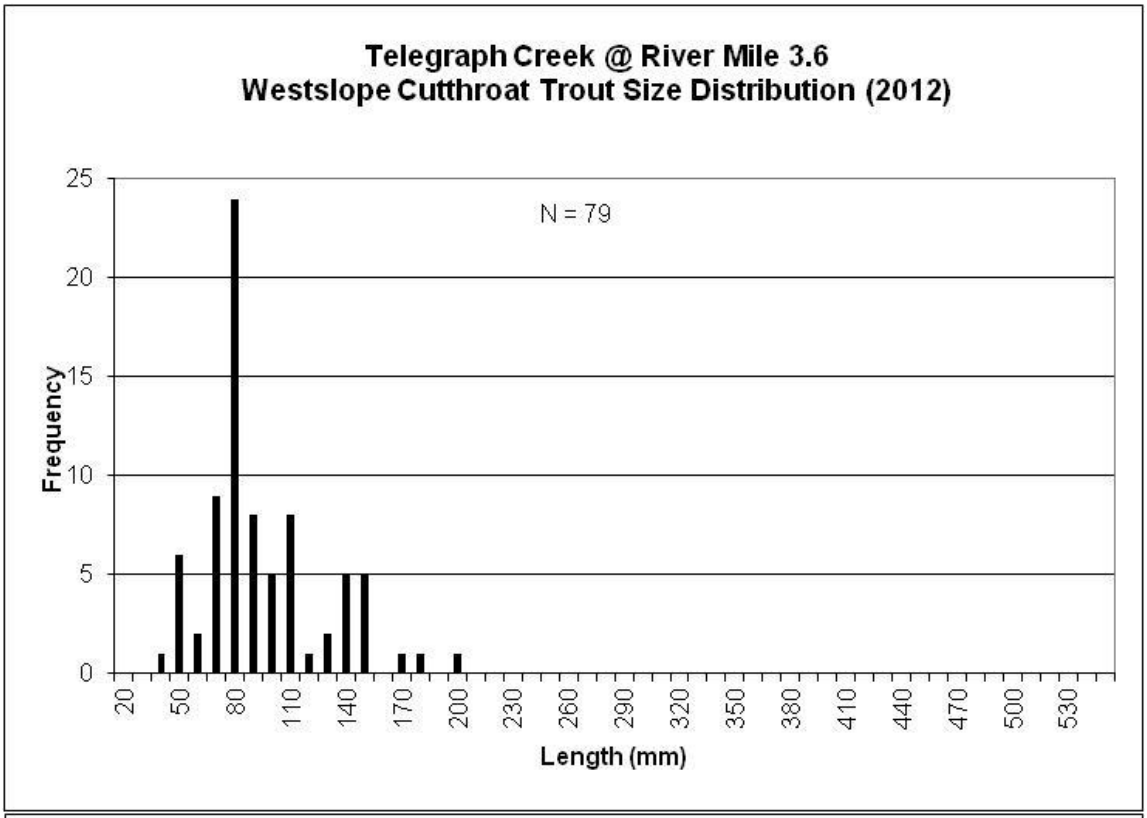

Trout Creek Unnamed Tributary Near RM 5.0 @ River Mile 1.2
Westslope Cutthroat Trout Size Distribution (2011)
N = 52
Frequency
0
2
4
6
8
10
12
14
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

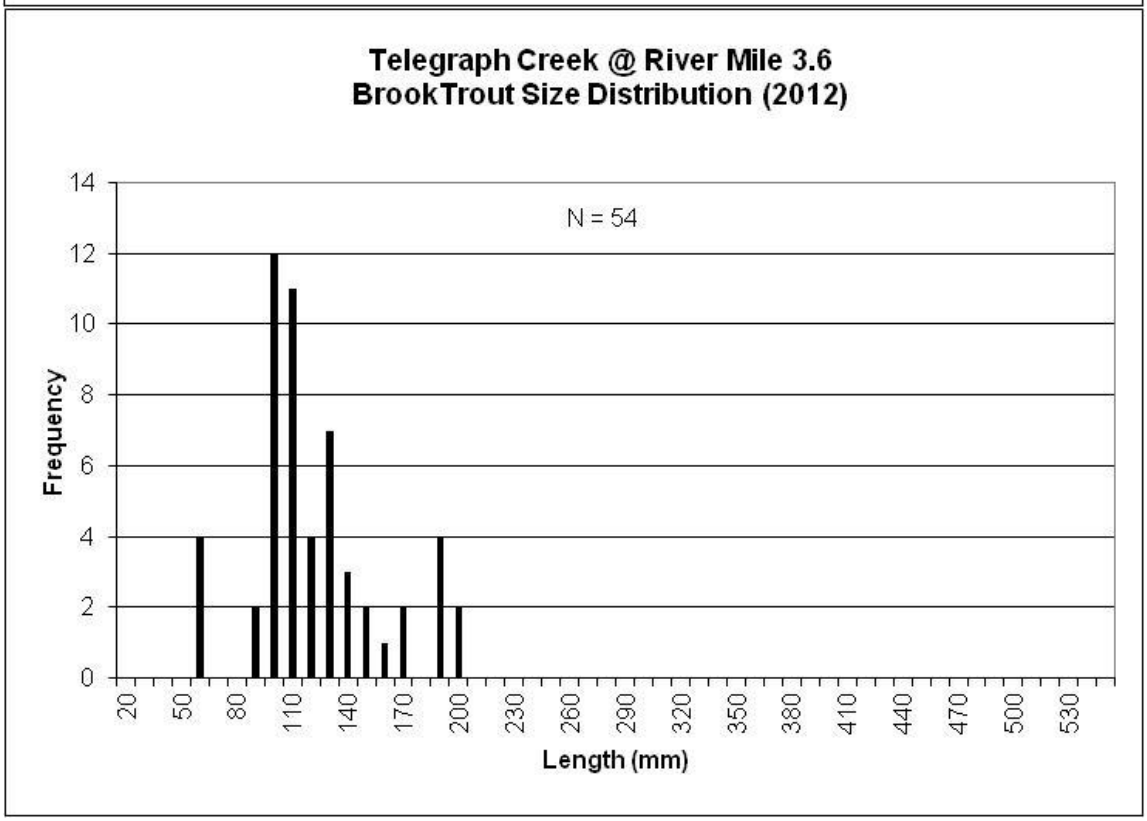

Trout Creek Unnamed Tributary Near RM 5.0 @ River Mile 1.8
Westslope Cutthroat Trout Size Distribution (2011)
N = 11
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

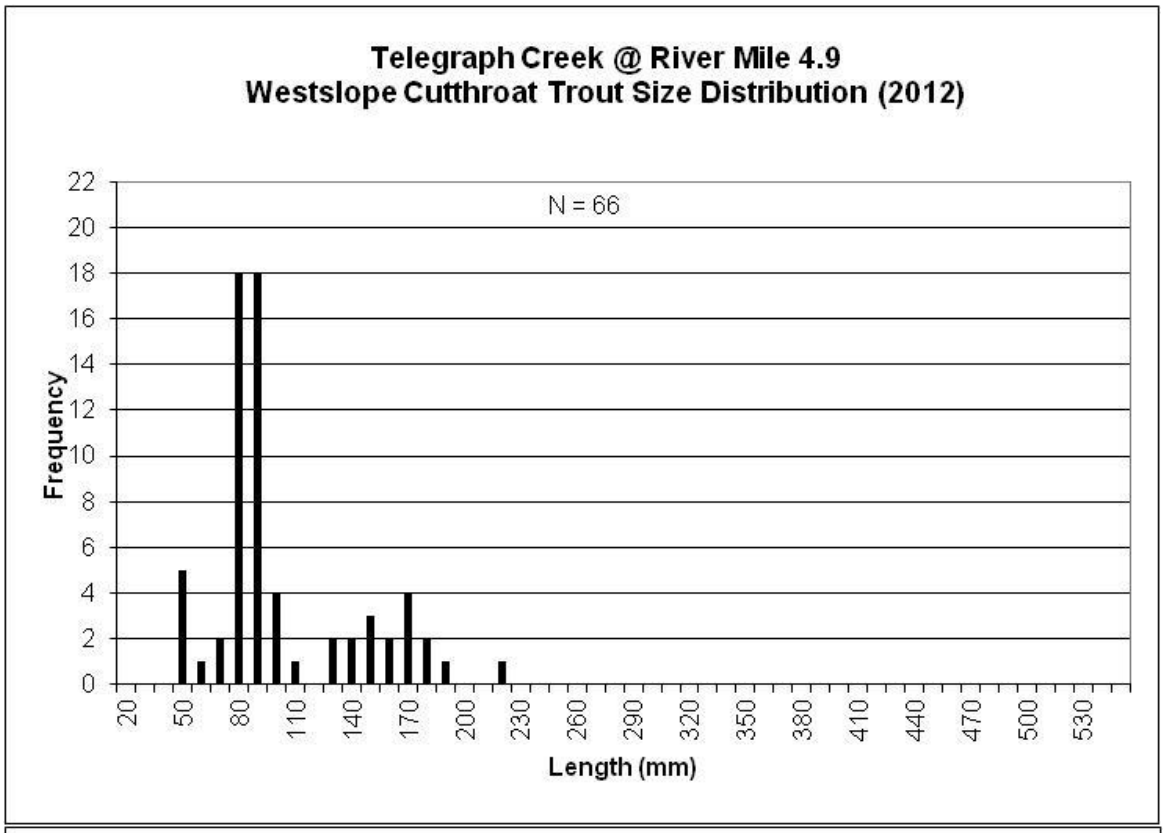

Trout Creek Unnamed Tributary Near RM 6.3 @ River Mile 0.2
Westslope Cutthroat Trout Size Distribution (2011)
N = 33
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

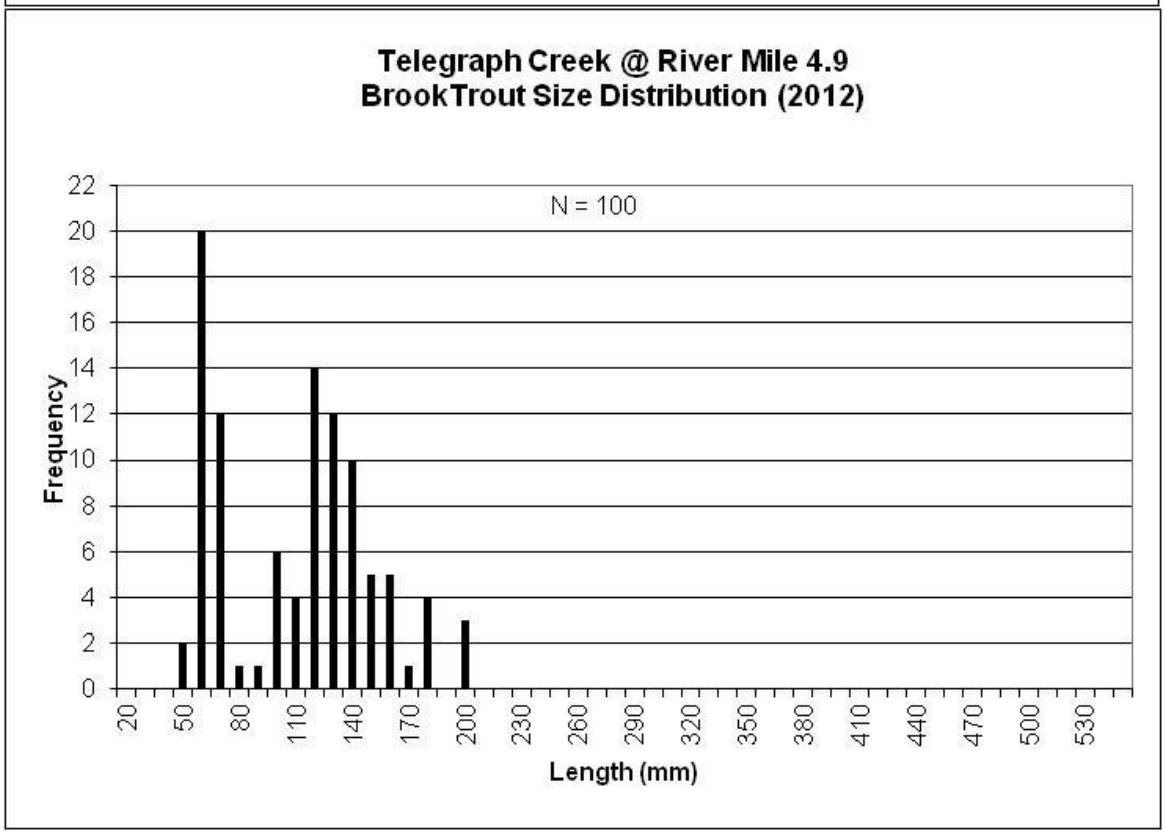

Trout Creek Unnamed Tributary Near RM 6.3 @ River Mile 0.8
Westslope Cutthroat Trout Size Distribution (2011)
N = 10
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

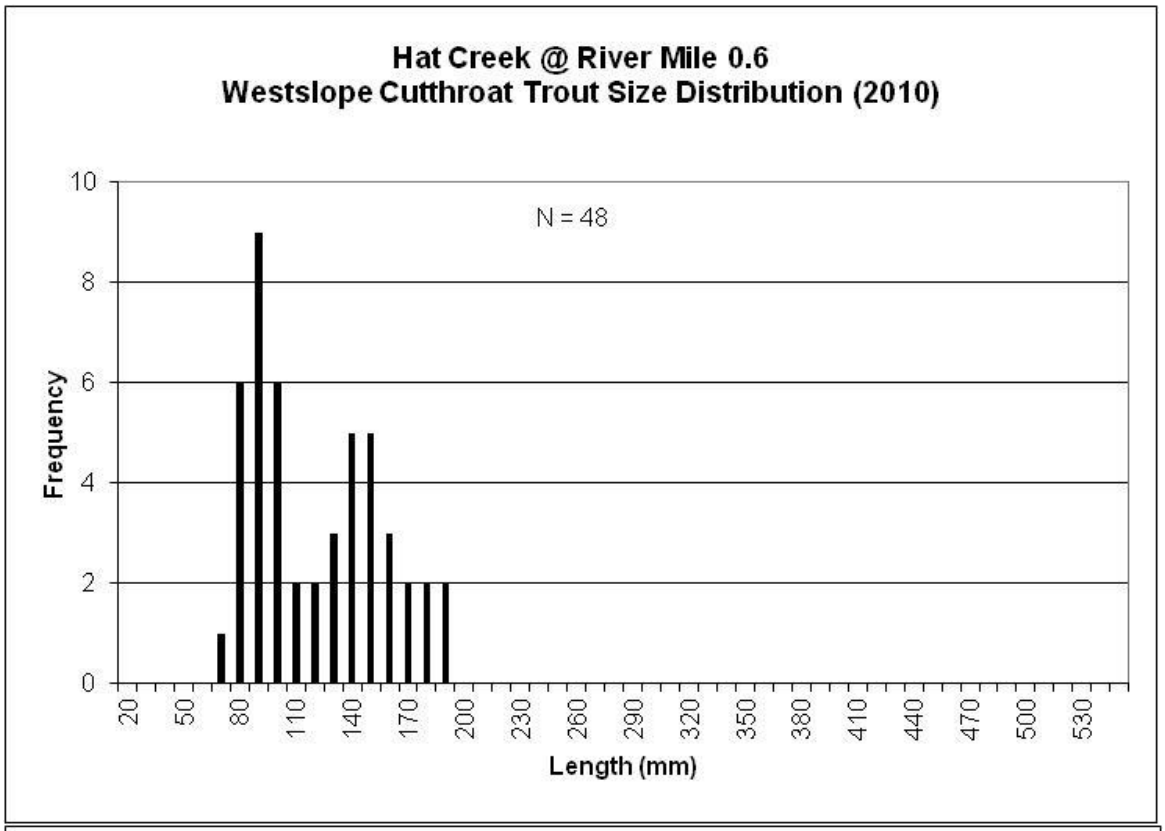

Trout Creek Unnamed Tributary Near RM 8.4 @ River Mile 1.4
Westslope Cutthroat Trout Size Distribution (2011)
N = 90
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

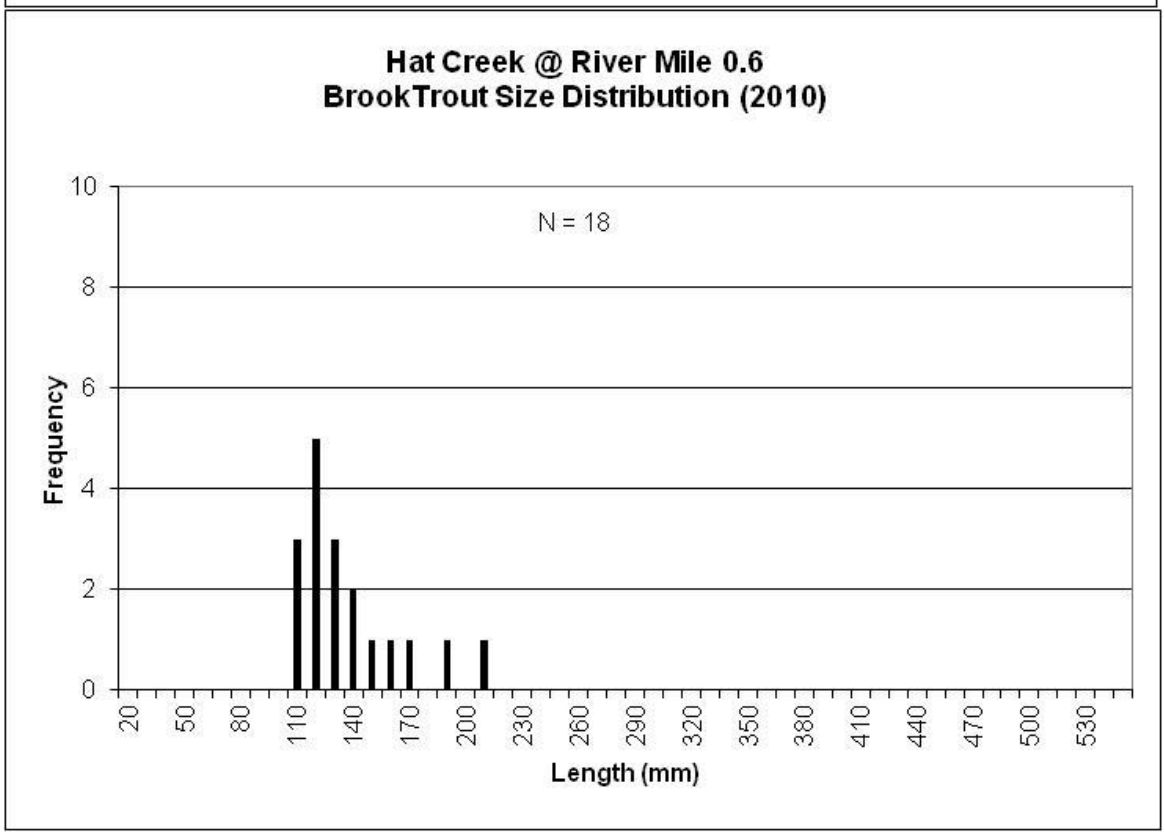

Telegraph Creek @ River Mile 3.6
Westslope Cutthroat Trout Size Distribution (2012)
N = 79
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

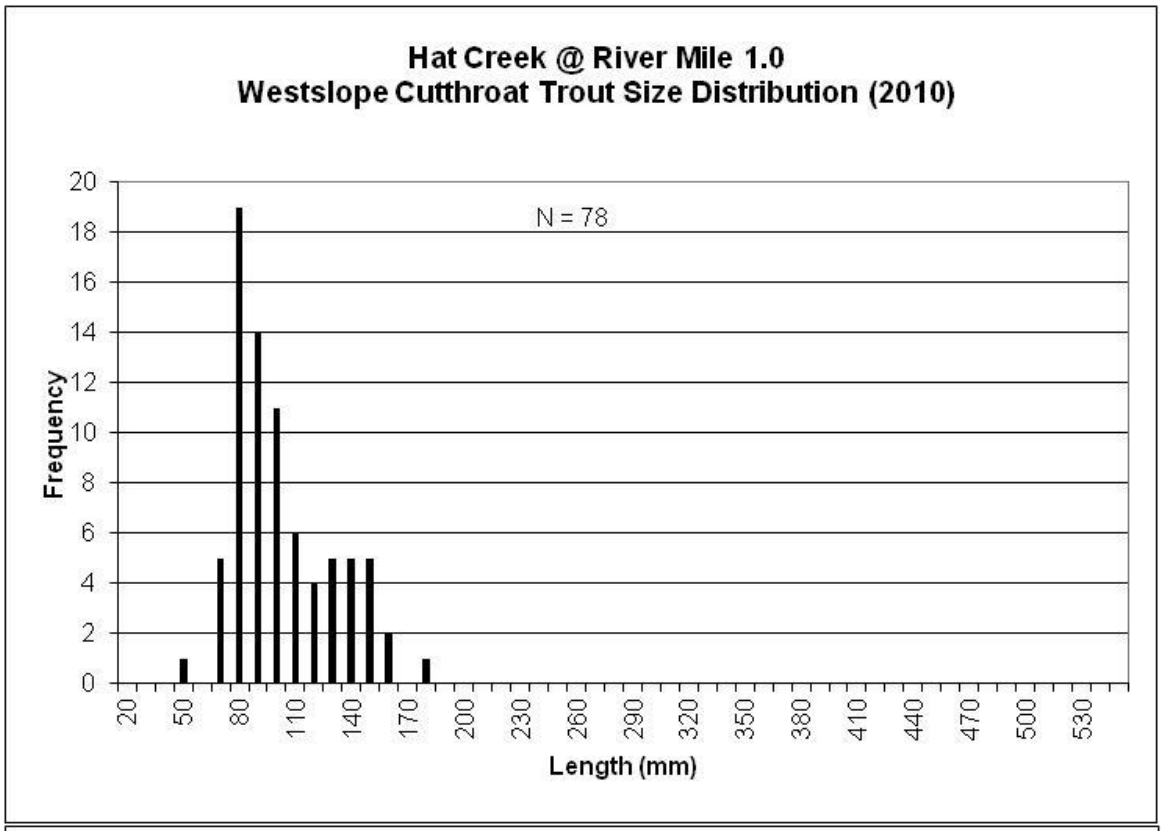

Telegraph Creek @ River Mile 3.6
BrookTrout Size Distribution (2012)
N = 54
Frequency
0
2
4
6
8
10
12
14
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

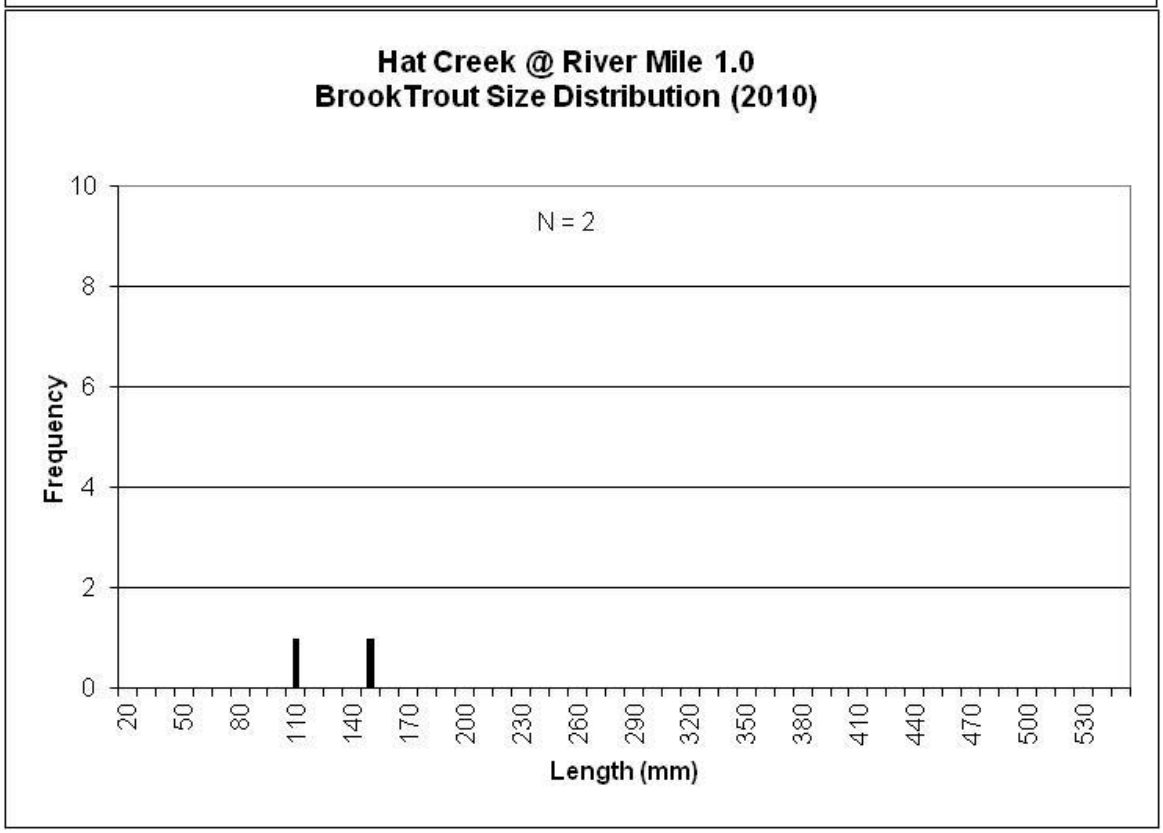

Telegraph Creek @ River Mile 4.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 66
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

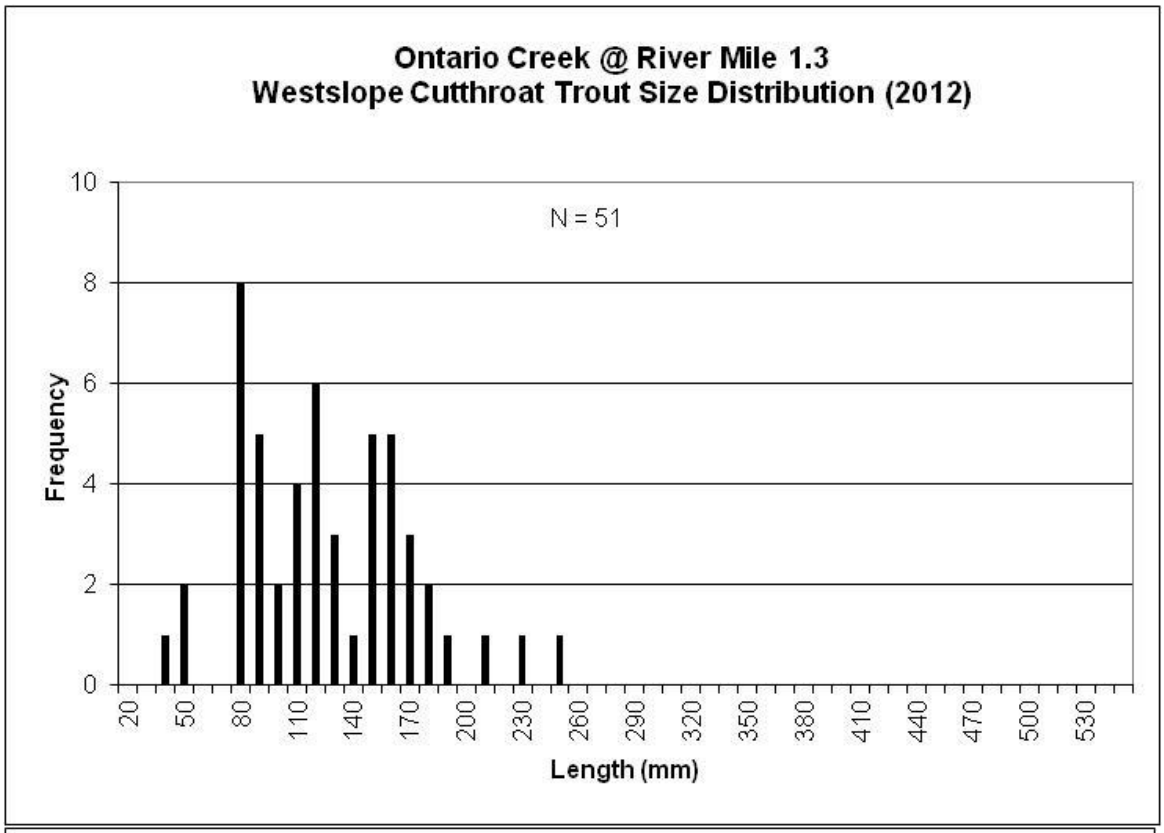

Telegraph Creek @ River Mile 4.9
BrookTrout Size Distribution (2012)
N = 100
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

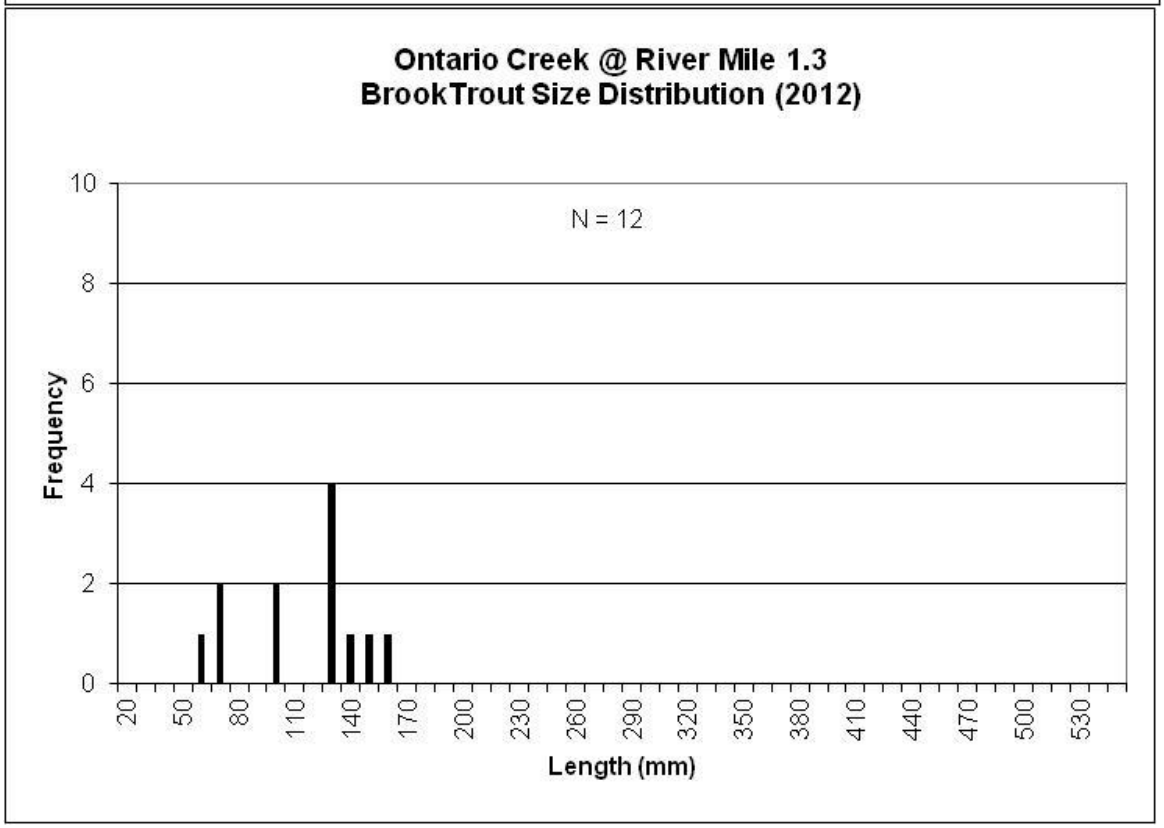

Hat Creek @ River Mile 0.6
Westslope Cutthroat Trout Size Distribution (2010)
N = 48
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

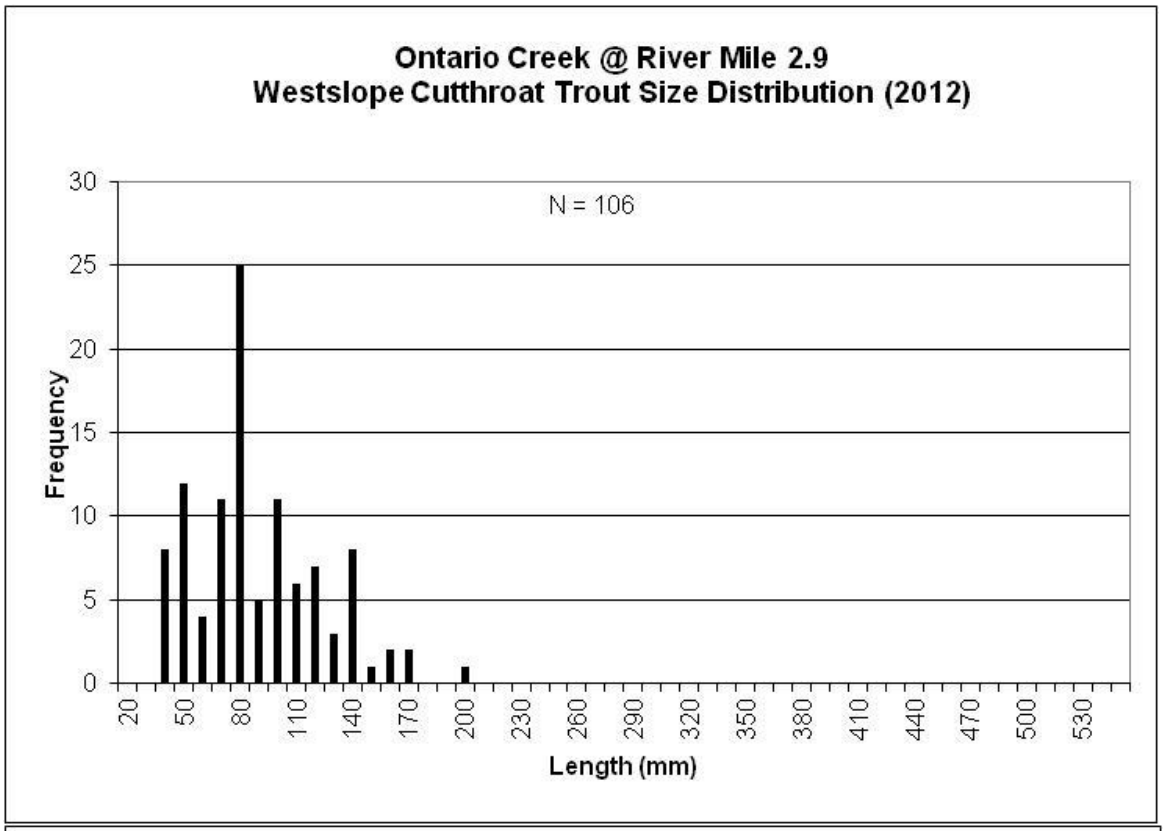

Hat Creek @ River Mile 0.6
BrookTrout Size Distribution (2010)
N = 18
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

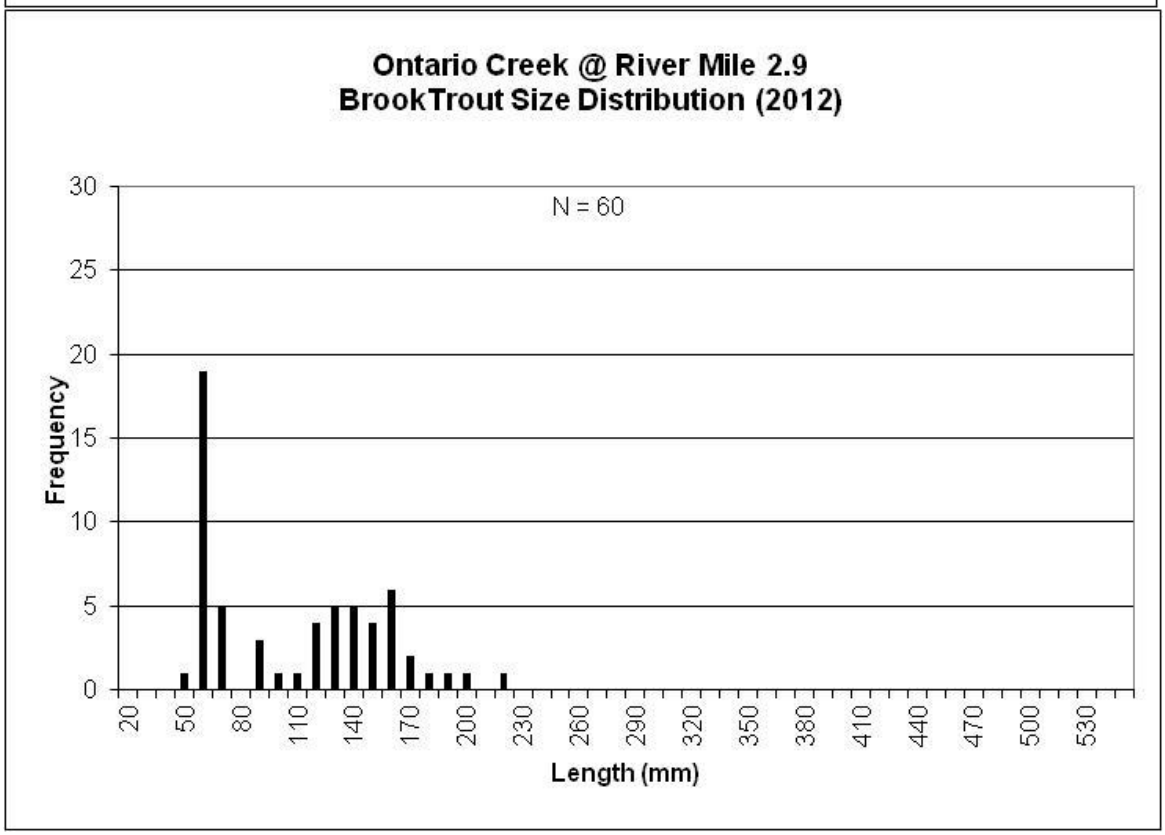

Hat Creek @ River Mile 1.0
Westslope Cutthroat Trout Size Distribution (2010)
N = 78
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

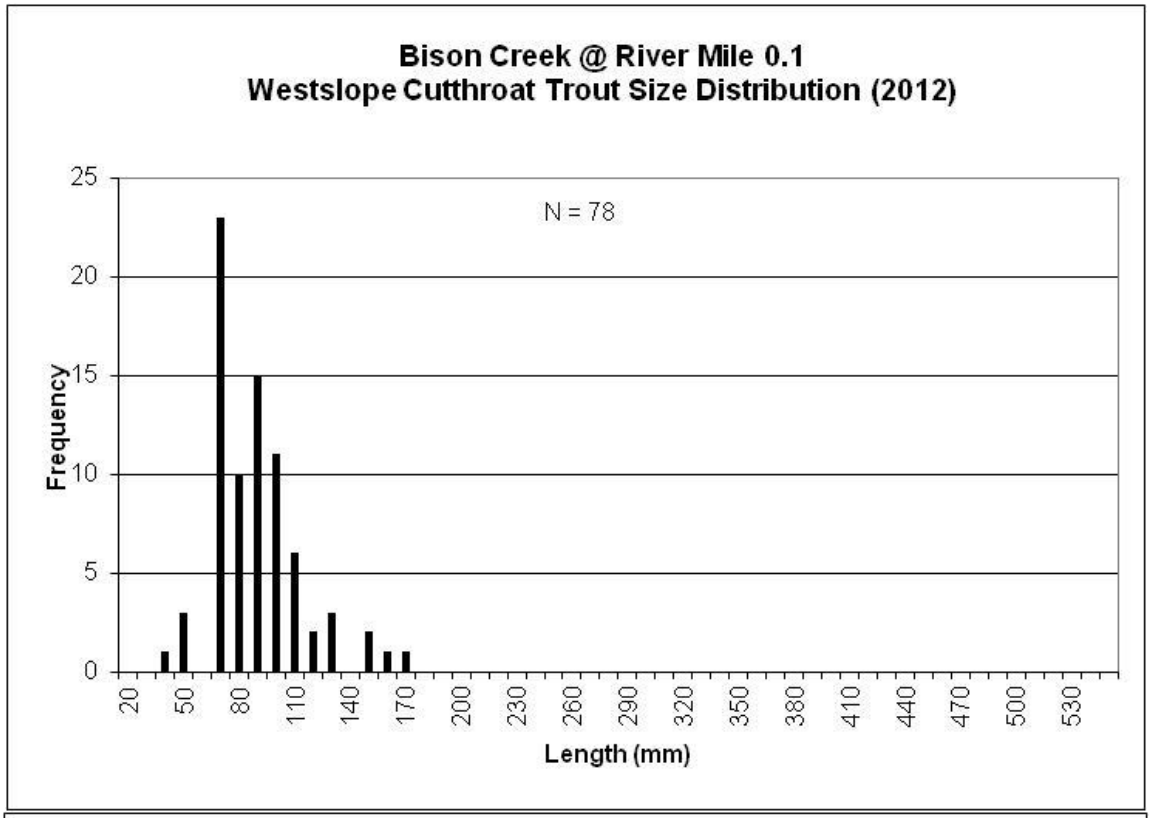

Hat Creek @ River Mile 1.0
BrookTrout Size Distribution (2010)
N = 2
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

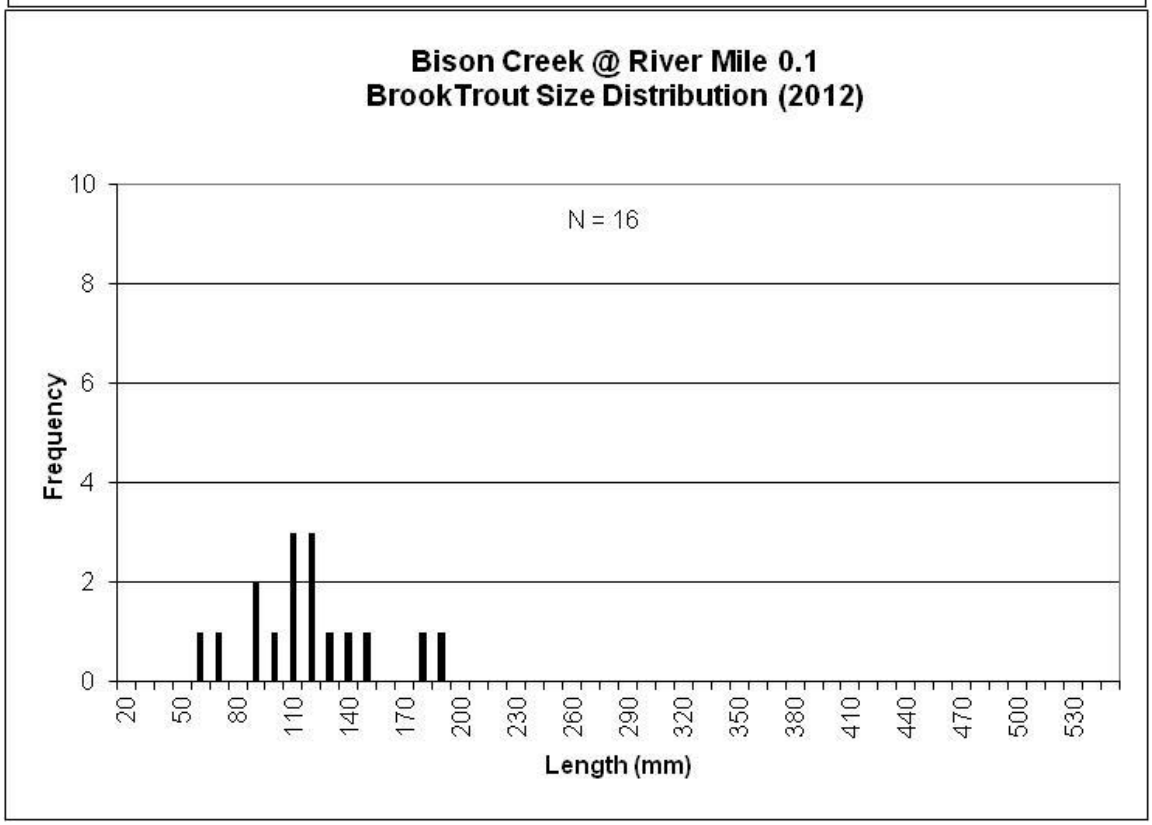

Ontario Creek @ River Mile 1.3
Westslope Cutthroat Trout Size Distribution (2012)
N = 51
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

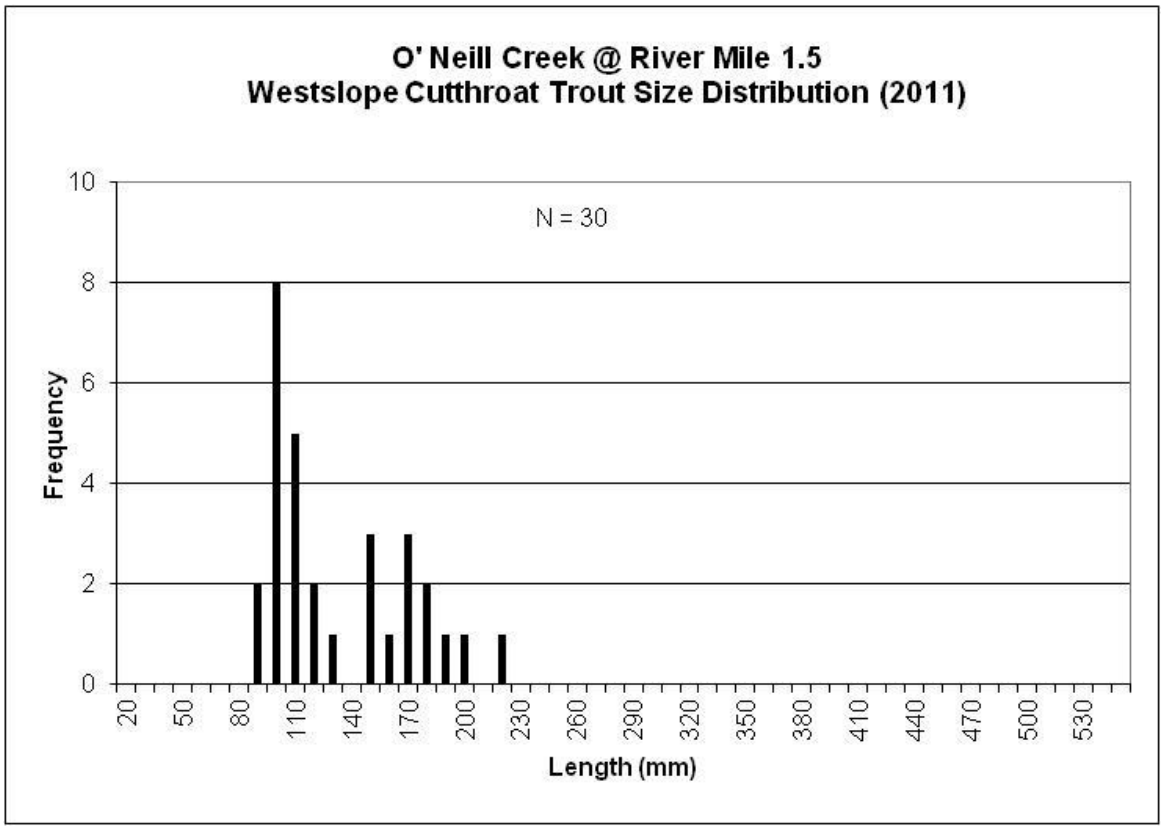

Ontario Creek @ River Mile 1.3
BrookTrout Size Distribution (2012)
N = 12
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

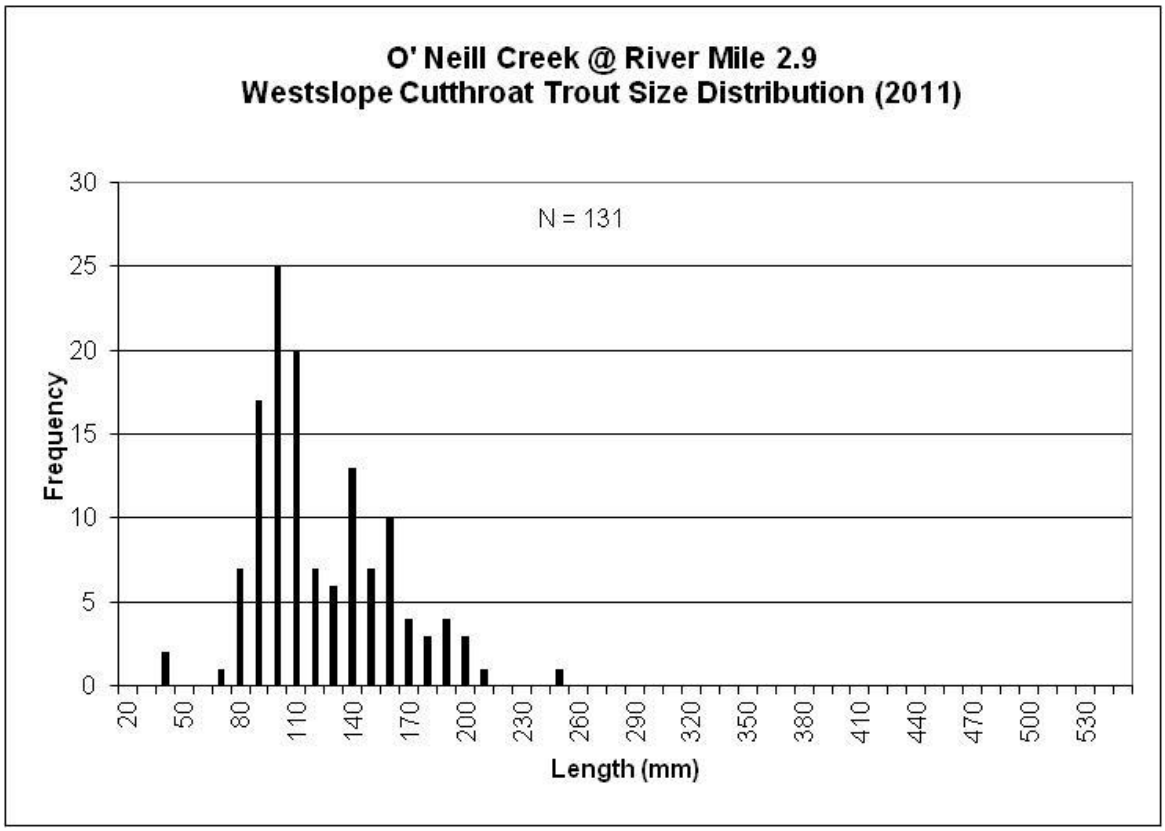

Ontario Creek @ River Mile 2.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 106
Frequency
Length (mm)
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

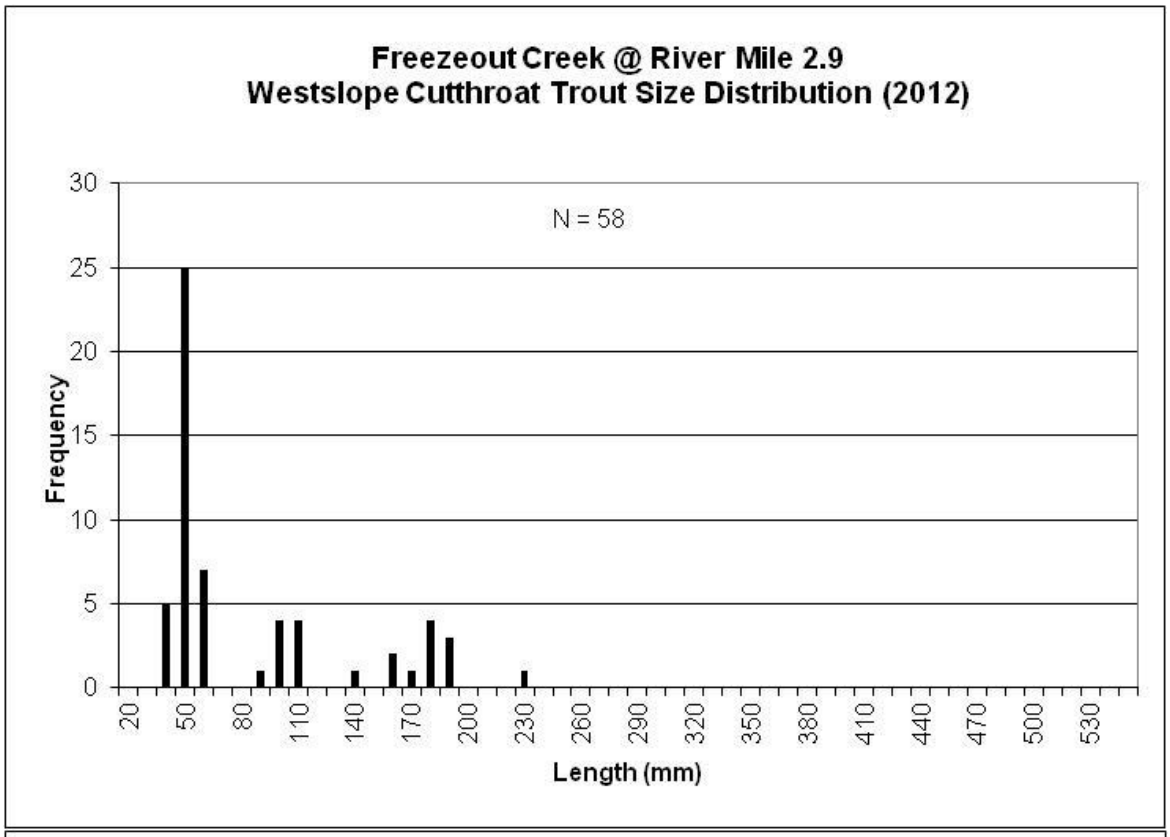

Ontario Creek @ River Mile 2.9
BrookTrout Size Distribution (2012)
N = 60
Frequency
Length (mm)
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

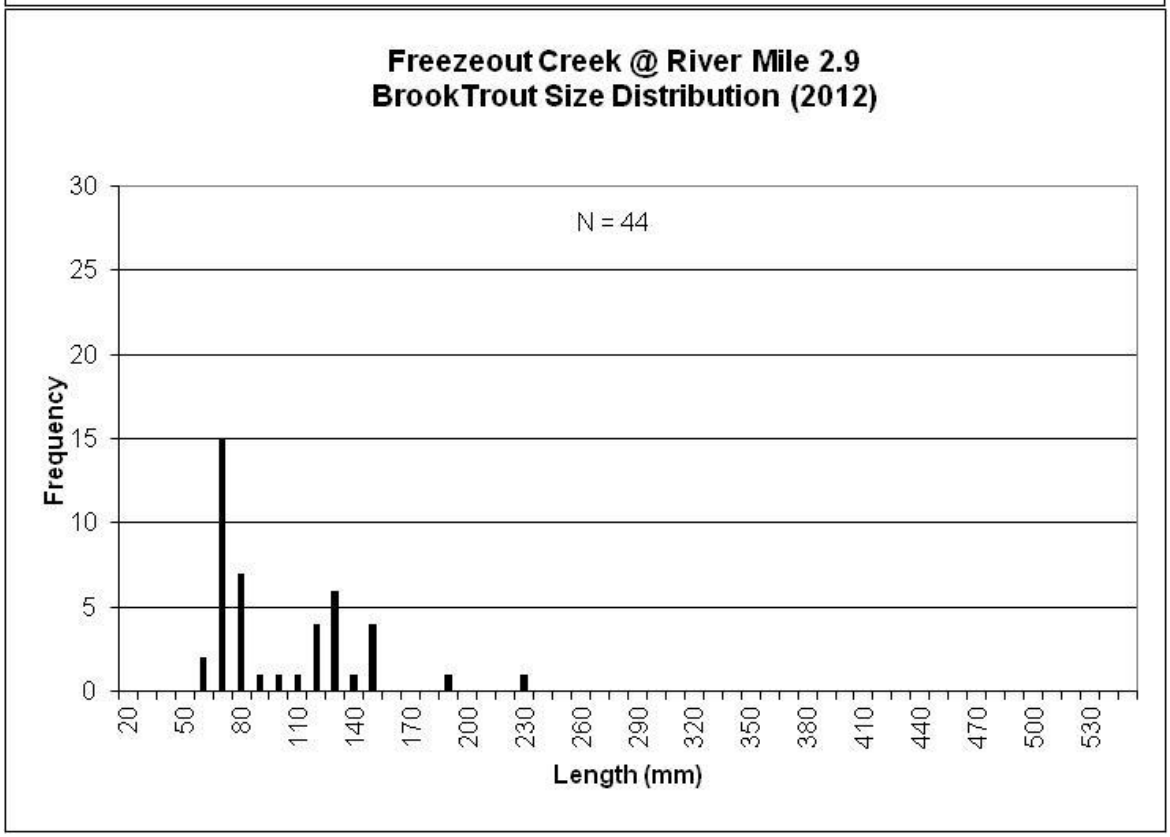

Bison Creek @ River Mile 0.1
Westslope Cutthroat Trout Size Distribution (2012)
N = 78
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

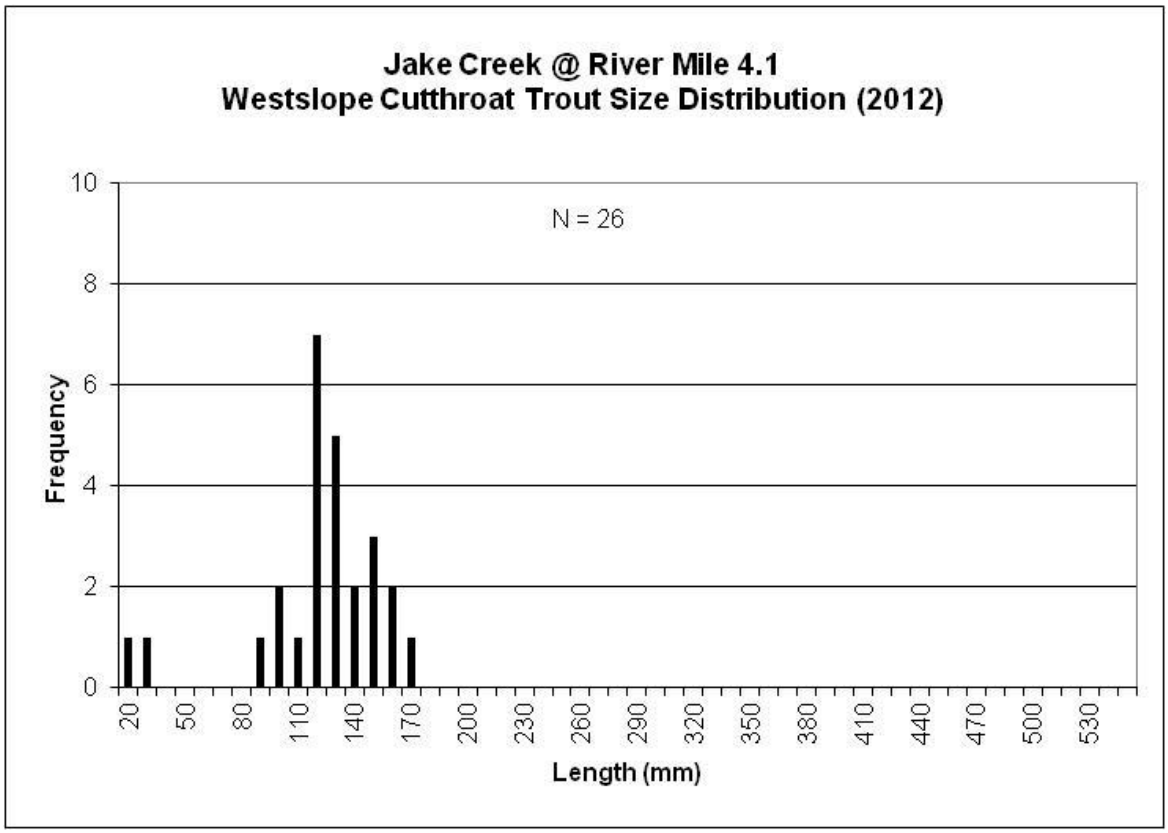

Bison Creek @ River Mile 0.1
BrookTrout Size Distribution (2012)
N = 16
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

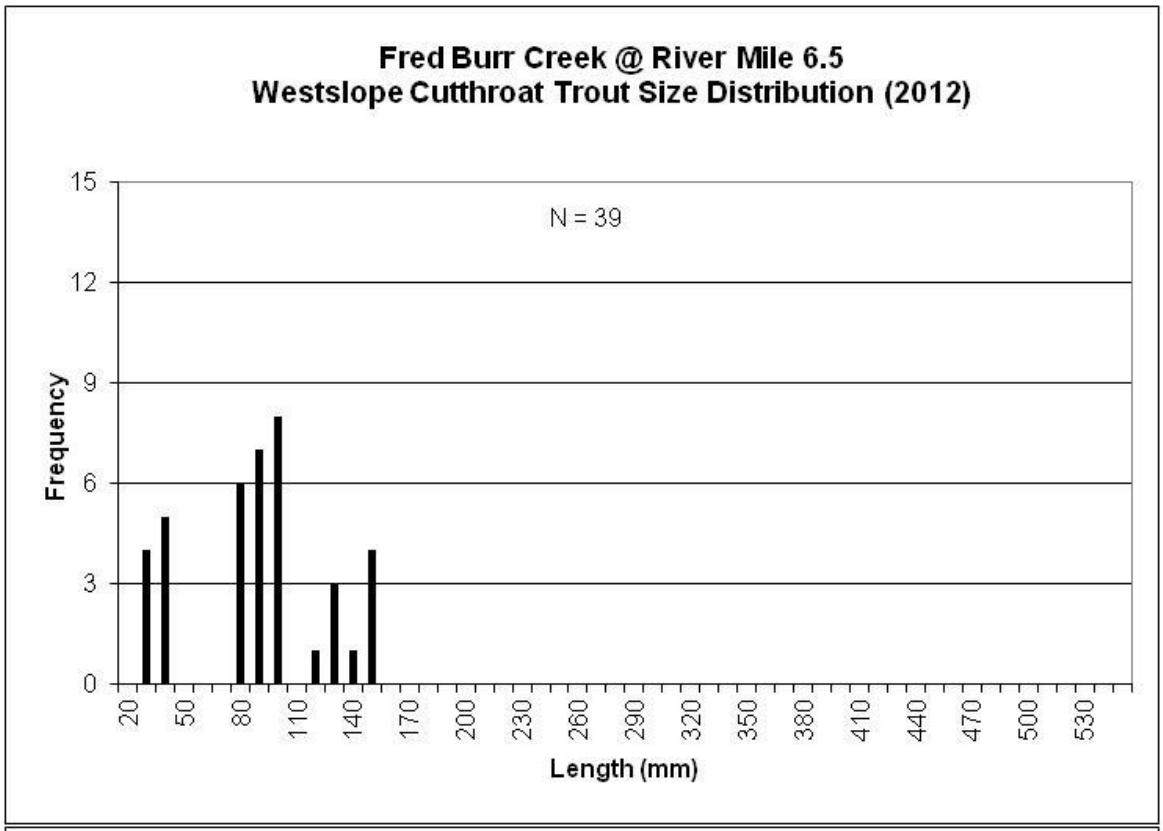

O' Neill Creek @ River Mile 1.5
Westslope Cutthroat Trout Size Distribution (2011)
N = 30
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

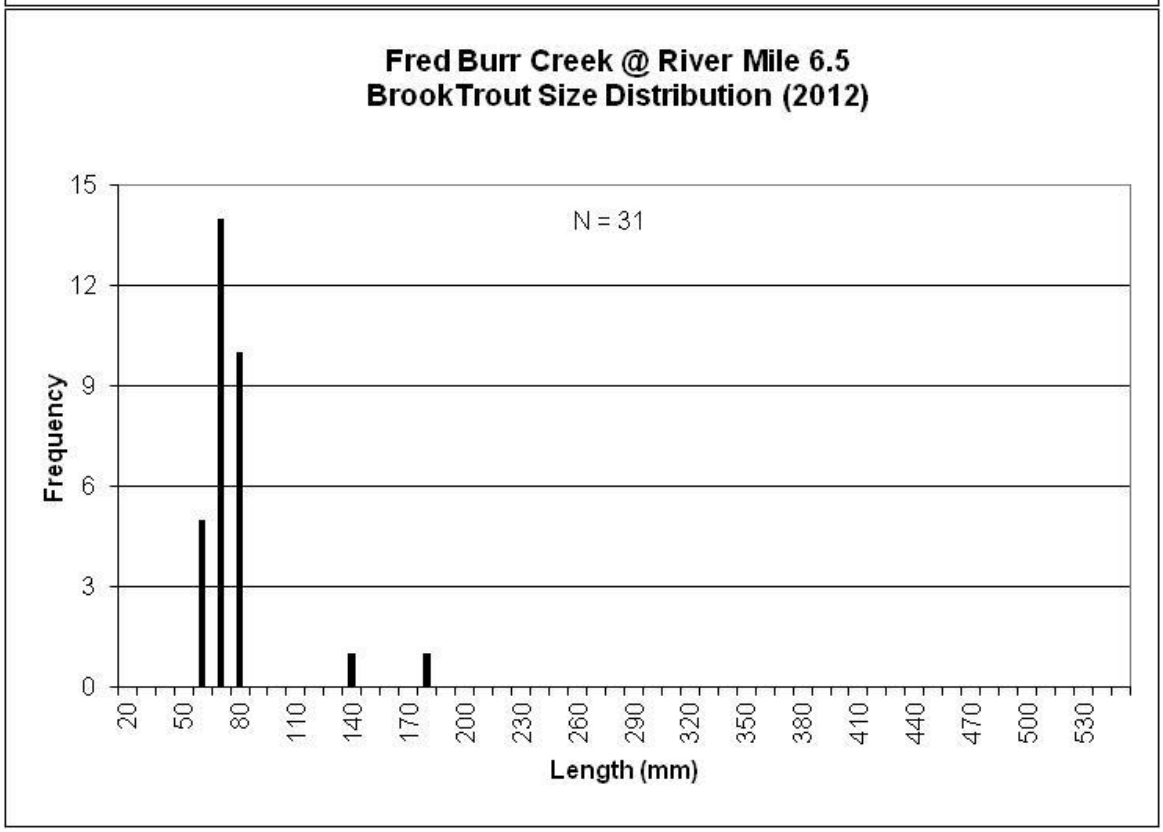

O' Neill Creek @ River Mile 2.9
Westslope Cutthroat Trout Size Distribution (2011)
N = 131
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

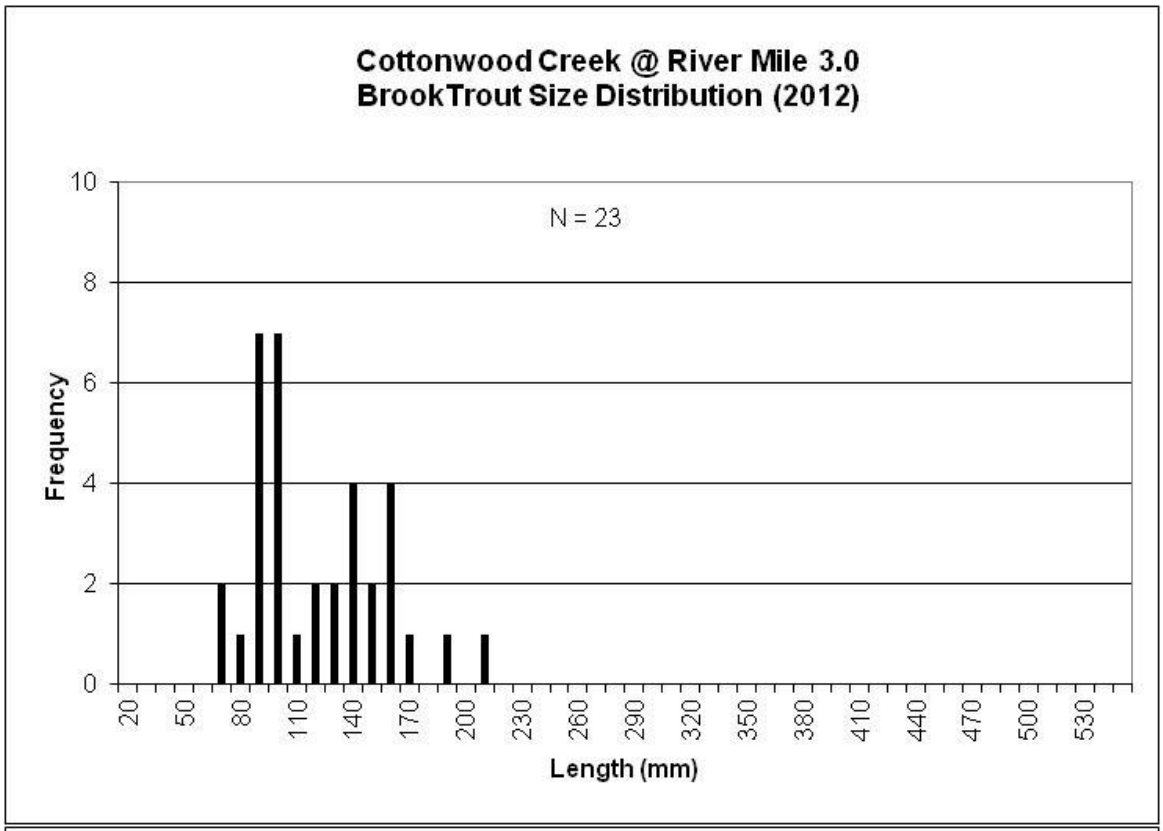

Freezeout Creek @ River Mile 2.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 58
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

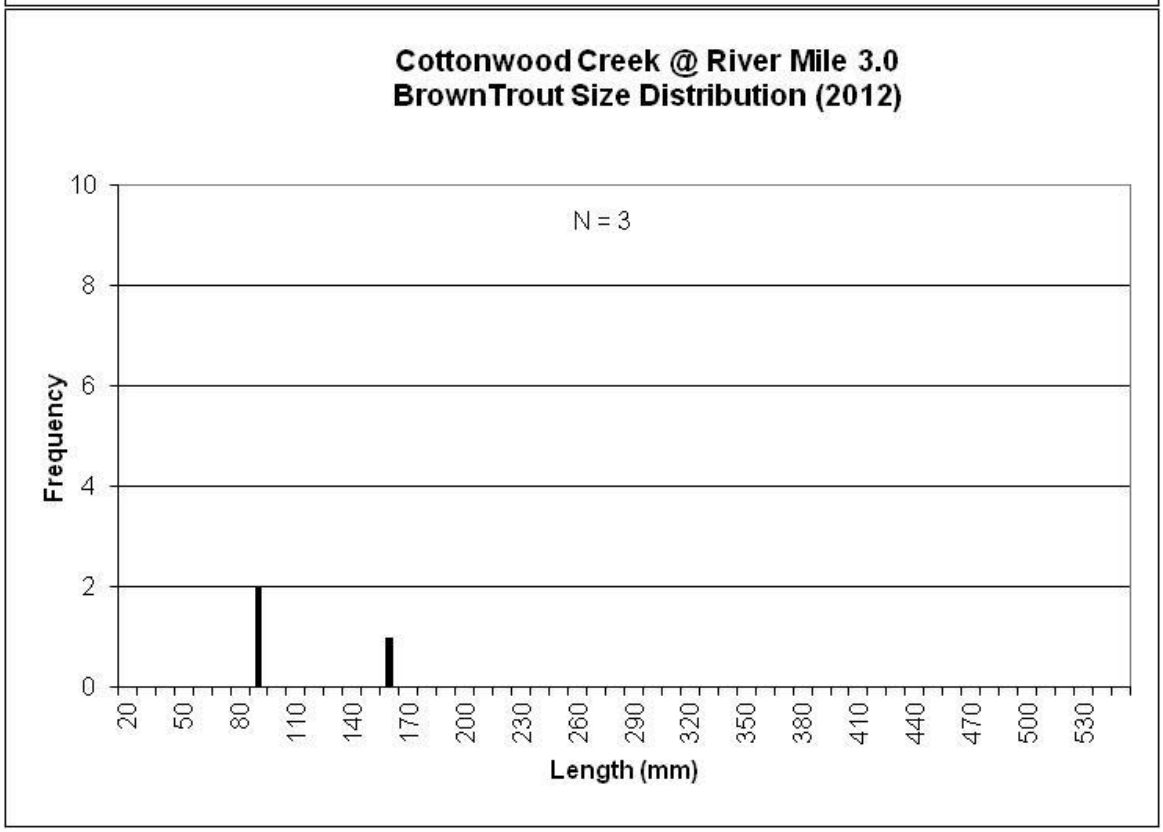

Freezeout Creek @ River Mile 2.9
BrookTrout Size Distribution (2012)
N = 44
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

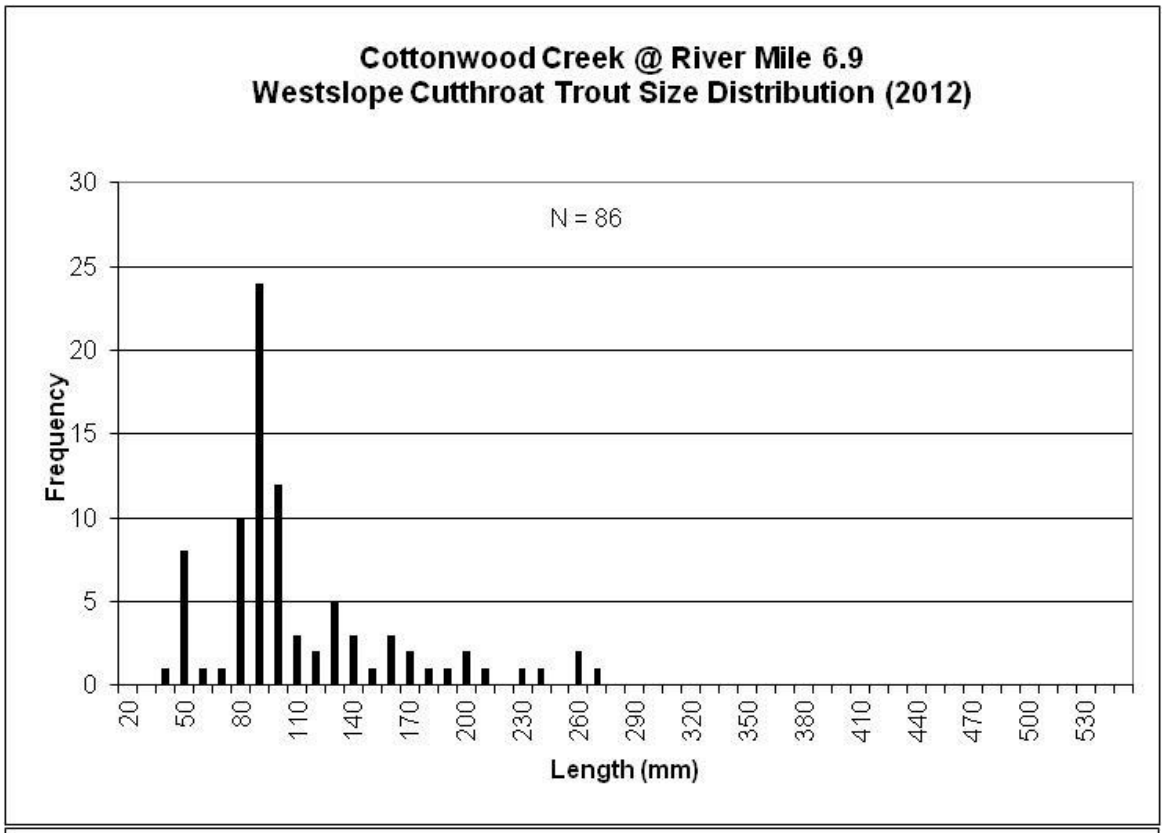

Jake Creek @ River Mile 4.1
Westslope Cutthroat Trout Size Distribution (2012)
N = 26
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

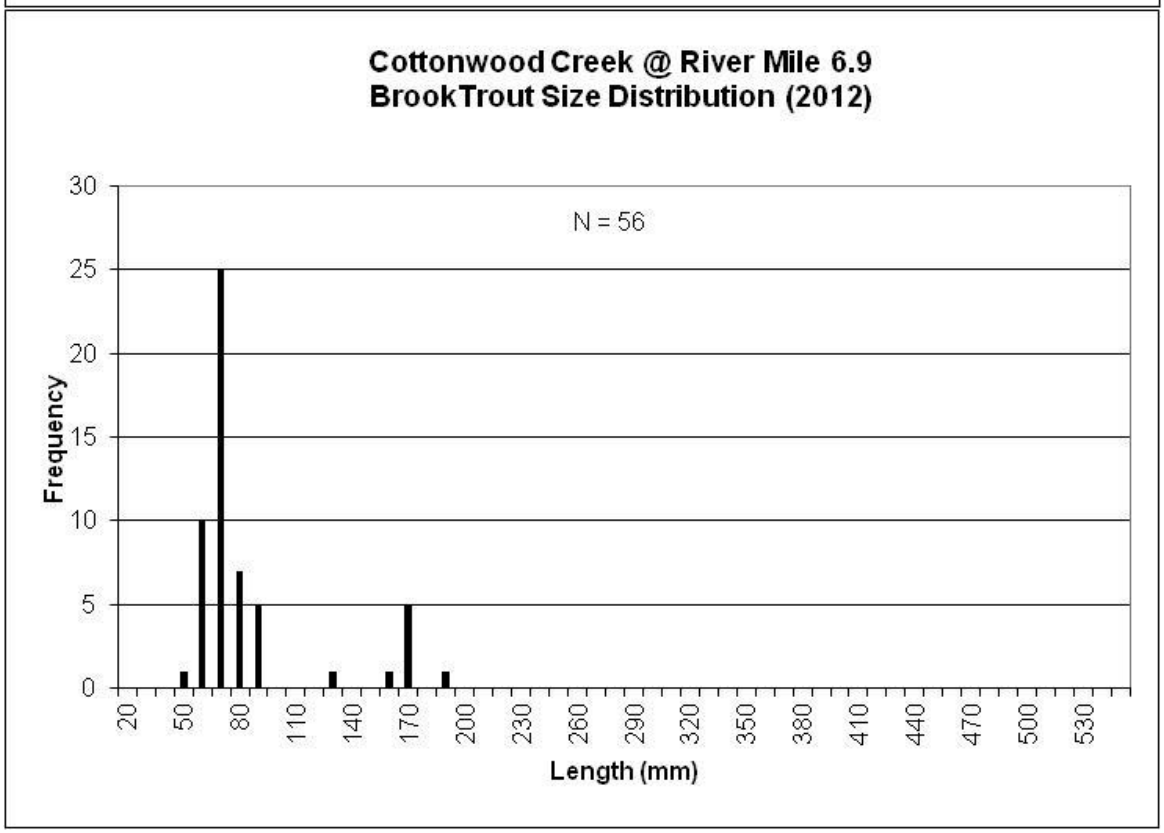

Fred Burr Creek @ River Mile 6.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 39
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

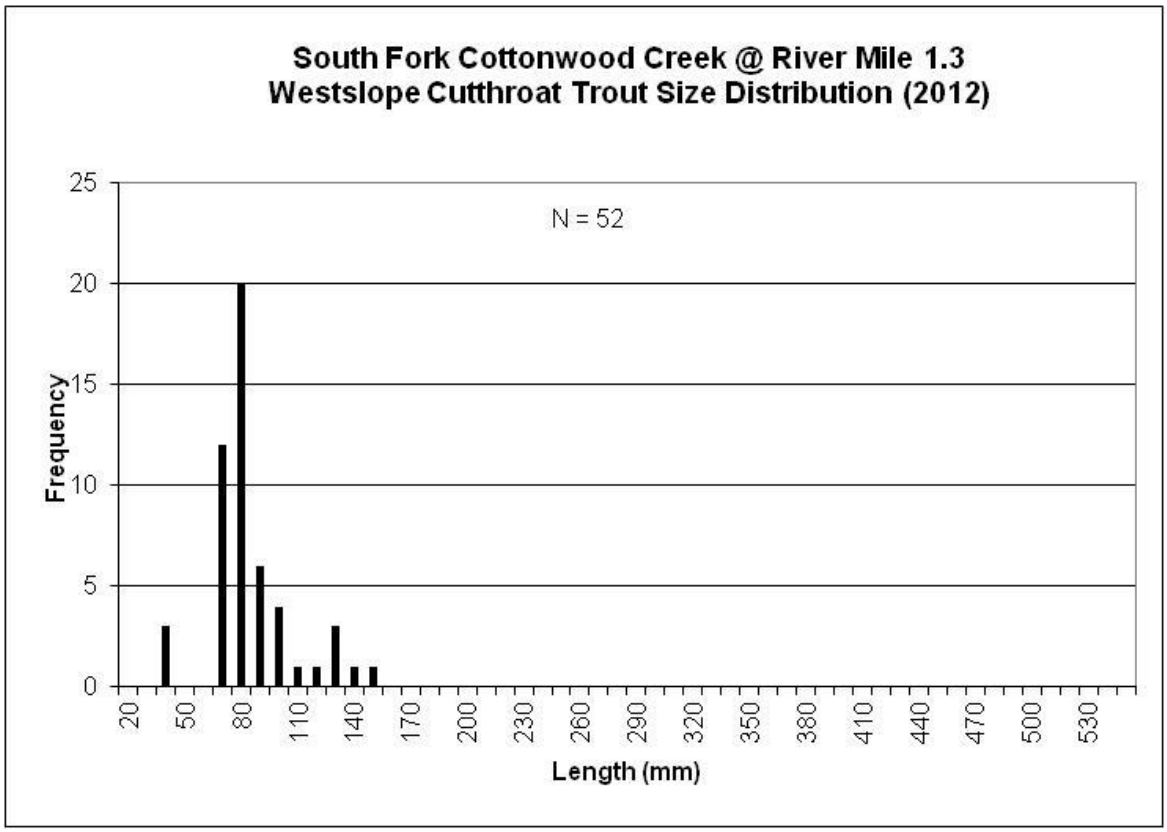

Fred Burr Creek @ River Mile 6.5
BrookTrout Size Distribution (2012)
N = 31
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

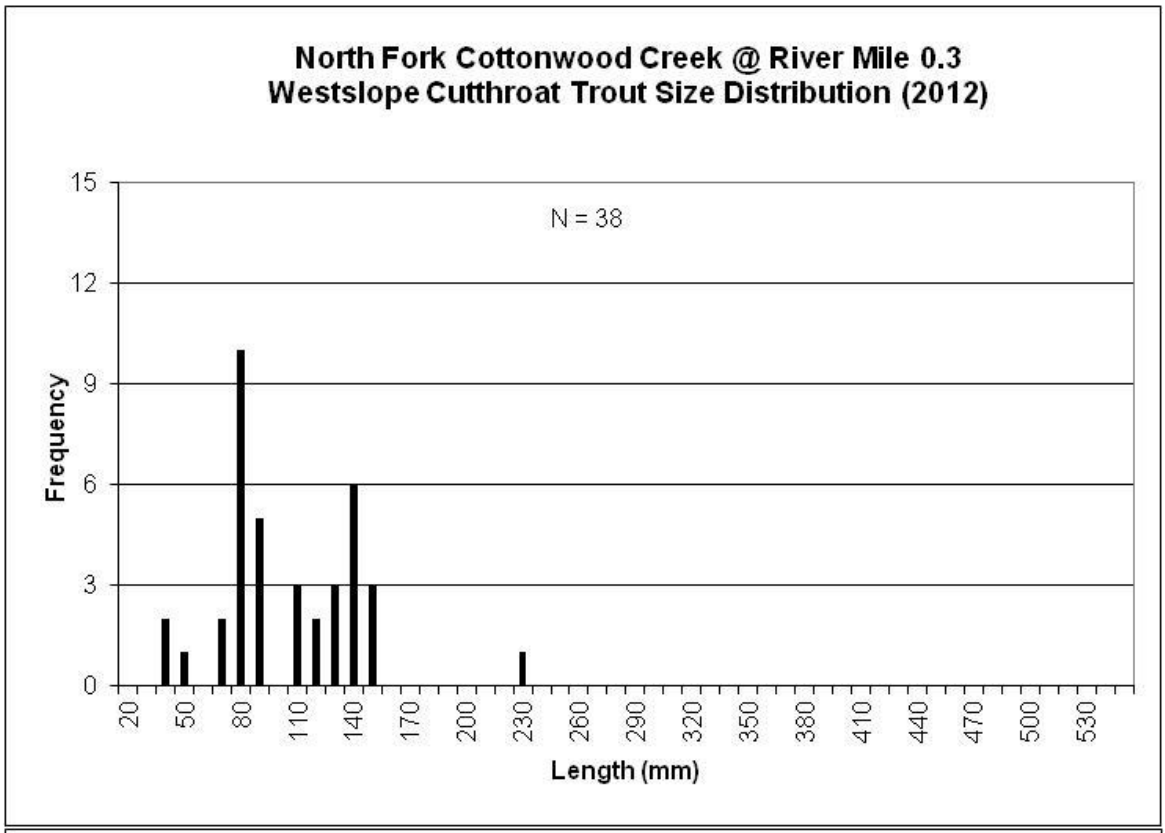

Cottonwood Creek @ River Mile 3.0
Brook Trout Size Distribution (2012)
N = 23
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

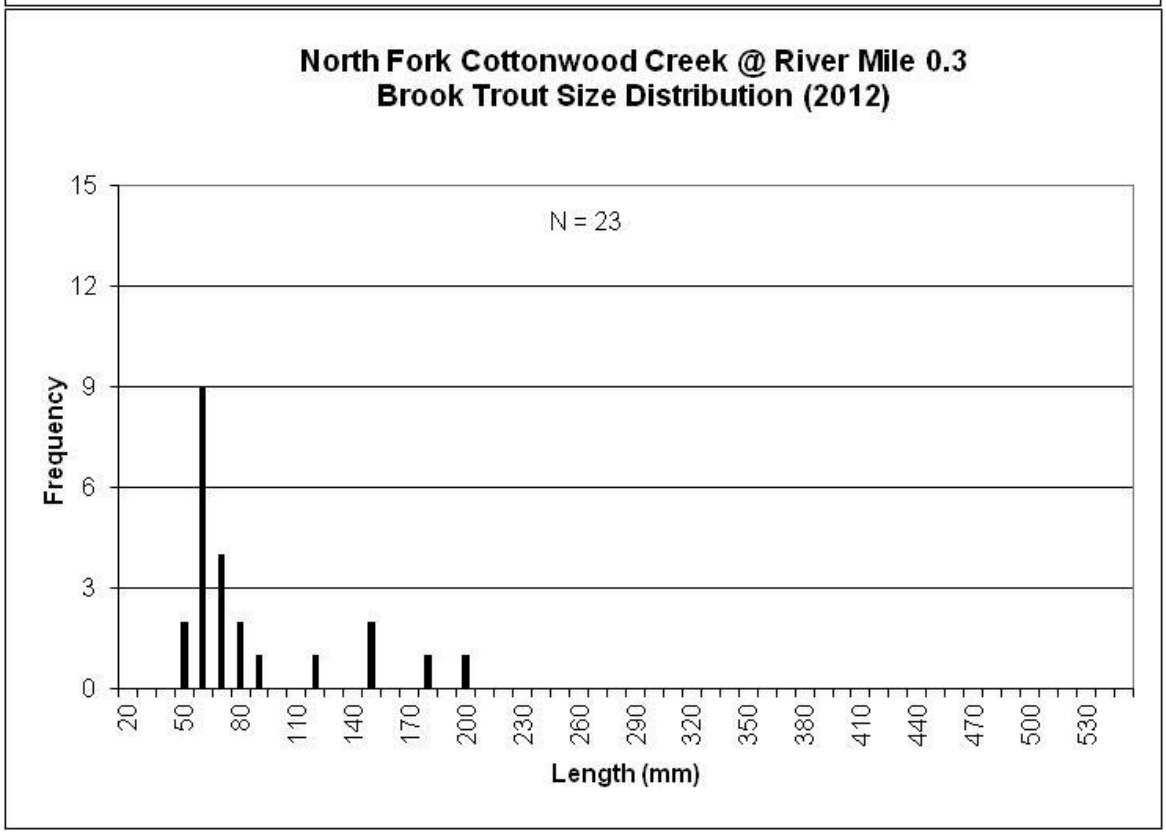

Cottonwood Creek @ River Mile 3.0
Brown Trout Size Distribution (2012)
N = 3
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

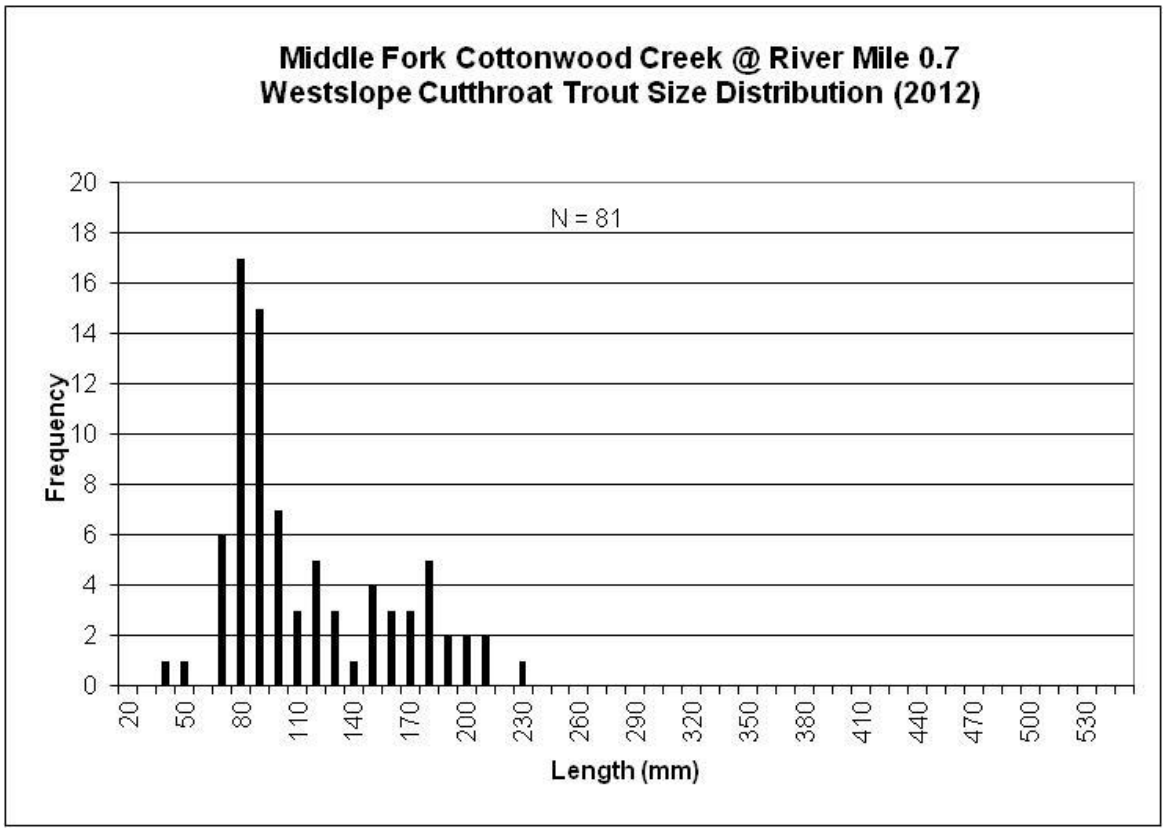

Cottonwood Creek @ River Mile 6.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 86
Frequency
Length (mm)
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

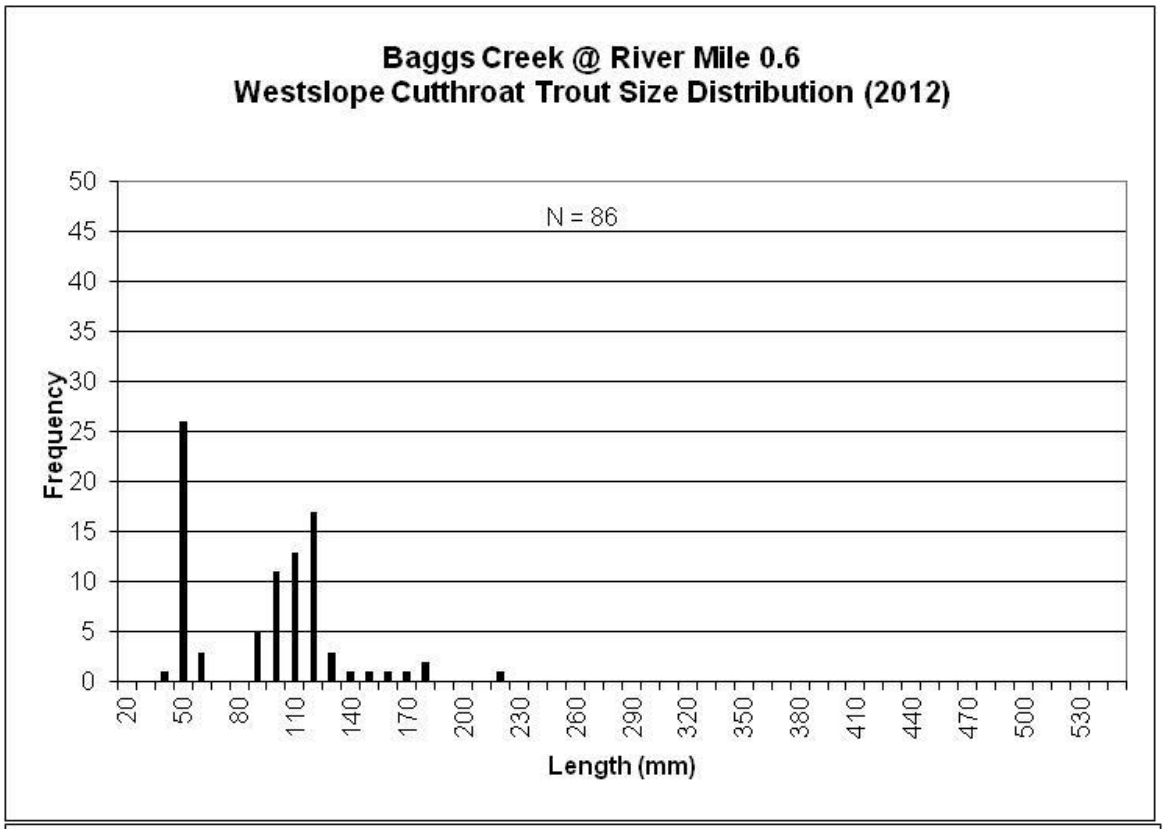

Cottonwood Creek @ River Mile 6.9
BrookTrout Size Distribution (2012)
N = 56
Frequency
Length (mm)
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

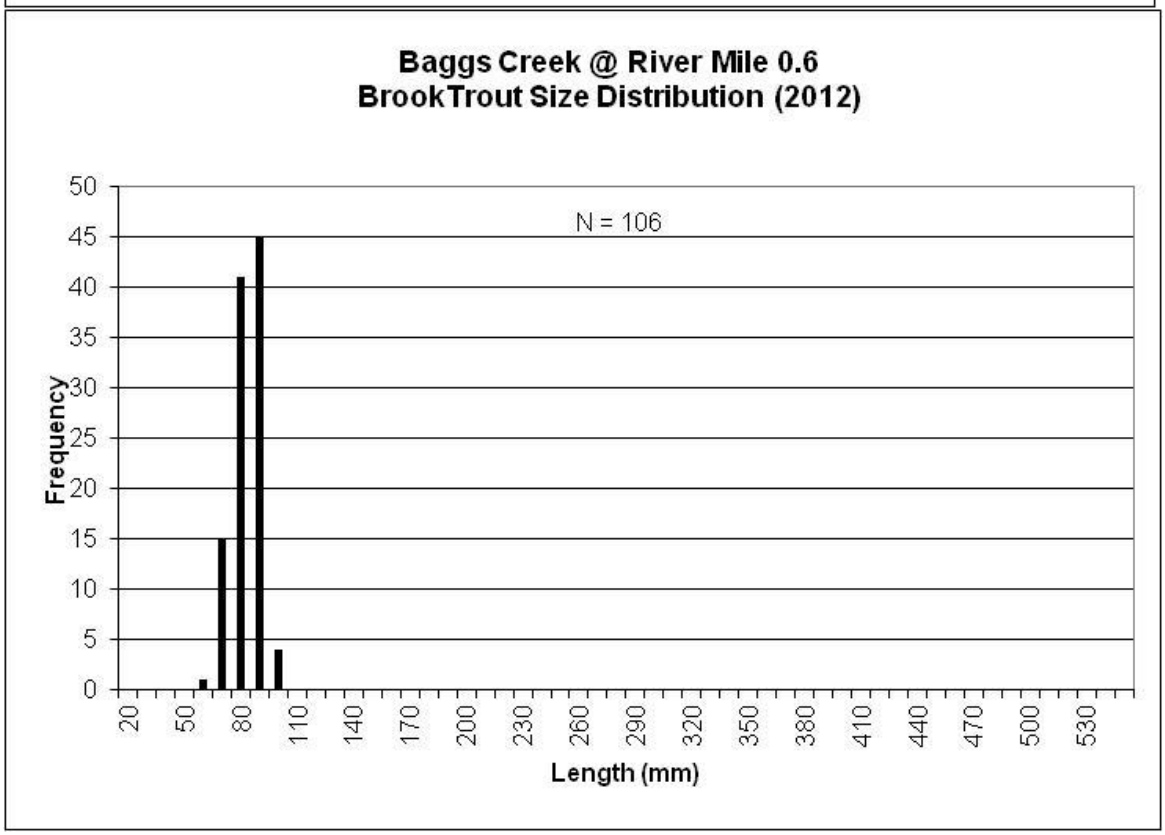

South Fork Cottonwood Creek @ River Mile 1.3
Westslope Cutthroat Trout Size Distribution (2012)
N = 52
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

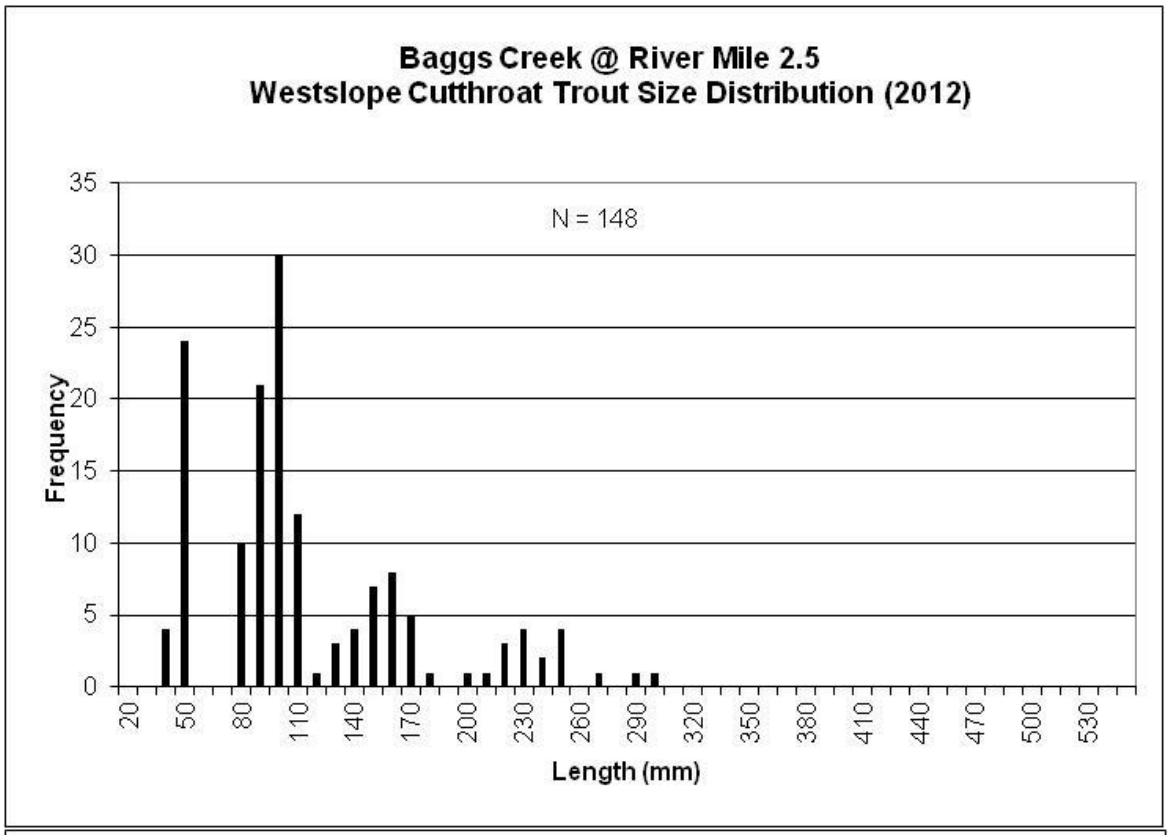

North Fork Cottonwood Creek @ River Mile 0.3
Westslope Cutthroat Trout Size Distribution (2012)
N = 38
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

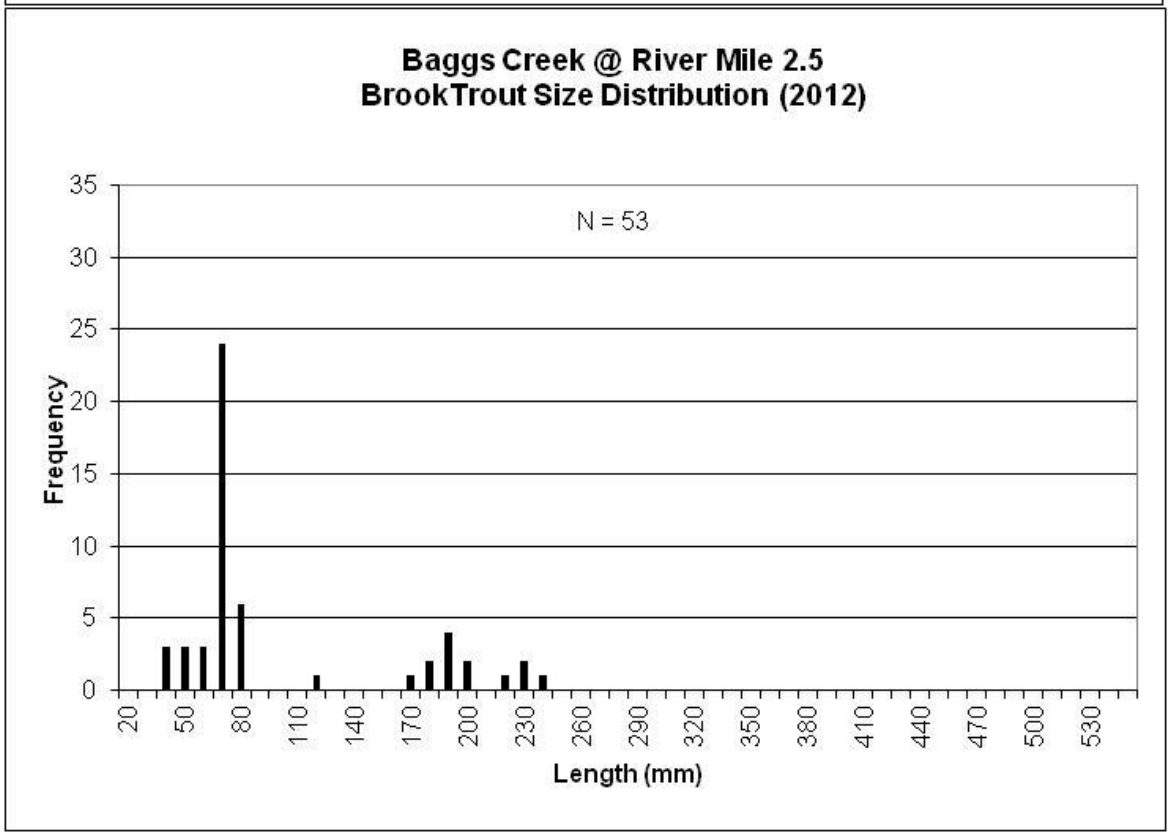

North Fork Cottonwood Creek @ River Mile 0.3
Brook Trout Size Distribution (2012)
N = 23
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

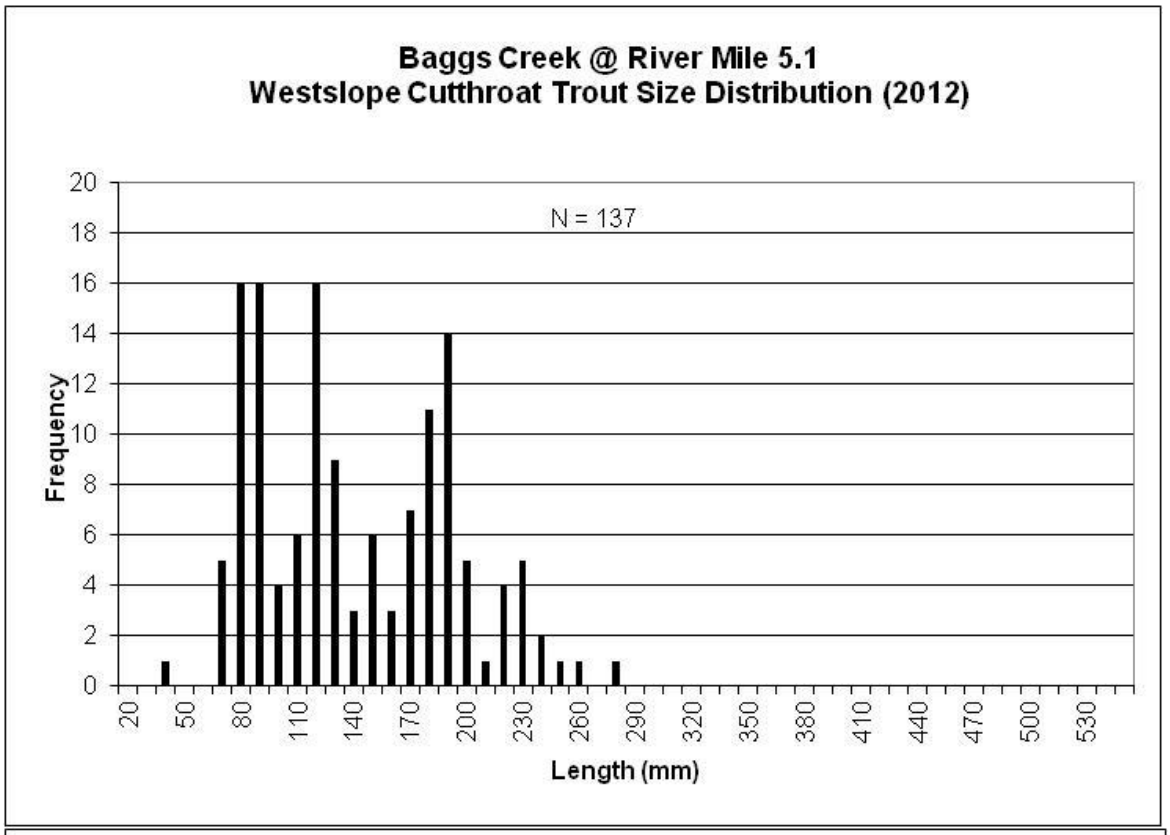

Middle Fork Cottonwood Creek @ River Mile 0.7
Westslope Cutthroat Trout Size Distribution (2012)
N = 81
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

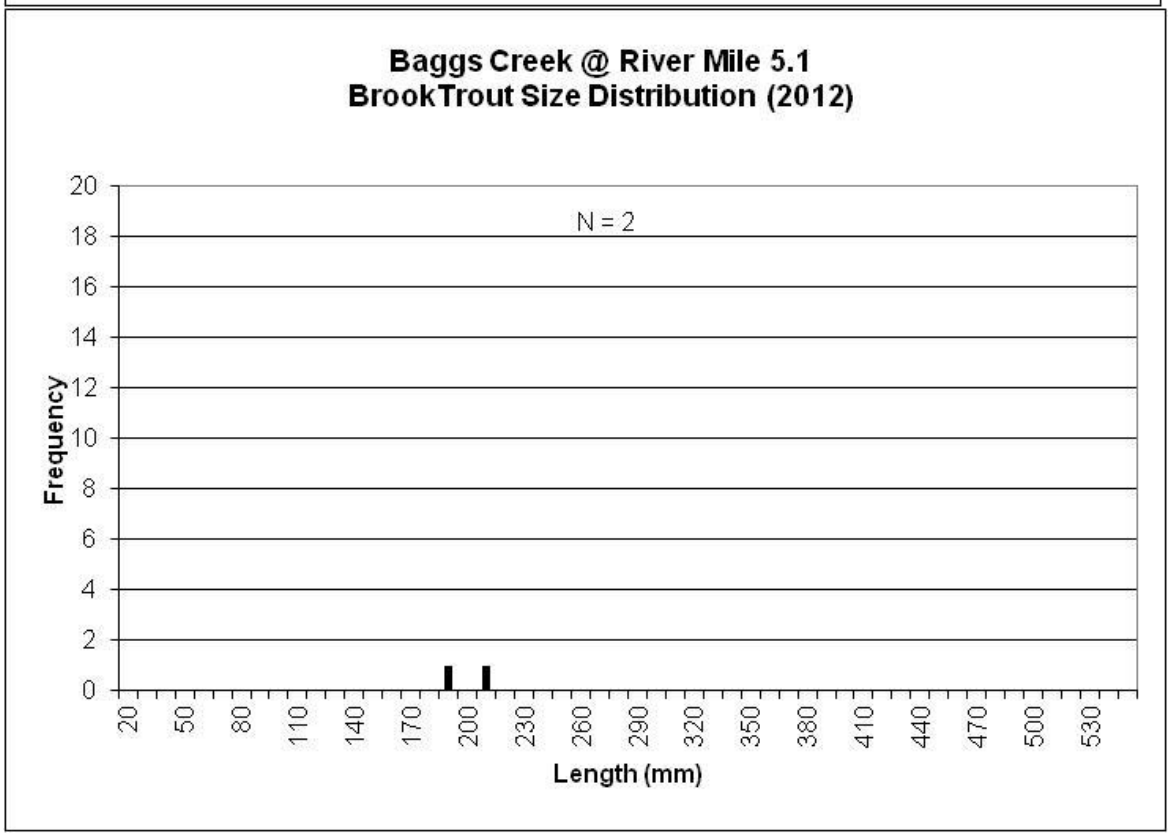

Baggs Creek @ River Mile 0.6
Westslope Cutthroat Trout Size Distribution (2012)
N = 86
Frequency
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

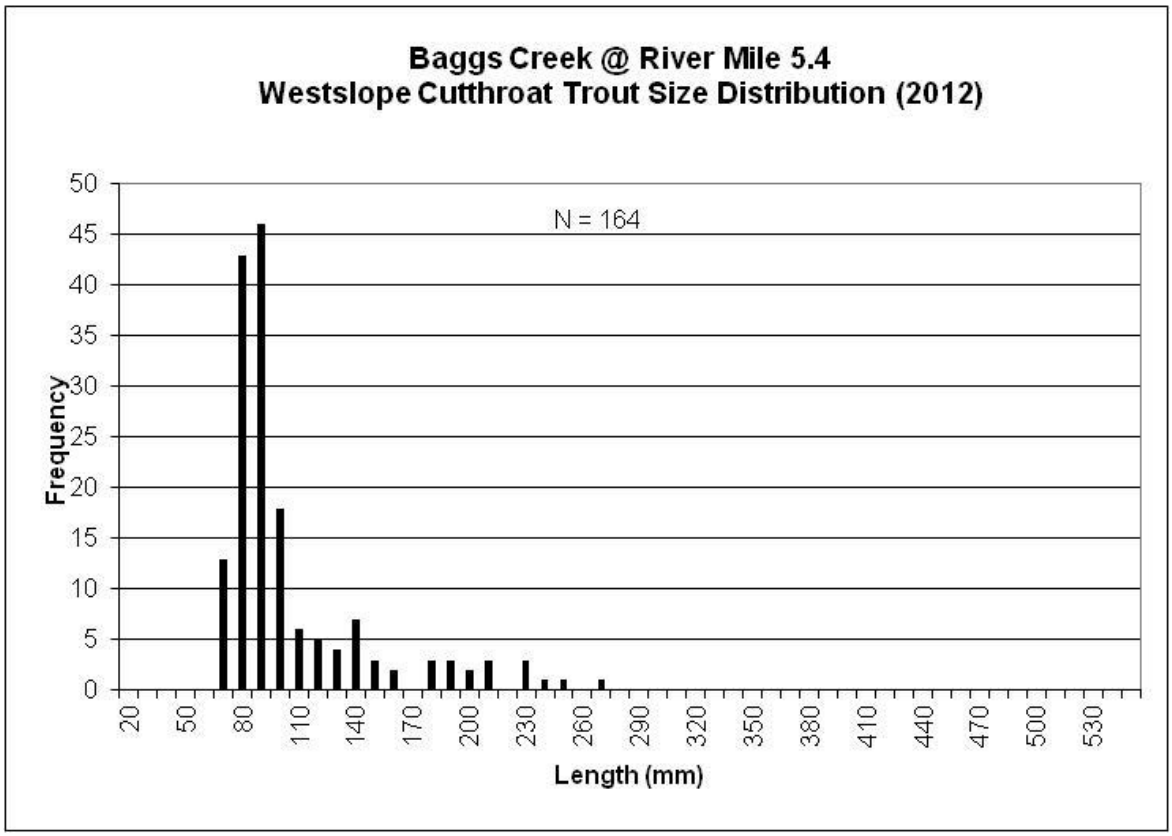

Baggs Creek @ River Mile 0.6
BrookTrout Size Distribution (2012)
N = 106
Frequency
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

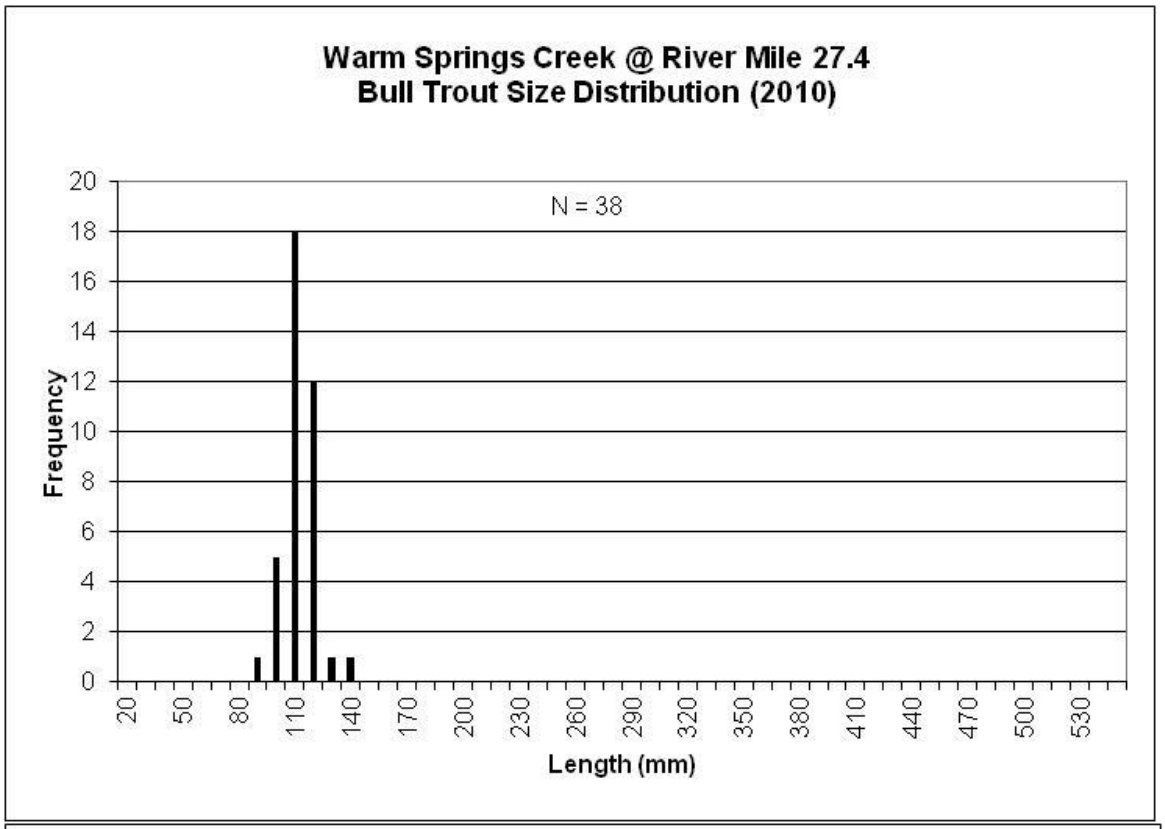

Baggs Creek @ River Mile 2.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 148
Frequency
Length (mm)
0
5
10
15
20
25
30
35
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

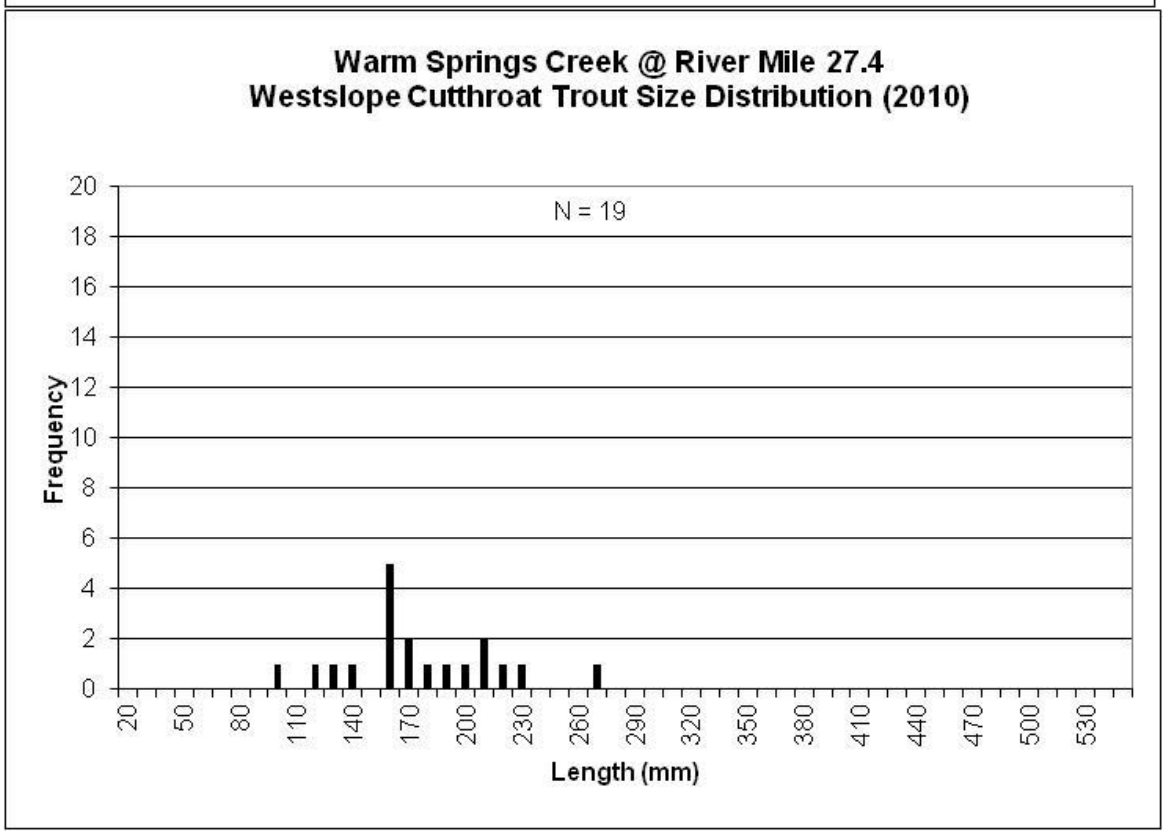

Baggs Creek @ River Mile 2.5
BrookTrout Size Distribution (2012)
N = 53
Frequency
Length (mm)
0
5
10
15
20
25
30
35
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

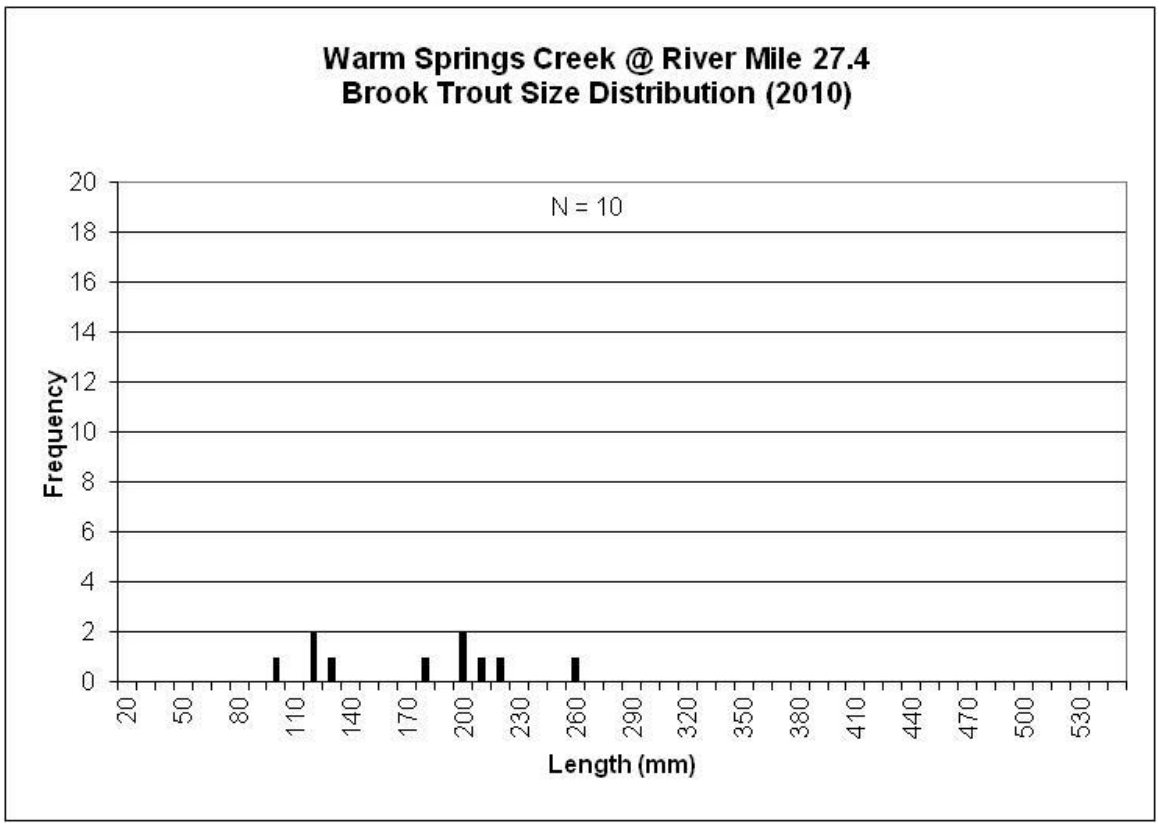

Baggs Creek @ River Mile 5.1
Westslope Cutthroat Trout Size Distribution (2012)
N = 137
Frequency
Length (mm)
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

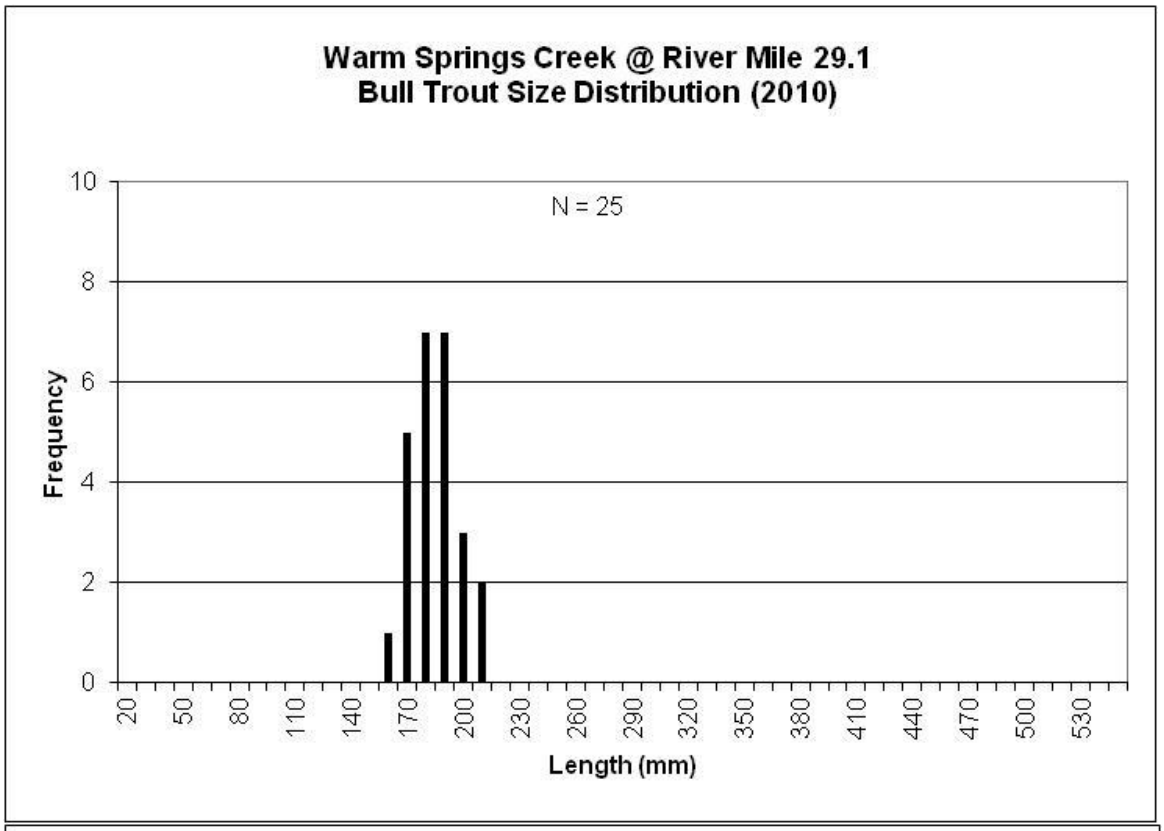

Baggs Creek @ River Mile 5.1
BrookTrout Size Distribution (2012)
N = 2
Frequency
Length (mm)
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

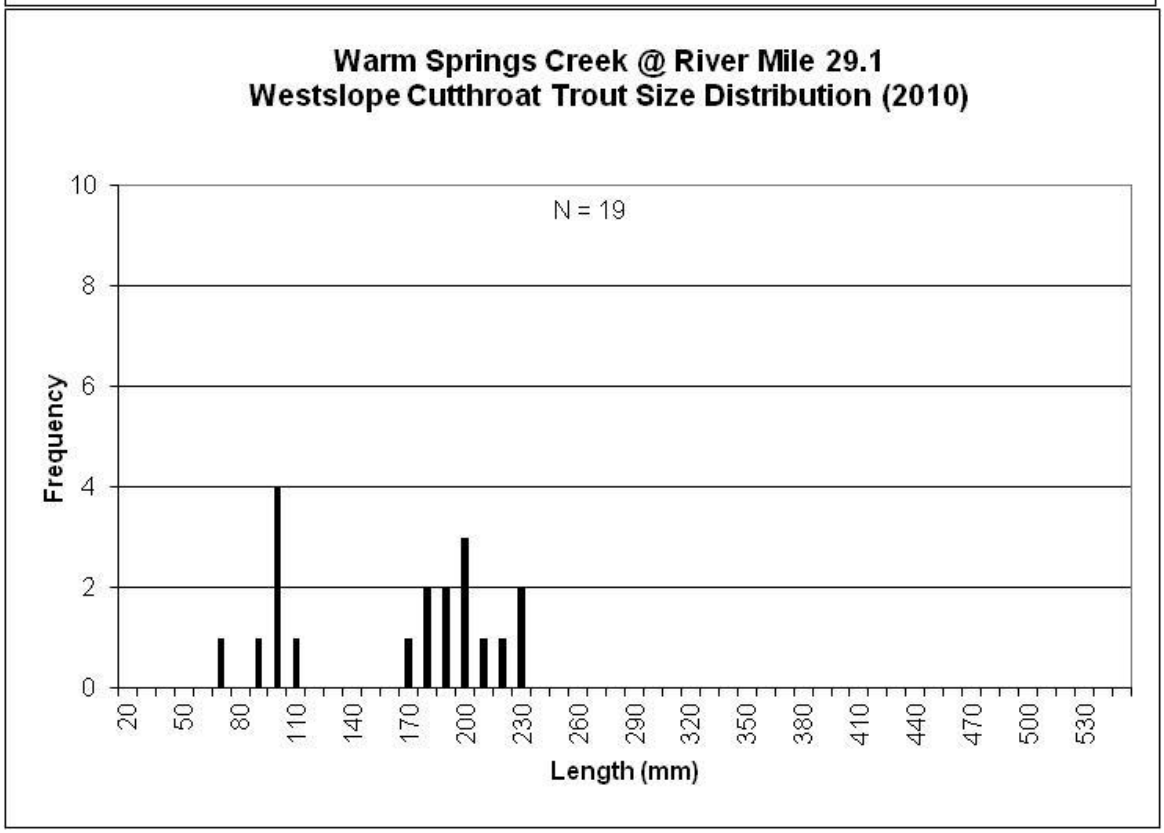

Baggs Creek @ River Mile 5.4
Westslope Cutthroat Trout Size Distribution (2012)
N = 164
Frequency
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

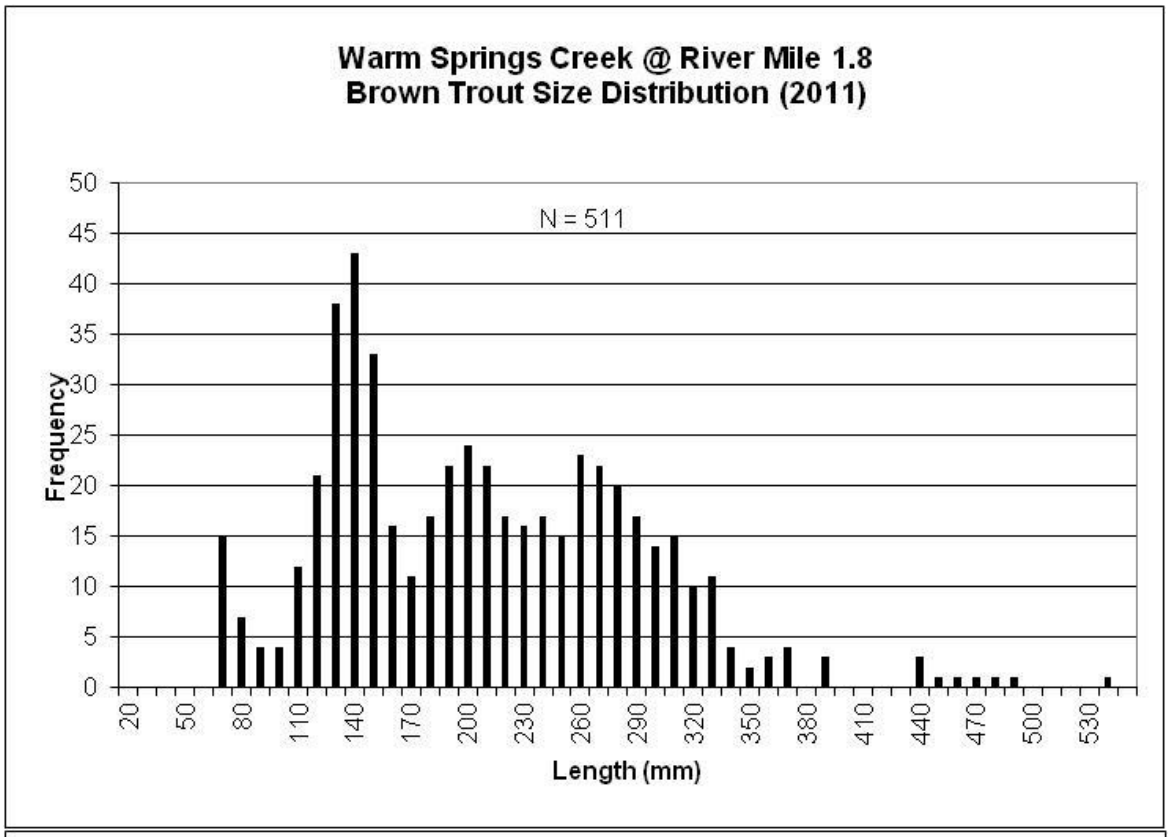

Warm Springs Creek @ River Mile 27.4
Bull Trout Size Distribution (2010)
N = 38
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

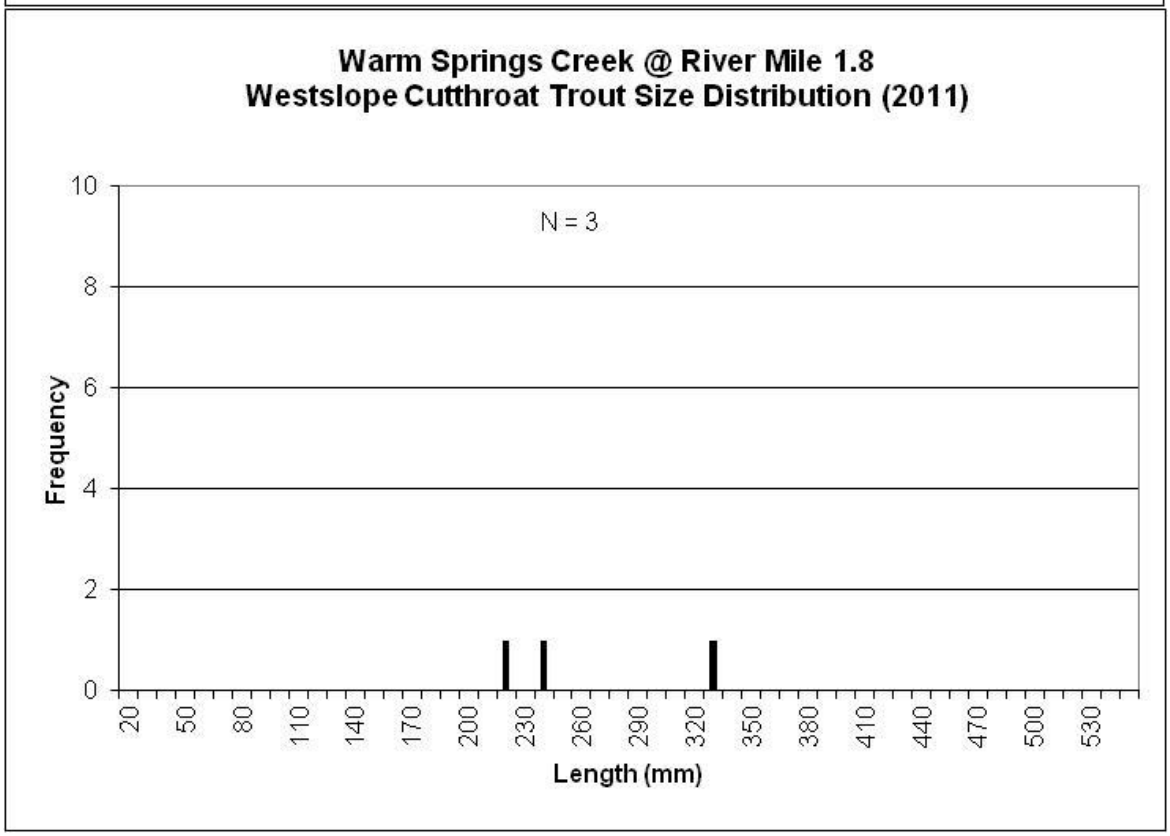

Warm Springs Creek @ River Mile 27.4
Westslope Cutthroat Trout Size Distribution (2010)
N = 19
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

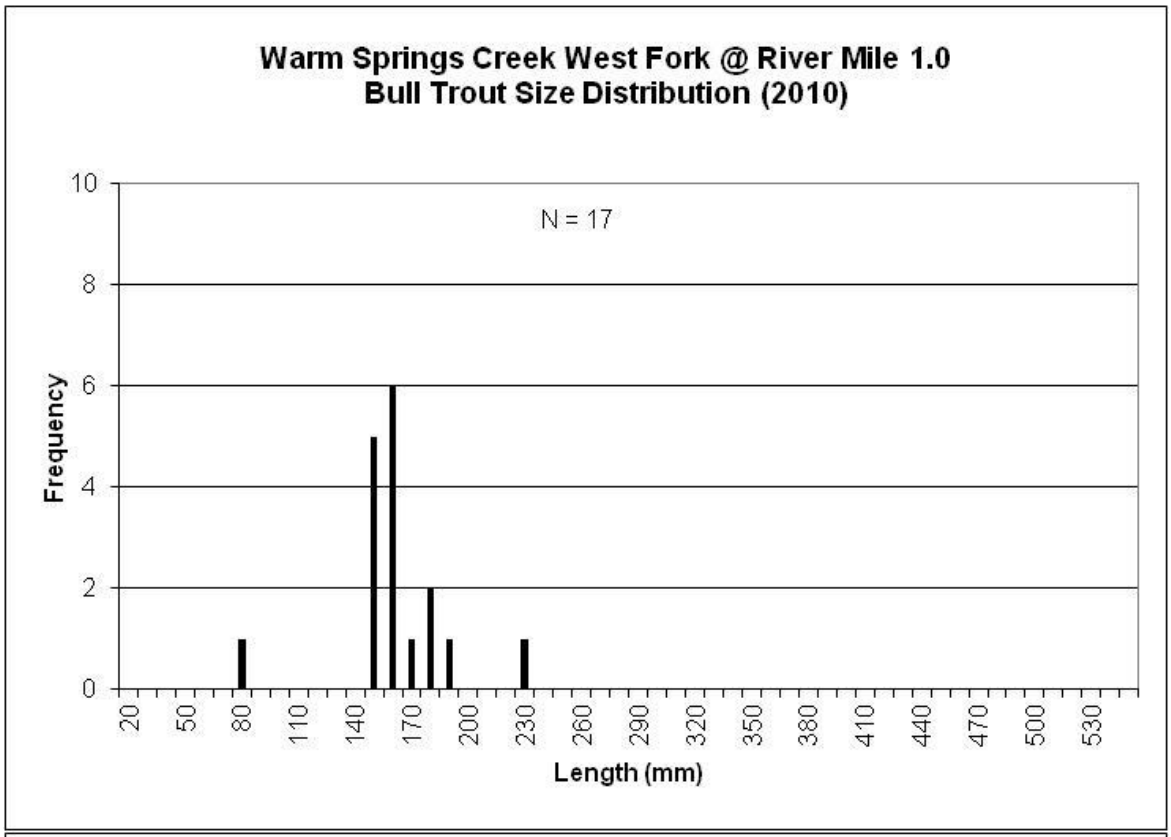

Warm Springs Creek @ River Mile 27.4
Brook Trout Size Distribution (2010)
N = 10
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

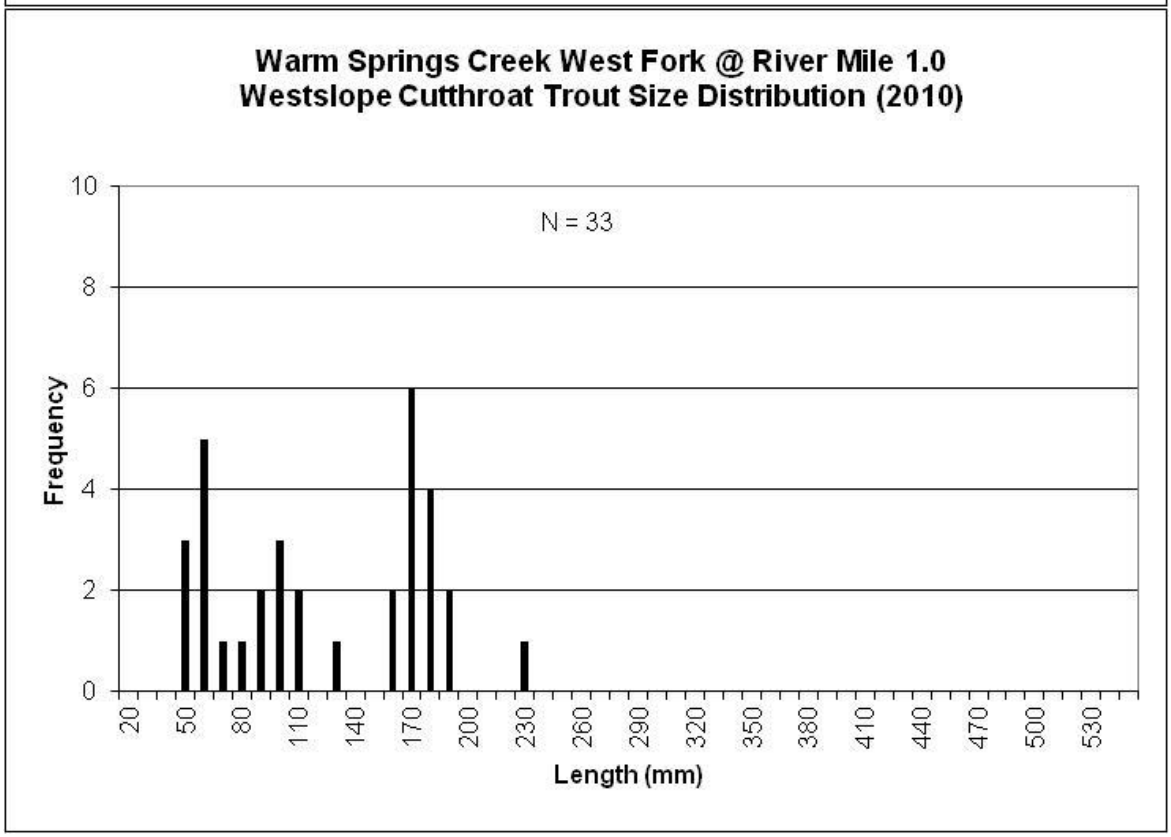

Warm Springs Creek @ River Mile 29.1
Bull Trout Size Distribution (2010)
N = 25
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

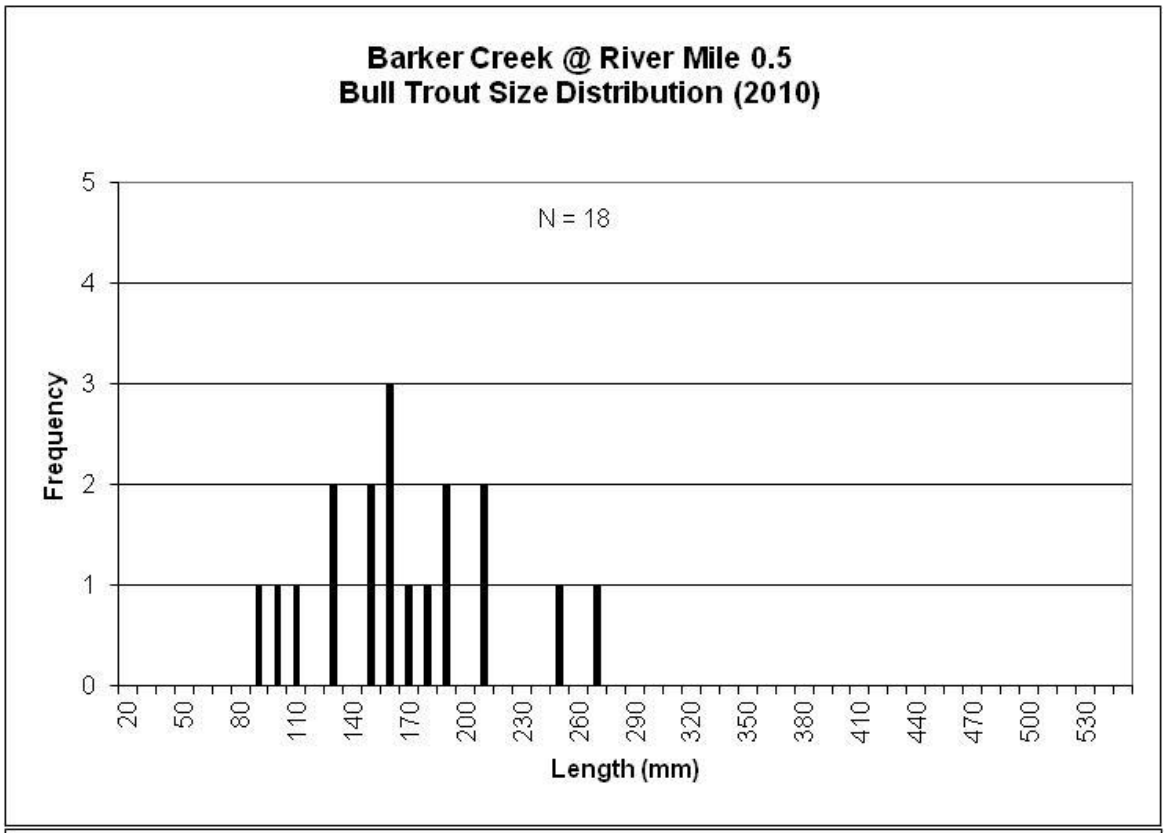

Warm Springs Creek @ River Mile 29.1
Westslope Cutthroat Trout Size Distribution (2010)
N = 19
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

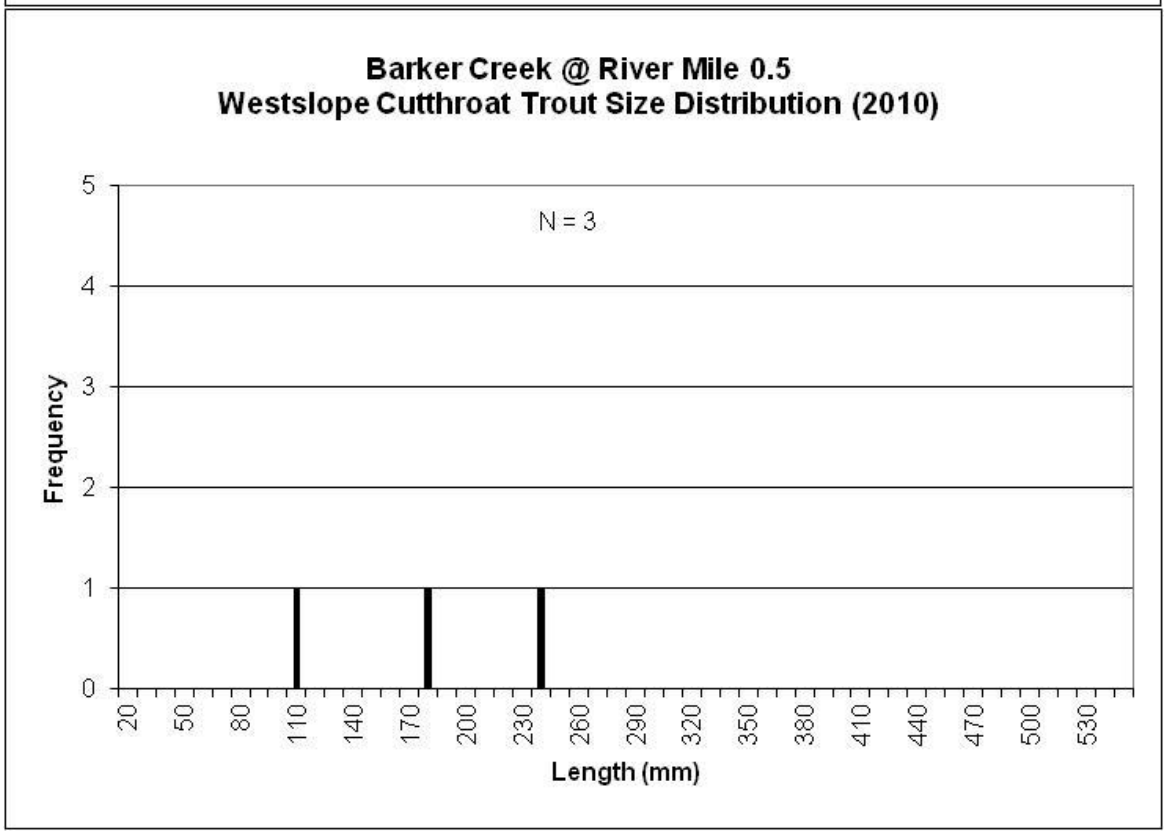

Warm Springs Creek @ River Mile 1.8
Brown Trout Size Distribution (2011)
N = 511
Frequency
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

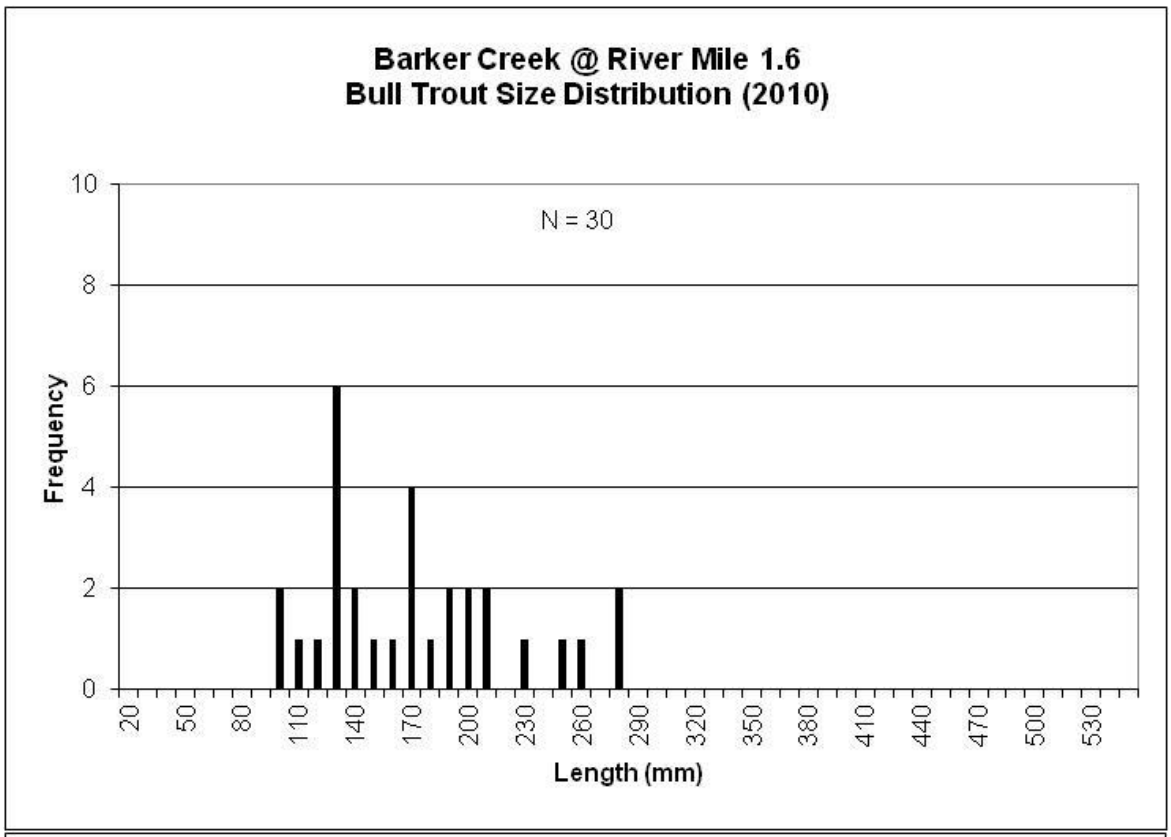

Warm Springs Creek @ River Mile 1.8
Westslope Cutthroat Trout Size Distribution (2011)
N = 3
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

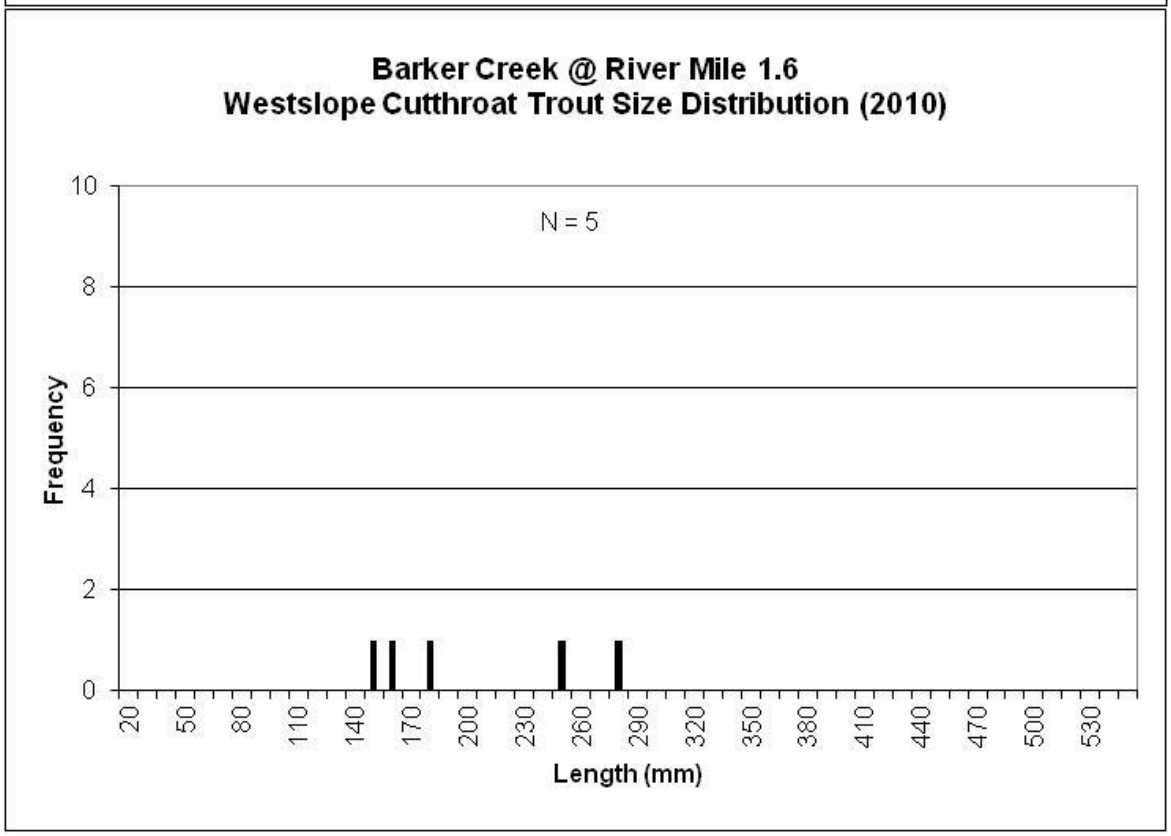

Warm Springs Creek West Fork @ River Mile 1.0
Bull Trout Size Distribution (2010)
N = 17
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

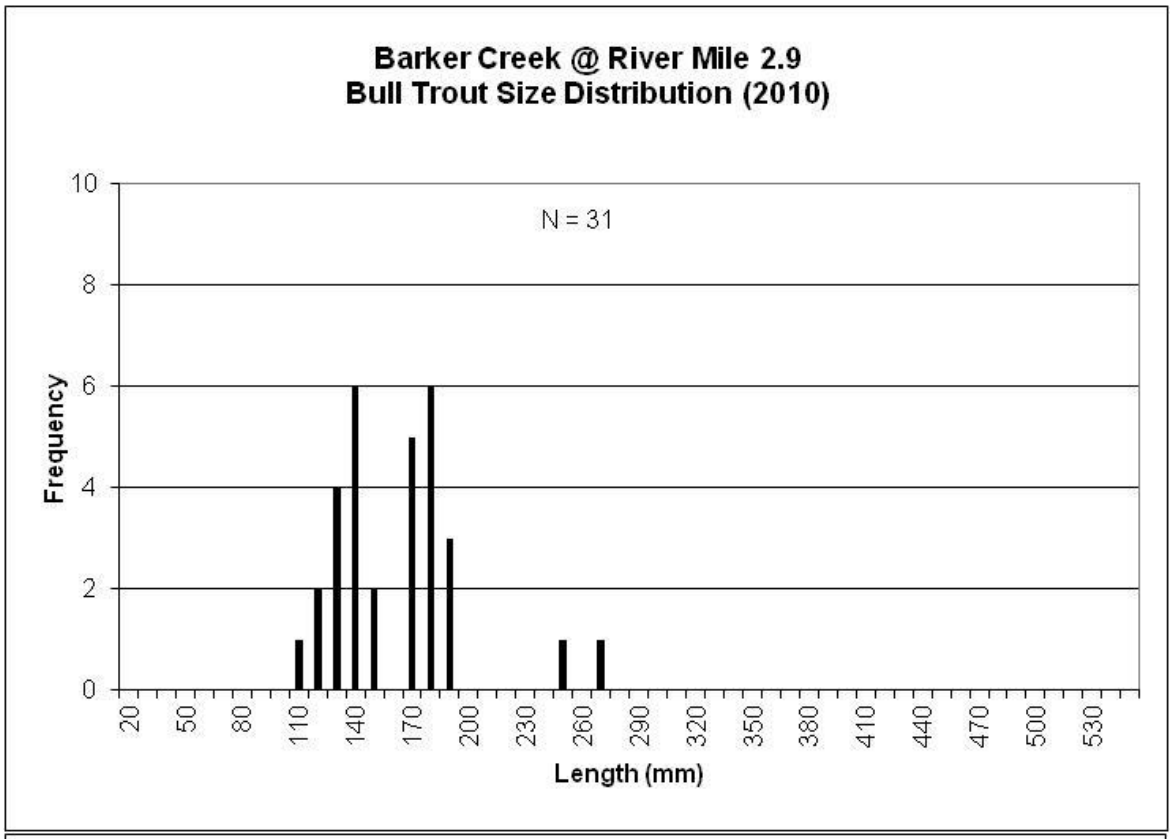

Warm Springs Creek West Fork @ River Mile 1.0
Westslope Cutthroat Trout Size Distribution (2010)
N = 33
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

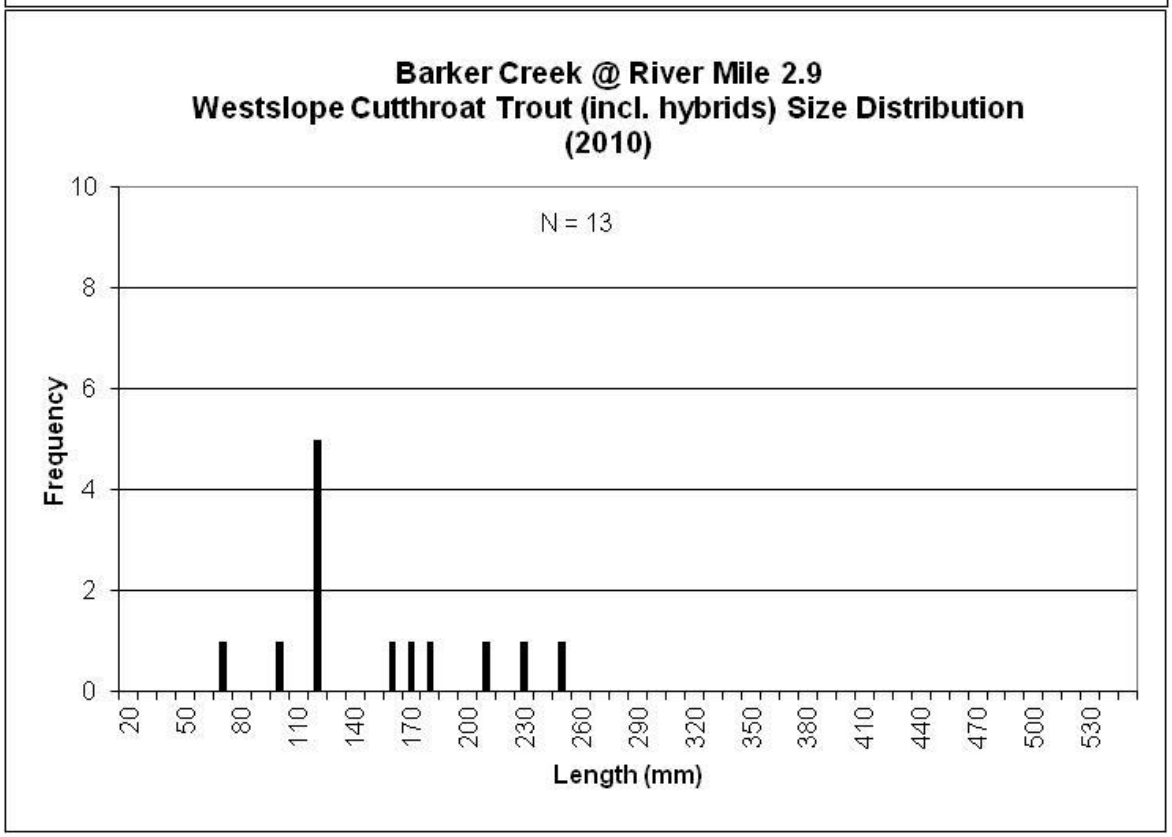

Barker Creek @ River Mile 0.5
Bull Trout Size Distribution (2010)
N = 18
Frequency
0
1
2
3
4
5
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

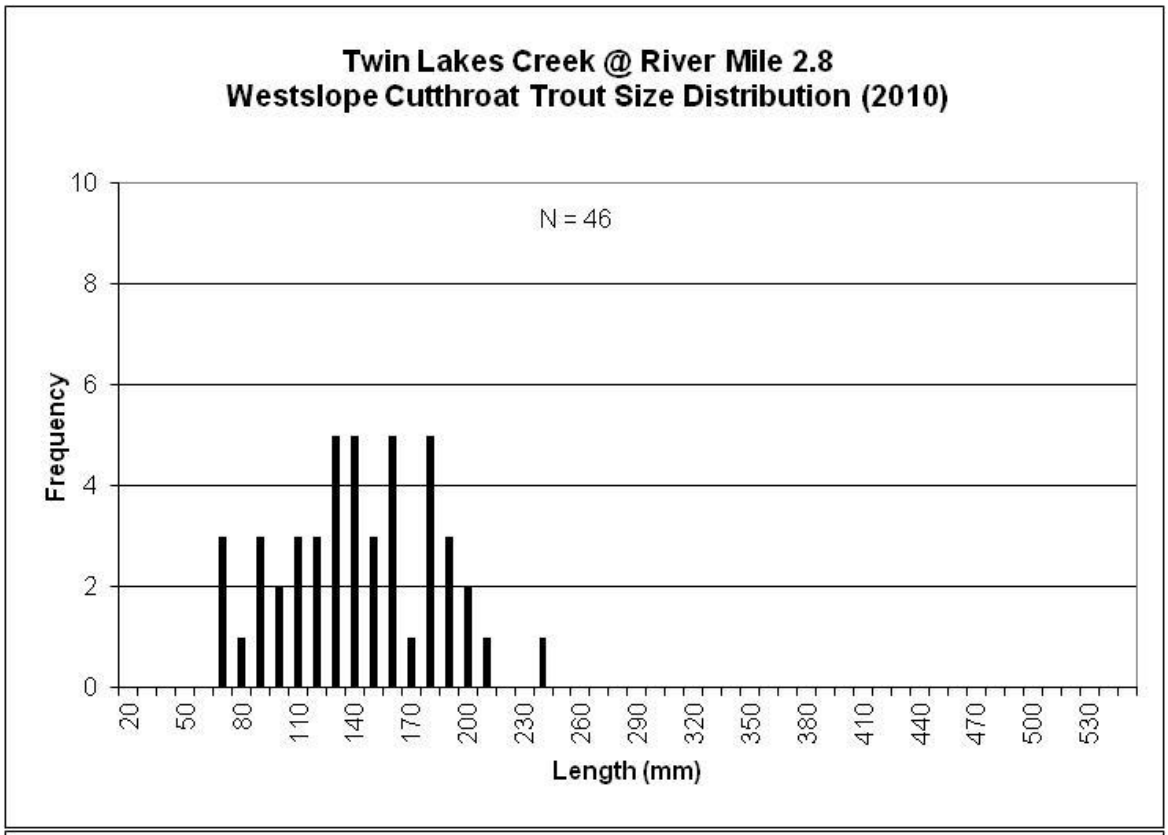

Barker Creek @ River Mile 0.5
Westslope Cutthroat Trout Size Distribution (2010)
N = 3
Frequency
0
1
2
3
4
5
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

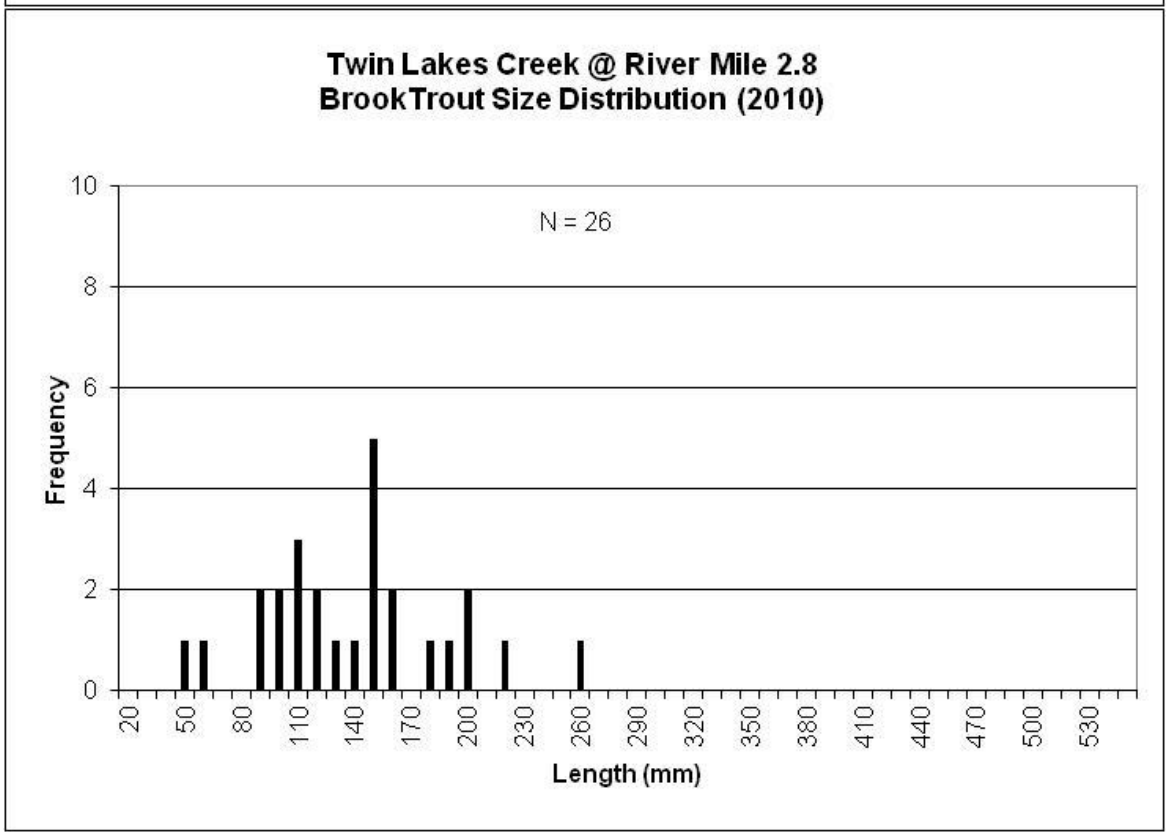

Barker Creek @ River Mile 1.6
Bull Trout Size Distribution (2010)
N = 30
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

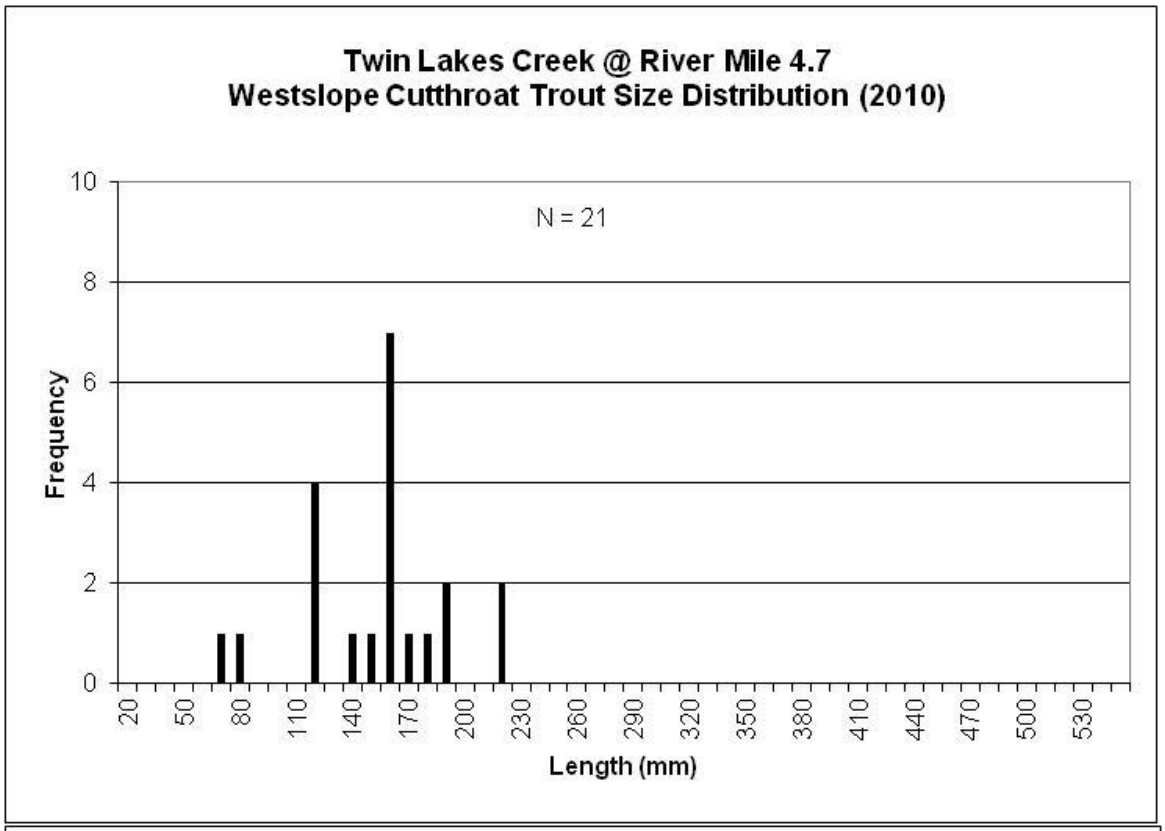

Barker Creek @ River Mile 1.6
Westslope Cutthroat Trout Size Distribution (2010)
N = 5
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

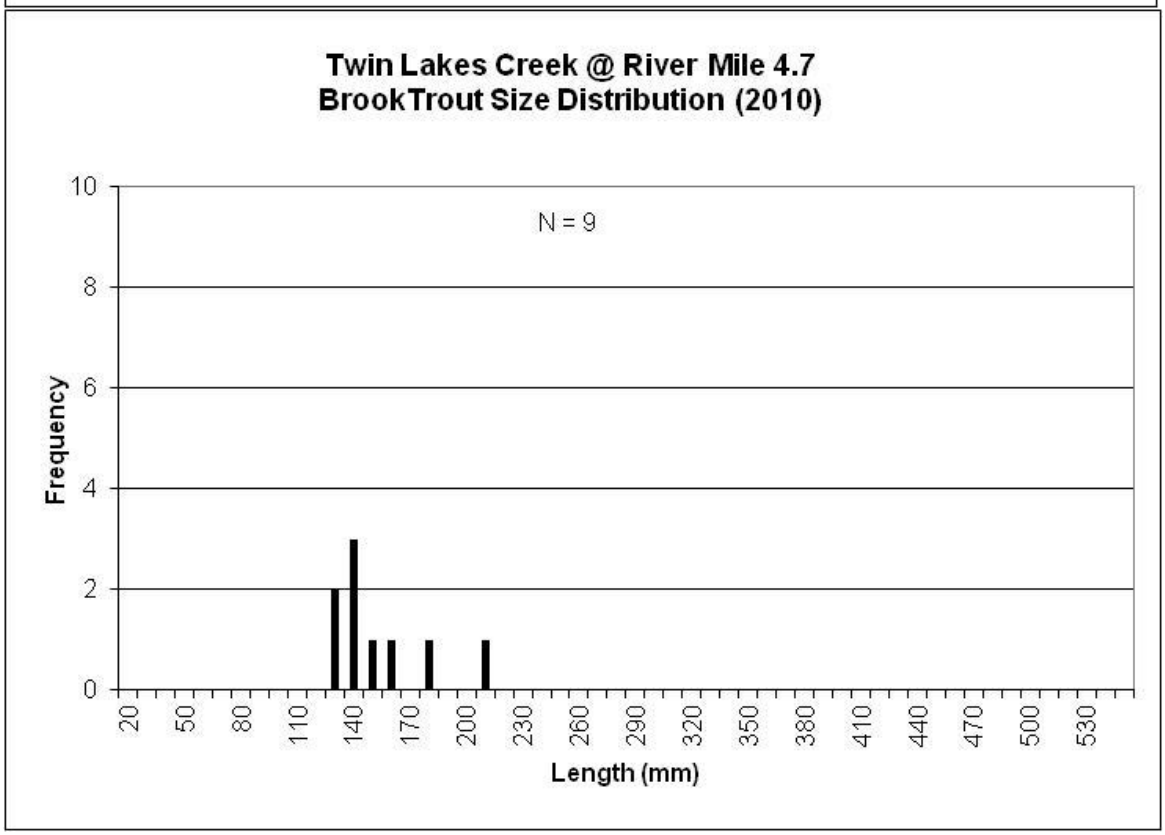

Barker Creek @ River Mile 2.9
Bull Trout Size Distribution (2010)
N = 31
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

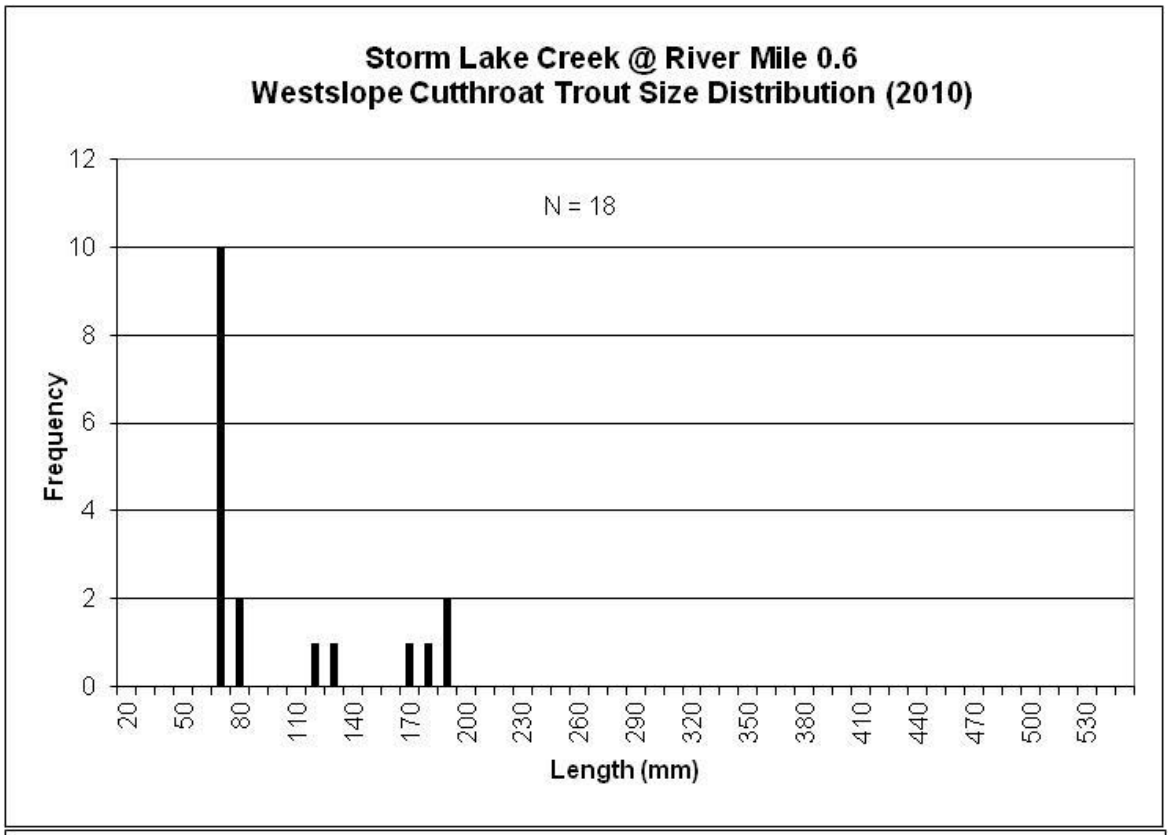

Barker Creek @ River Mile 2.9
Westslope Cutthroat Trout (incl. hybrids) Size Distribution
(2010)
N = 13
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

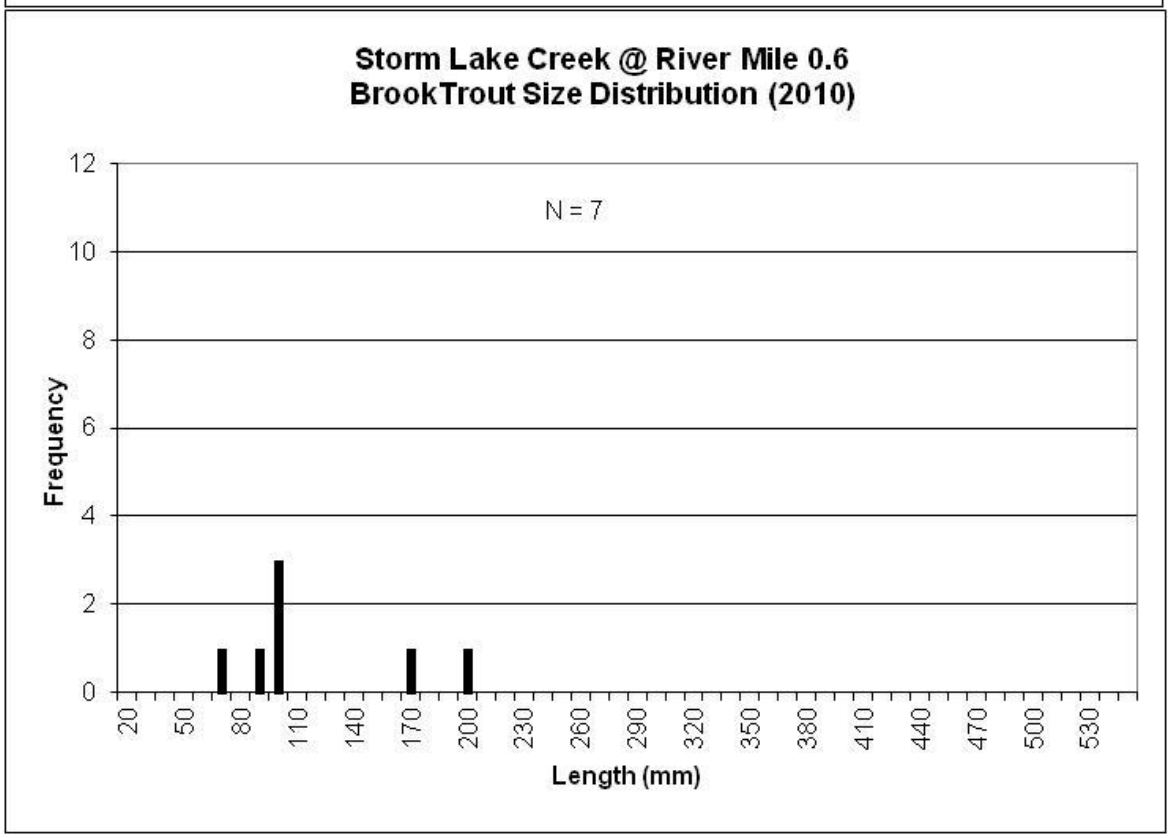

Twin Lakes Creek @ River Mile 2.8
Westslope Cutthroat Trout Size Distribution (2010)
N = 46
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

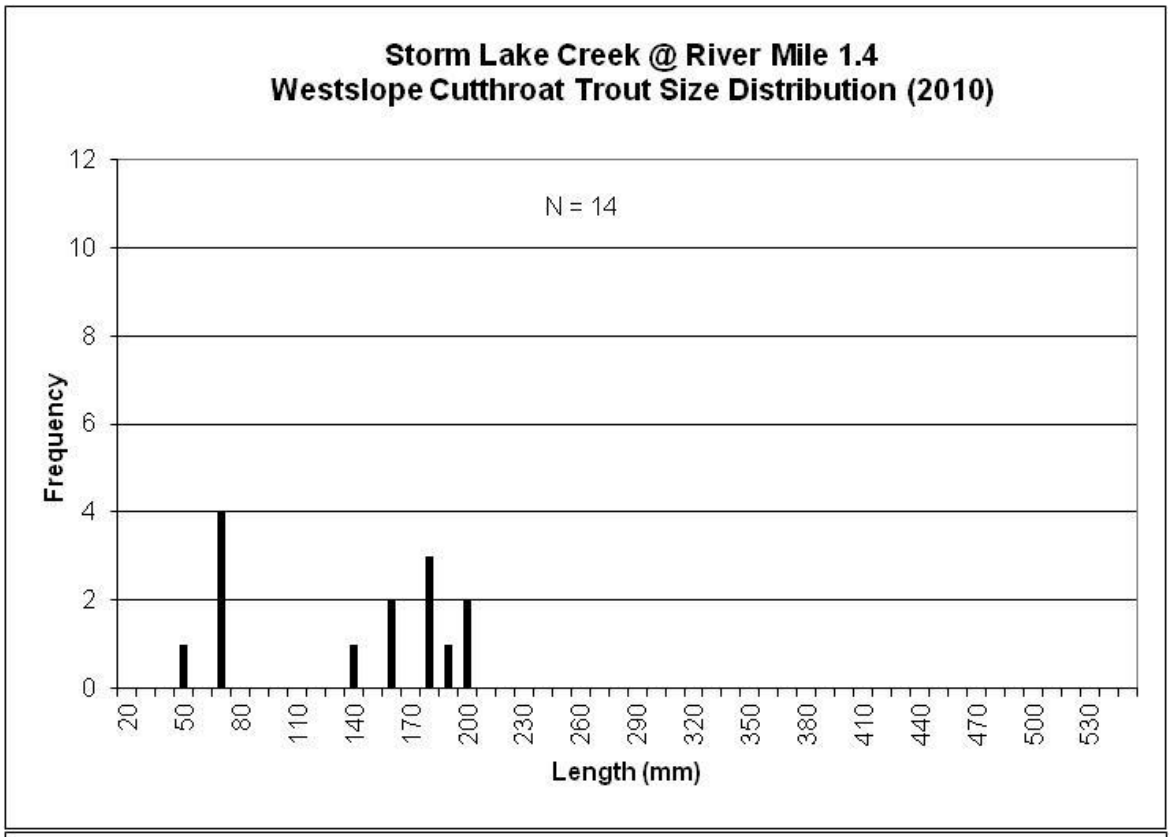

Twin Lakes Creek @ River Mile 2.8
BrookTrout Size Distribution (2010)
N = 26
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

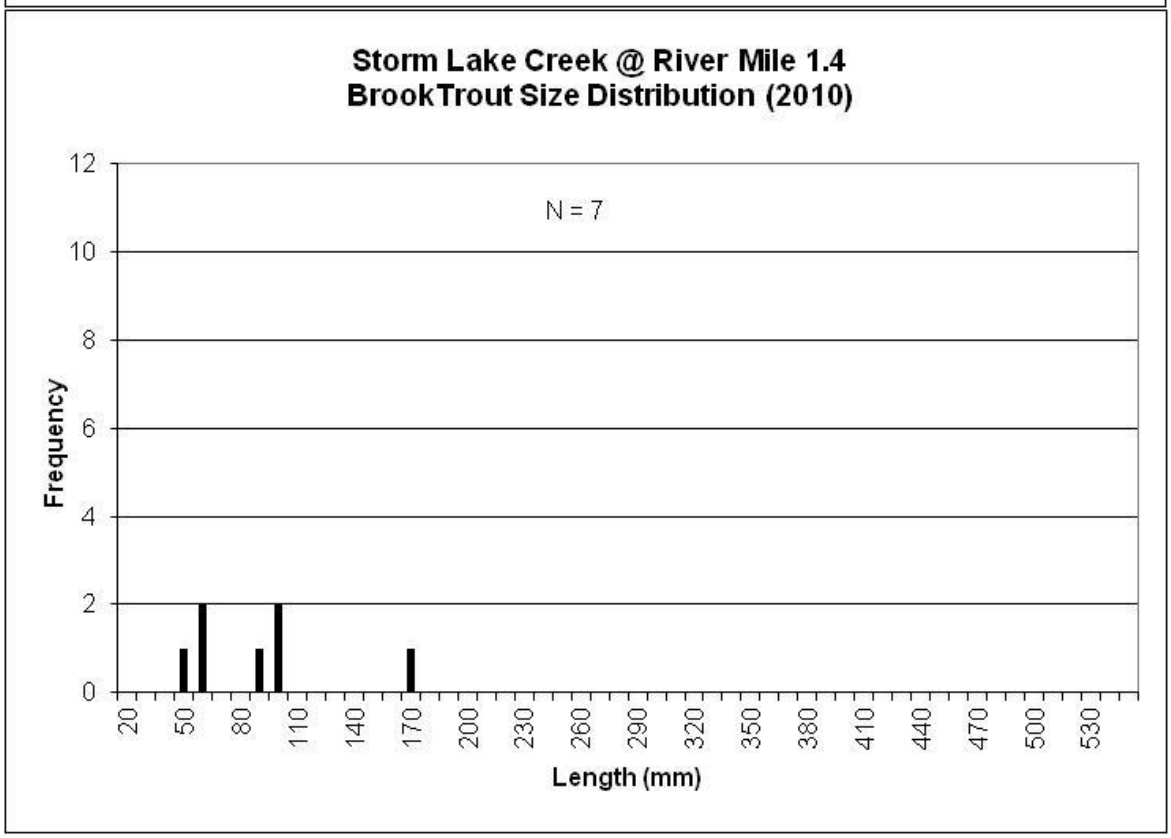

Twin Lakes Creek @ River Mile 4.7
Westslope Cutthroat Trout Size Distribution (2010)
N = 21
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

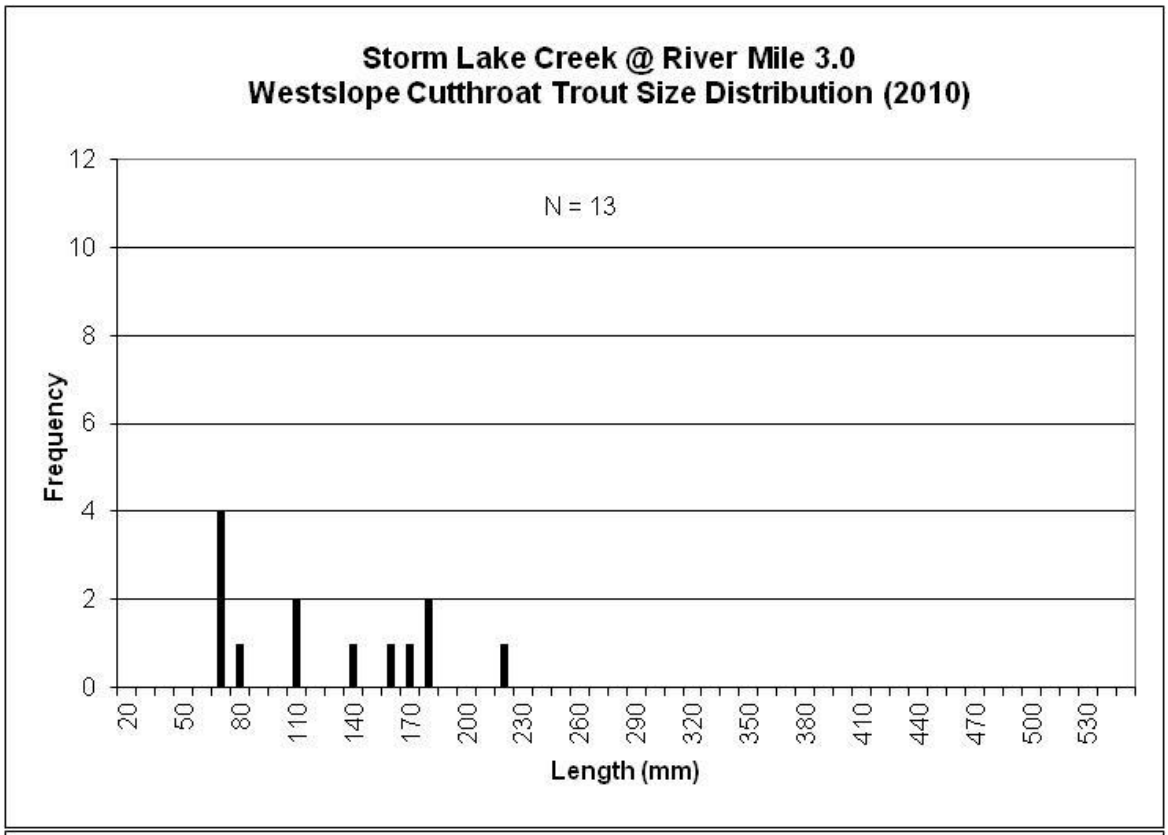

Twin Lakes Creek @ River Mile 4.7
BrookTrout Size Distribution (2010)
N = 9
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

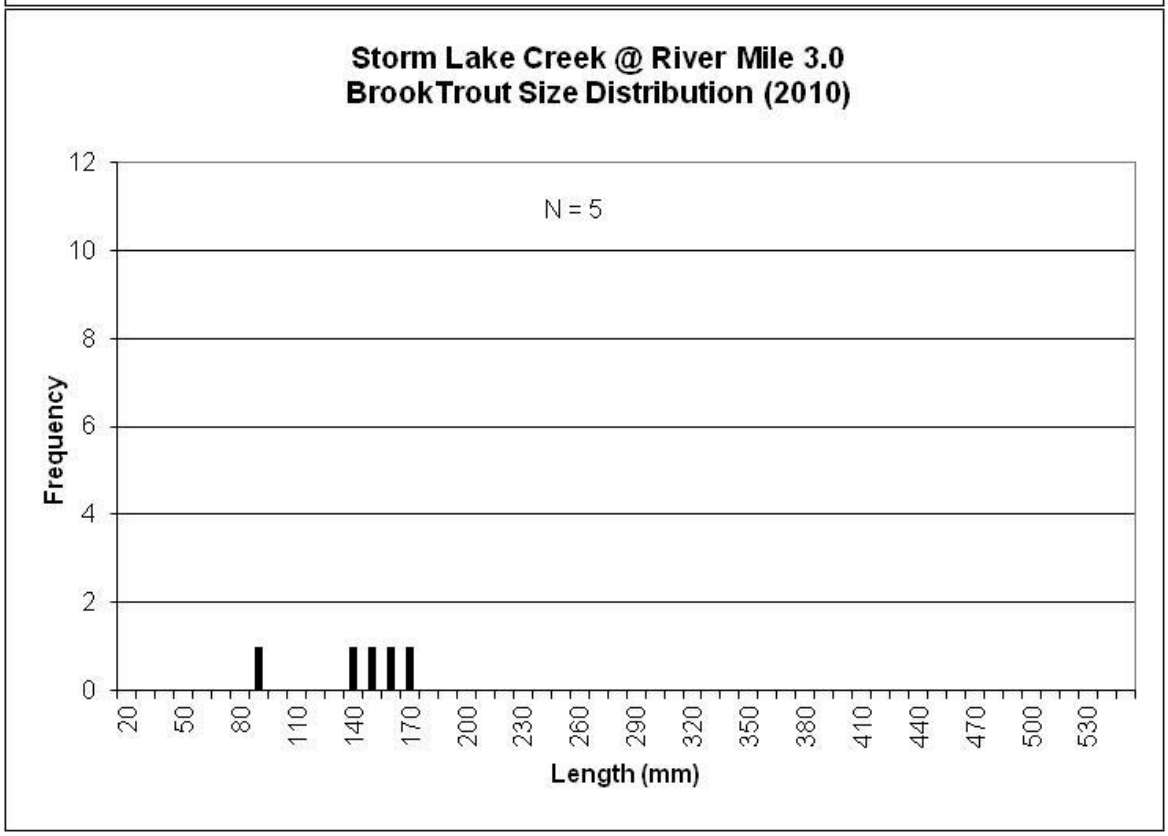

Storm Lake Creek @ River Mile 0.6
Westslope Cutthroat Trout Size Distribution (2010)
N = 18
Frequency
Length (mm)
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

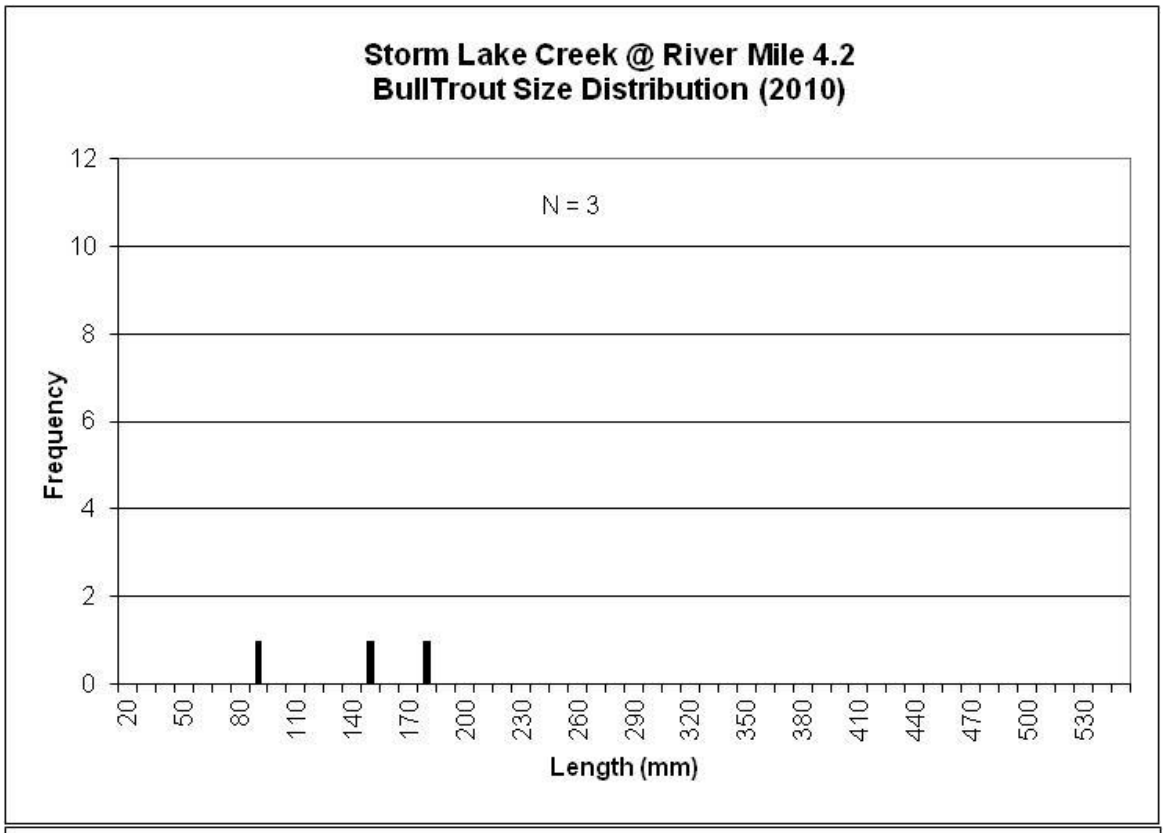

Storm Lake Creek @ River Mile 0.6
BrookTrout Size Distribution (2010)
N = 7
Frequency
Length (mm)
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

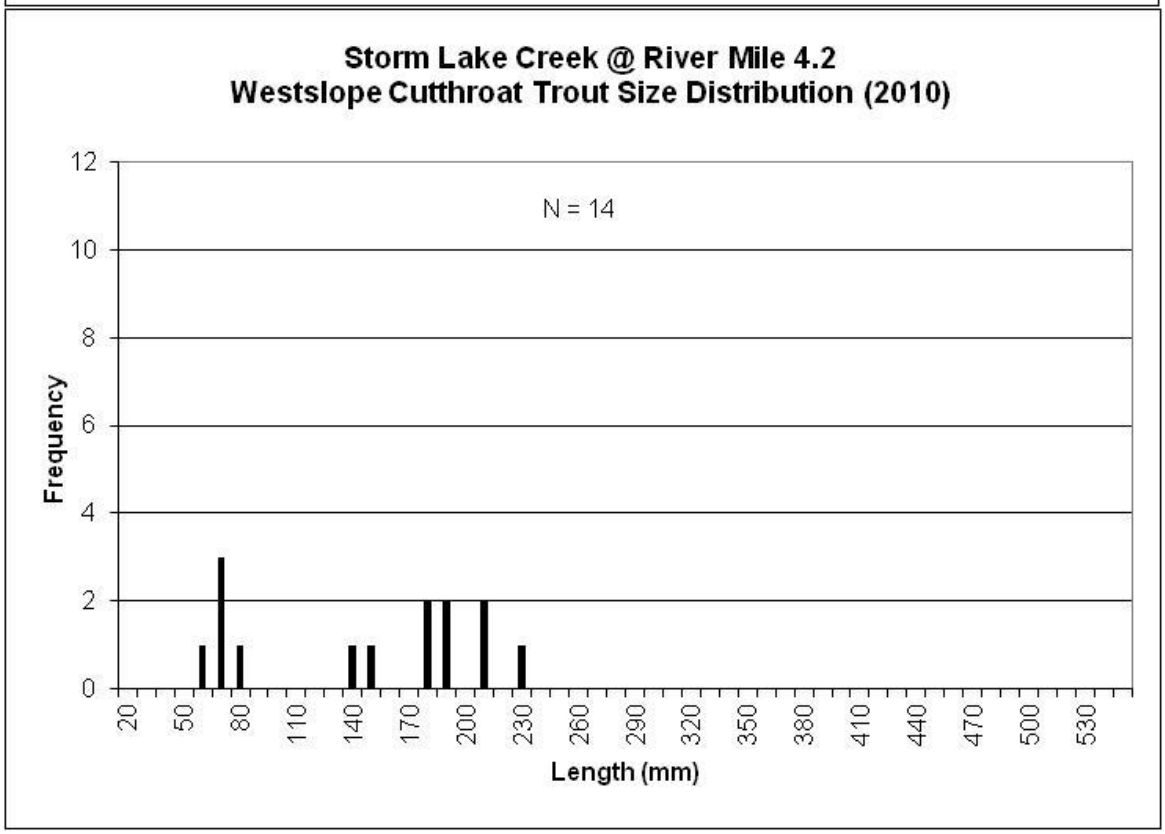

Storm Lake Creek @ River Mile 1.4
Westslope Cutthroat Trout Size Distribution (2010)
N = 14
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

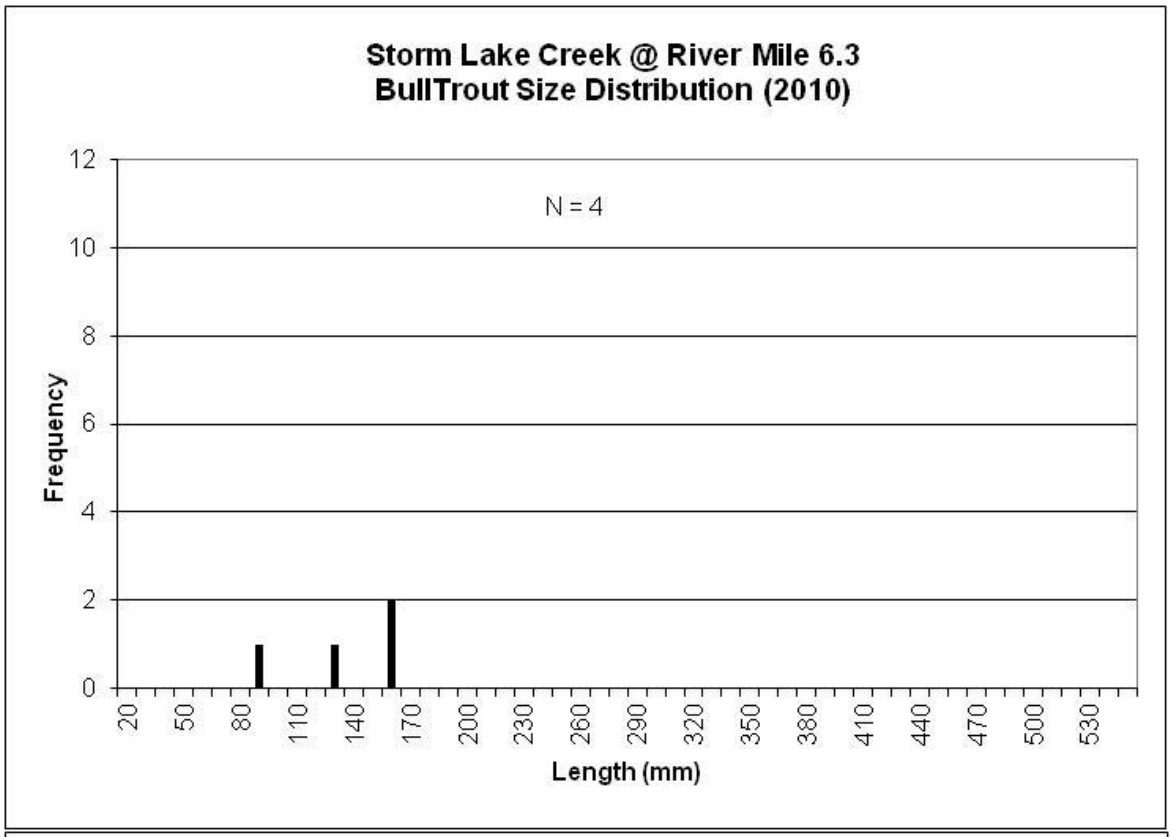

Storm Lake Creek @ River Mile 1.4
BrookTrout Size Distribution (2010)
N = 7
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

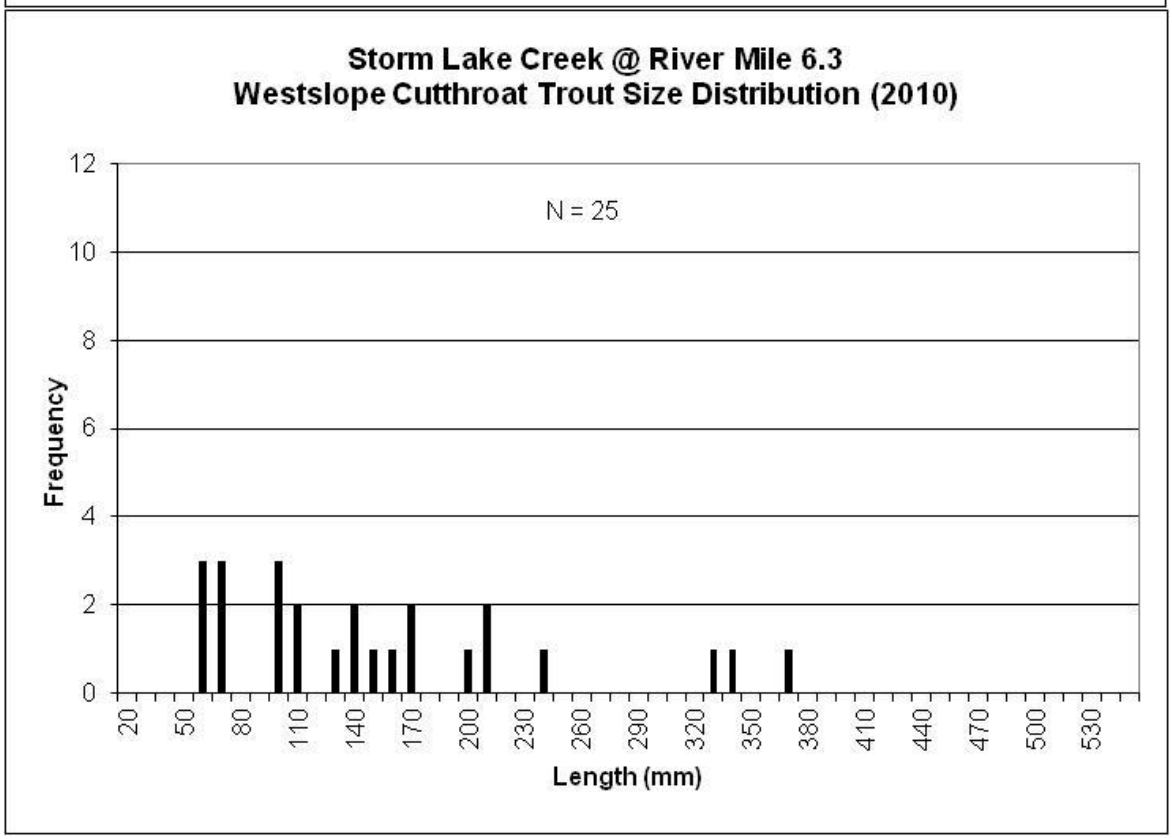

Storm Lake Creek @ River Mile 3.0
Westslope Cutthroat Trout Size Distribution (2010)
N = 13
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

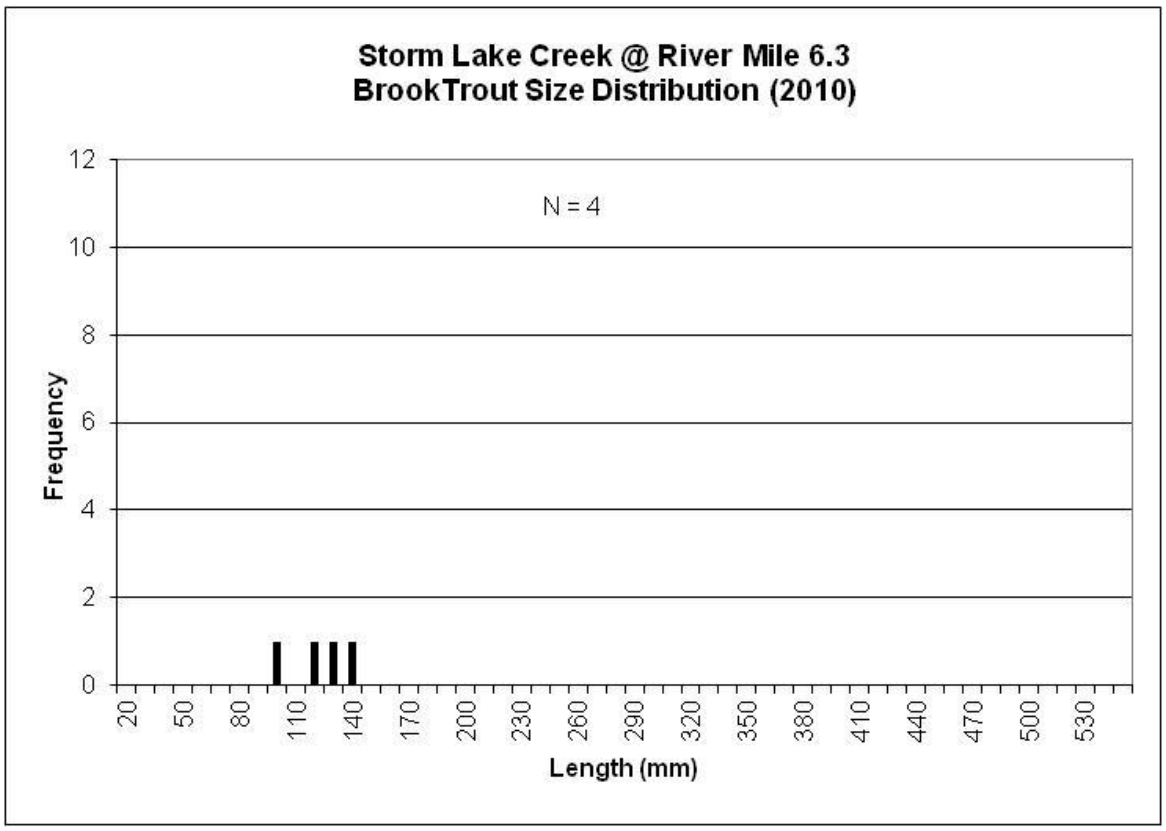

Storm Lake Creek @ River Mile 3.0
BrookTrout Size Distribution (2010)
N = 5
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

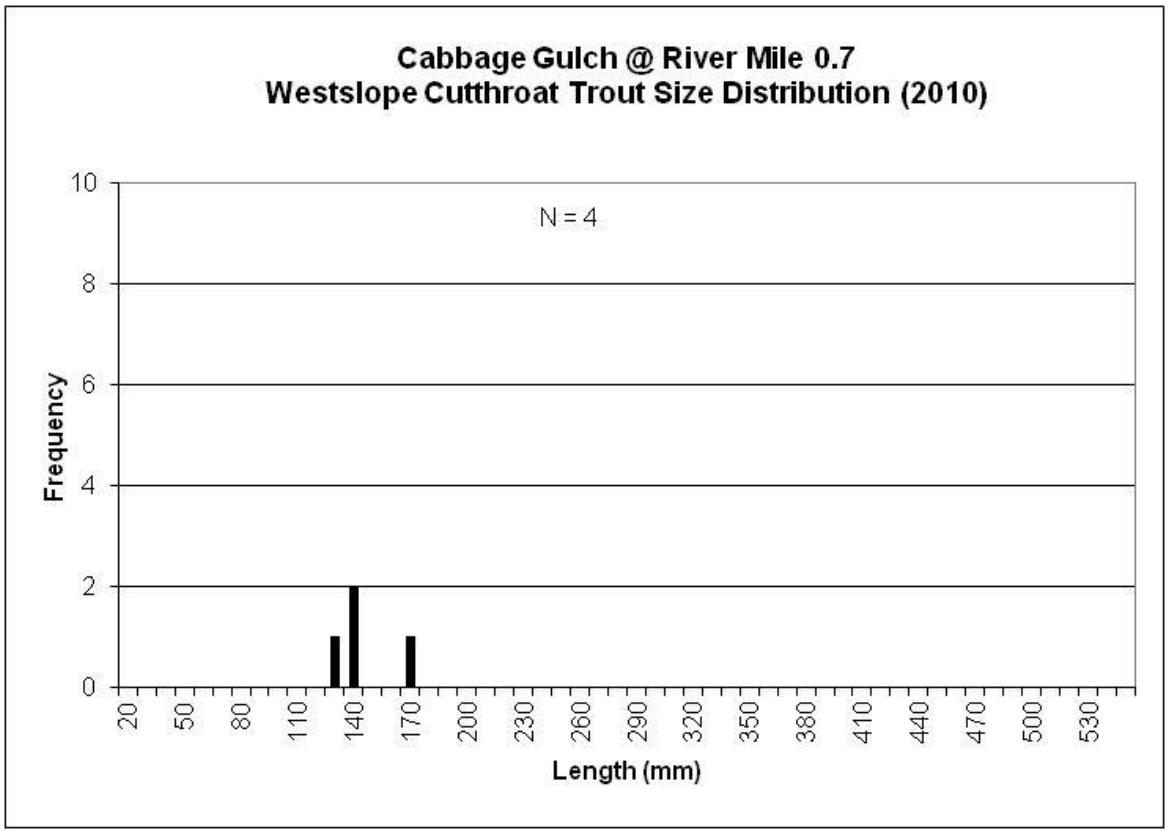

Storm Lake Creek @ River Mile 4.2
BullTrout Size Distribution (2010)
N = 3
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

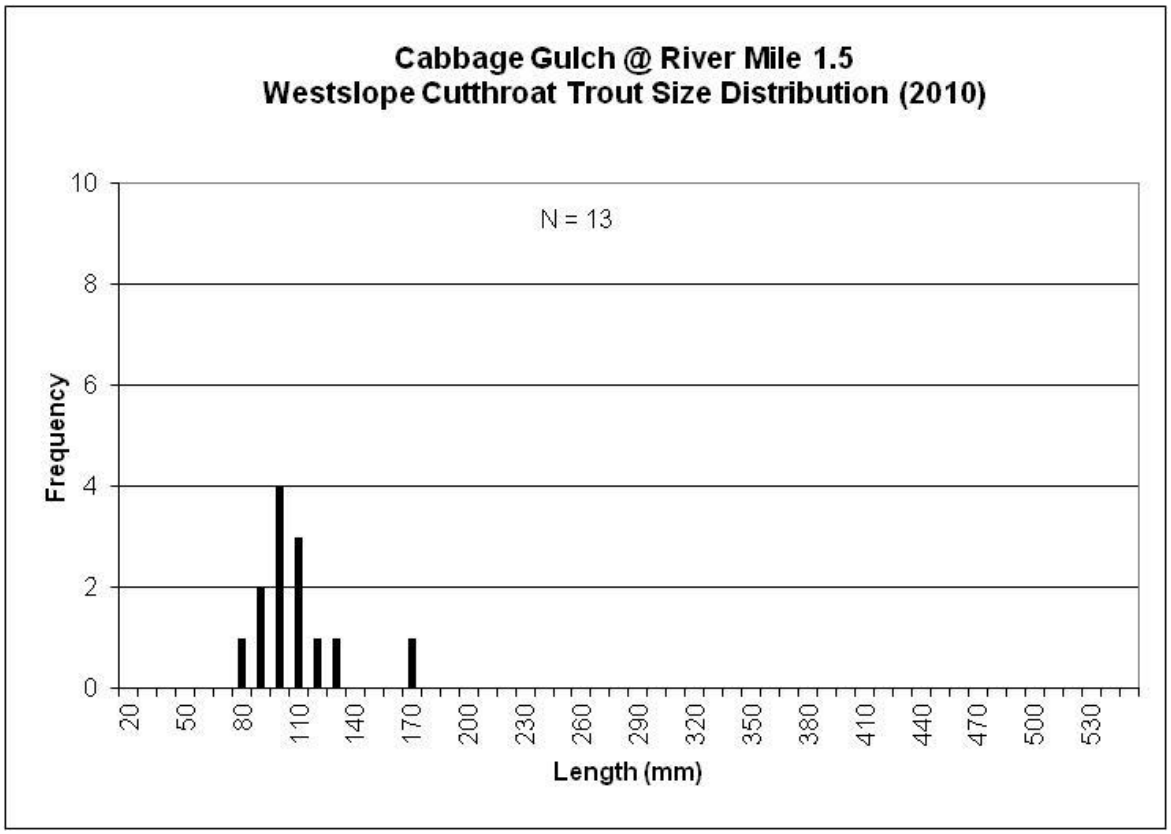

Storm Lake Creek @ River Mile 4.2
Westslope Cutthroat Trout Size Distribution (2010)
N = 14
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

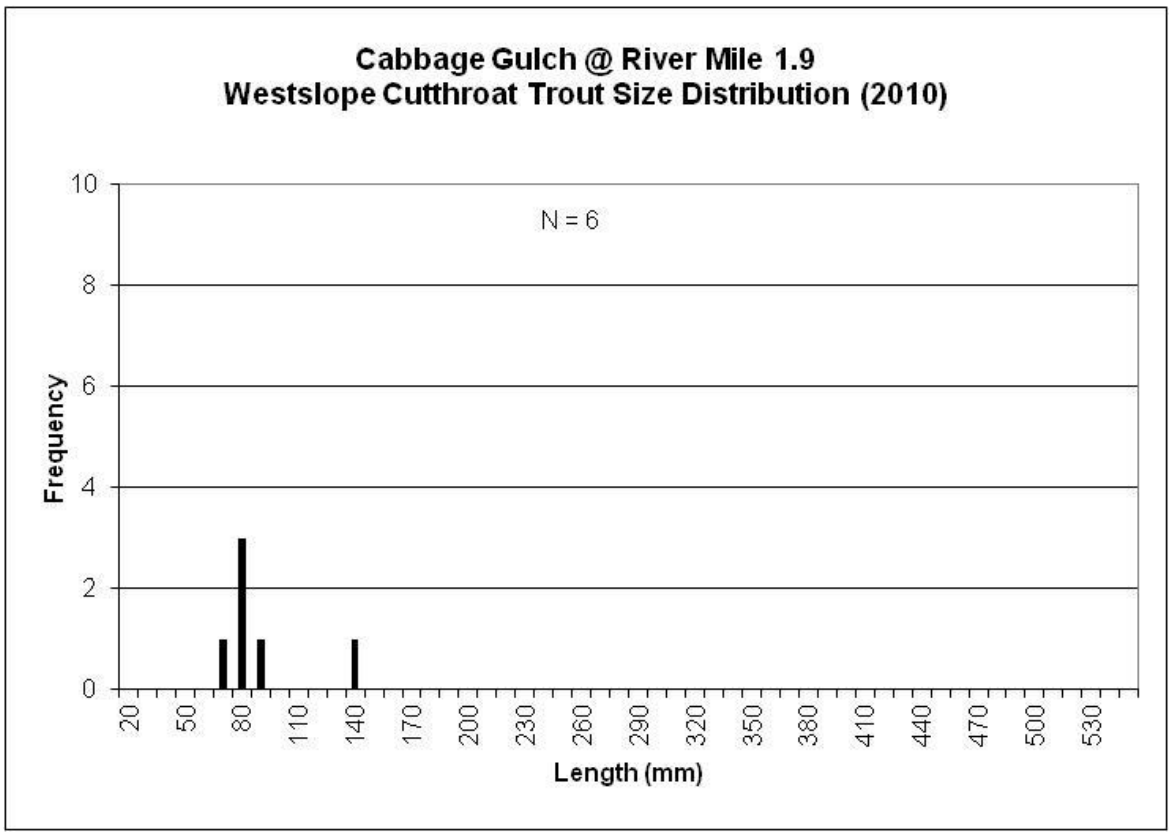

Storm Lake Creek @ River Mile 6.3
BullTrout Size Distribution (2010)
N = 4
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

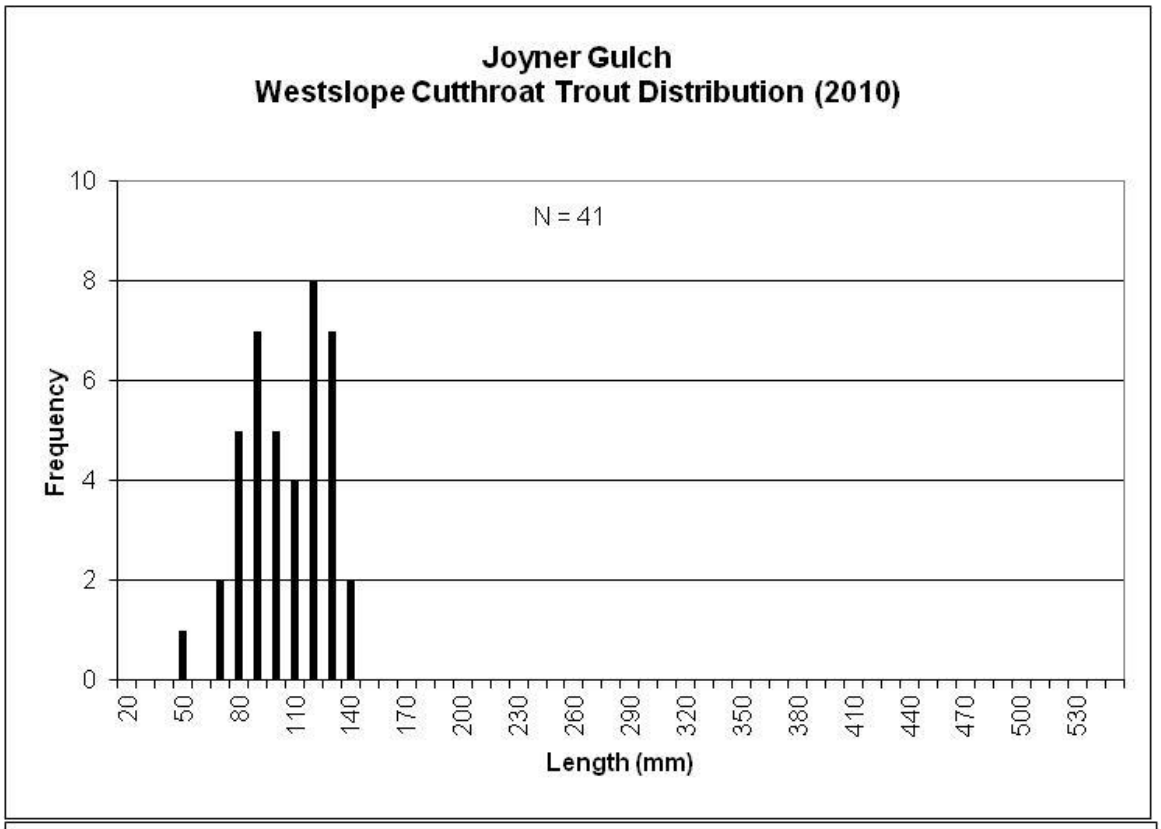

Storm Lake Creek @ River Mile 6.3
Westslope Cutthroat Trout Size Distribution (2010)
N = 25
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

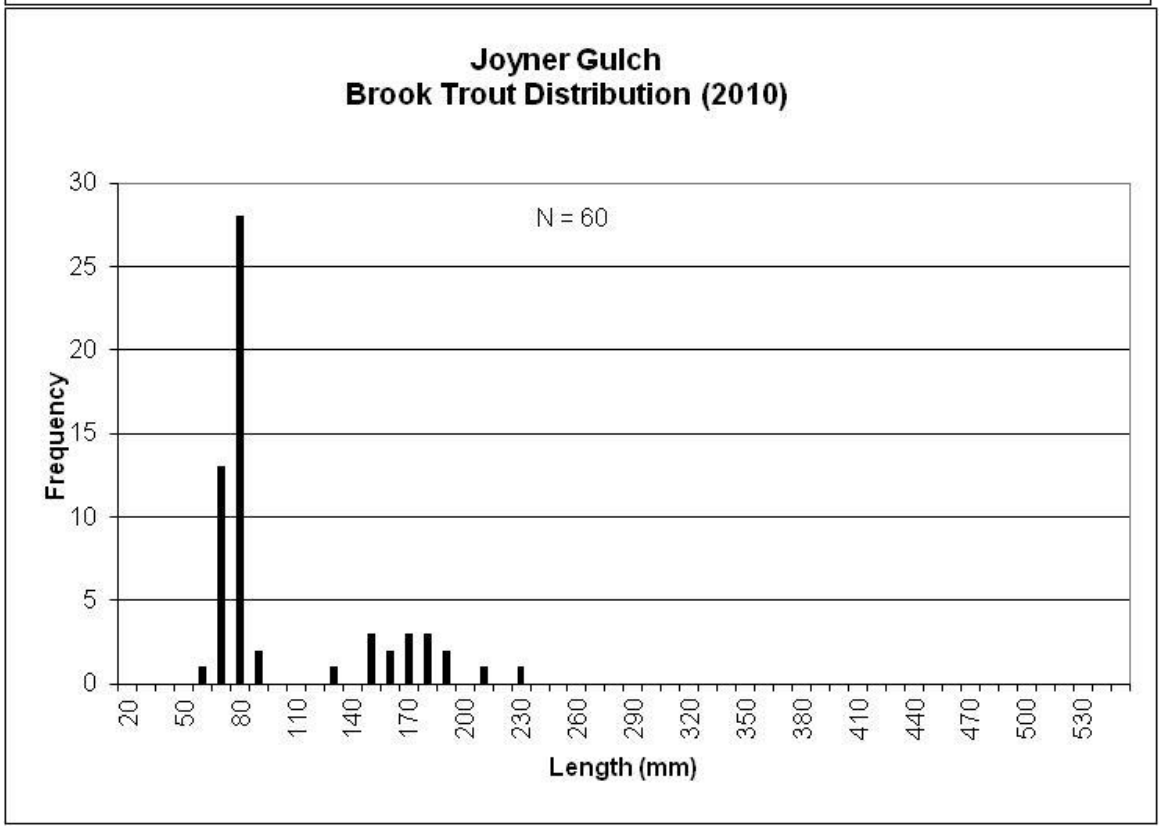

Storm Lake Creek @ River Mile 6.3
BrookTrout Size Distribution (2010)
N = 4
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

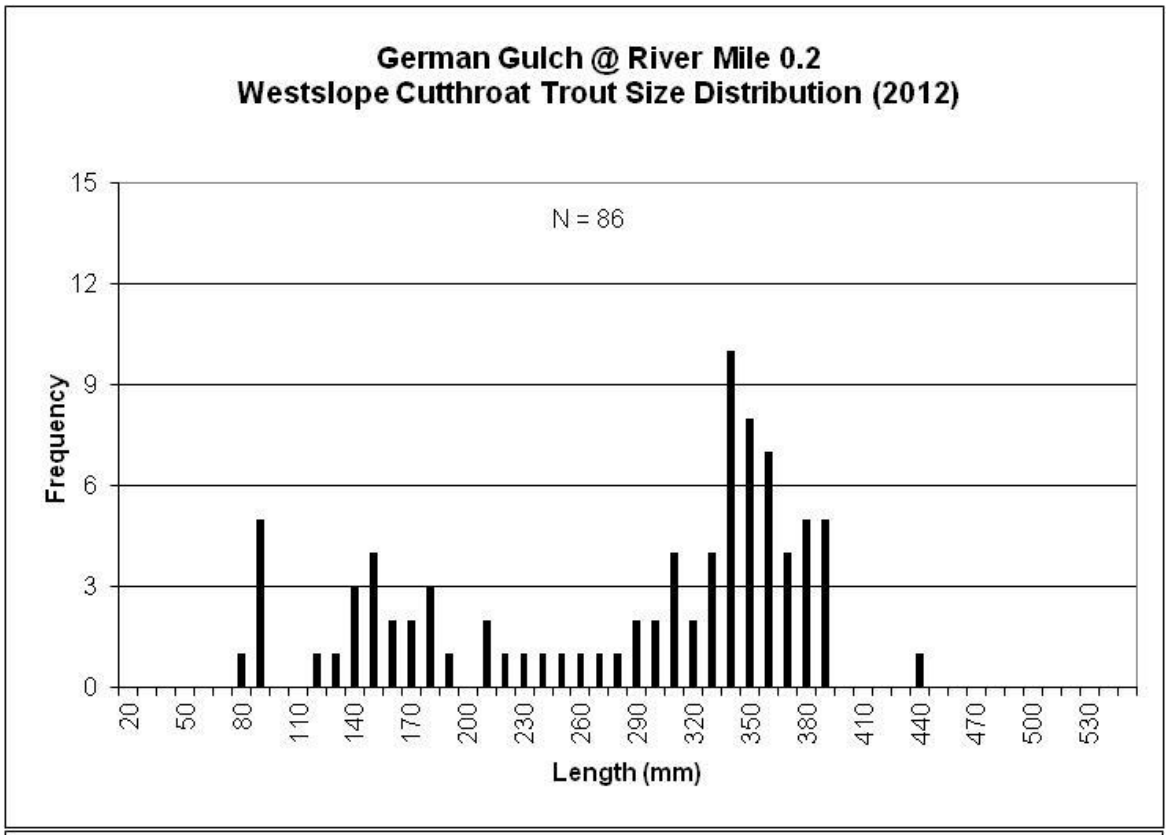

Cabbage Gulch @ River Mile 0.7
Westslope Cutthroat Trout Size Distribution (2010)
N = 4
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

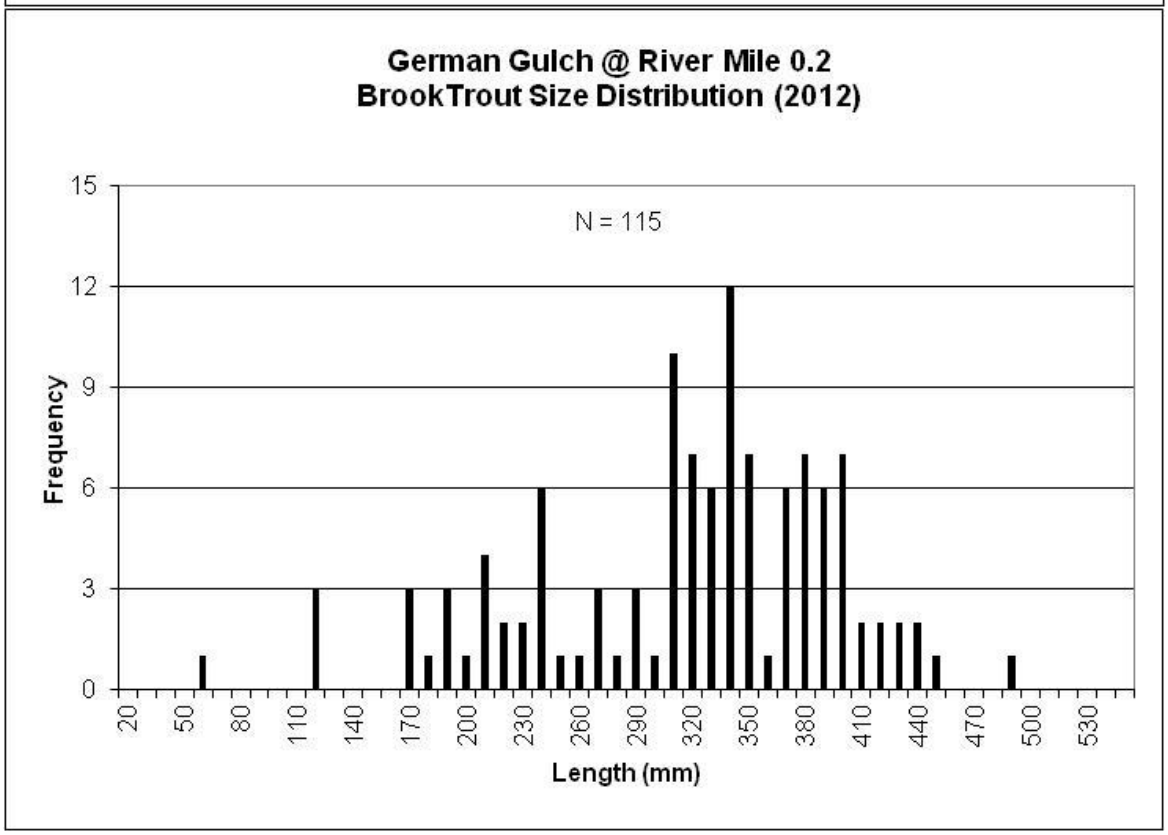

Cabbage Gulch @ River Mile 1.5
Westslope Cutthroat Trout Size Distribution (2010)
N = 13
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

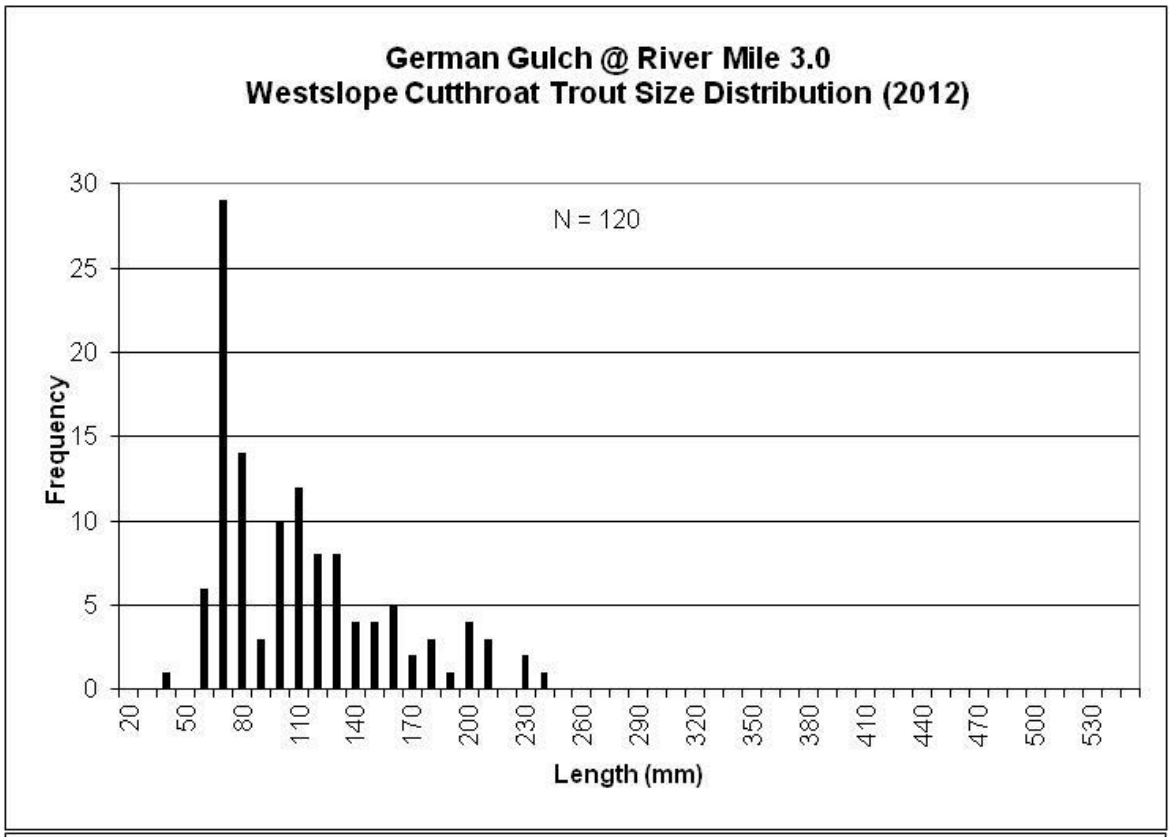

Cabbage Gulch @ River Mile 1.9
Westslope Cutthroat Trout Size Distribution (2010)
N = 6
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

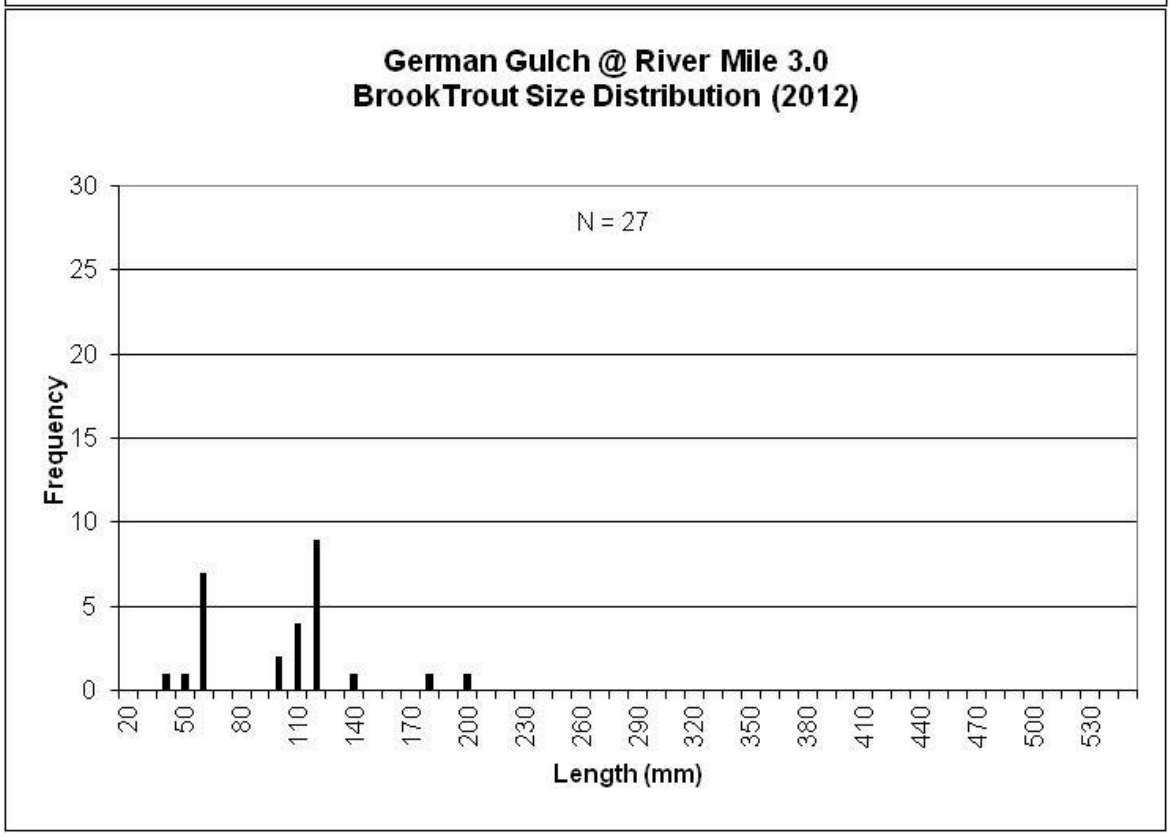

Joyner Gulch
Westslope Cutthroat Trout Distribution (2010)
N = 41
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

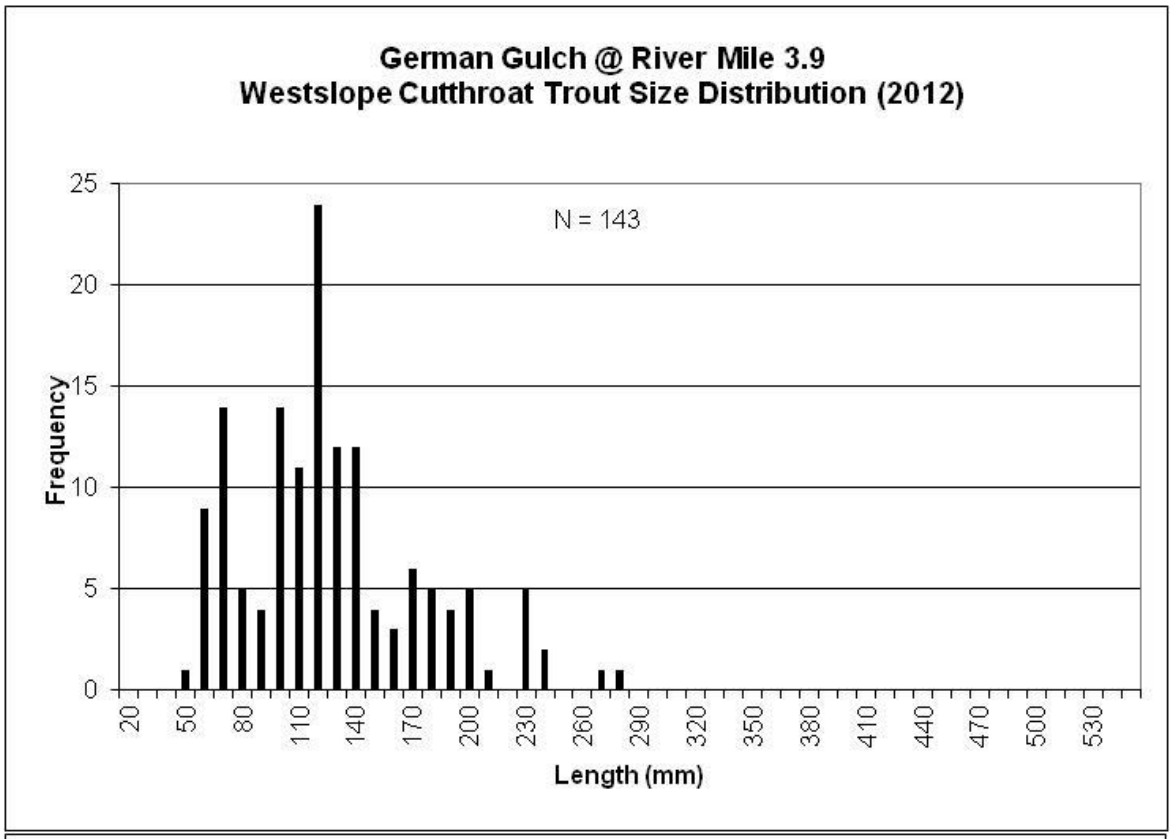

Joyner Gulch
Brook Trout Distribution (2010)
N = 60
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

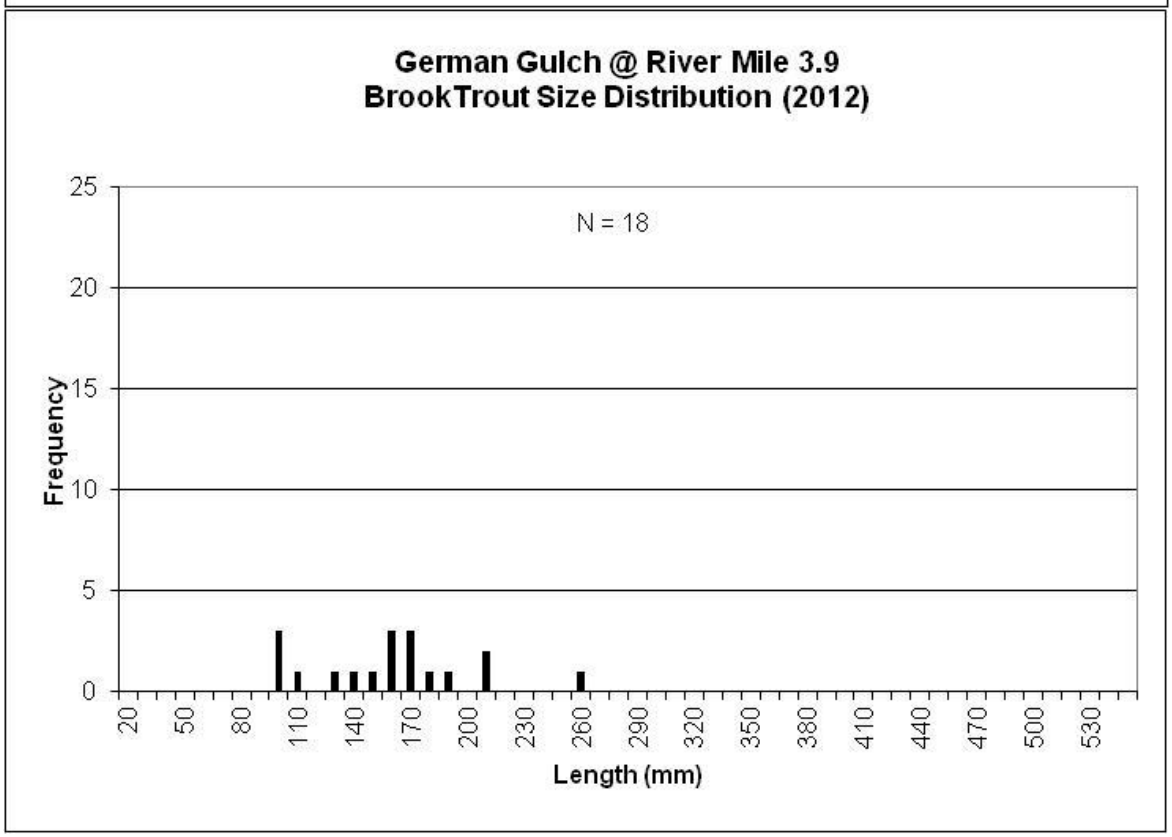

German Gulch @ River Mile 0.2
Westslope Cutthroat Trout Size Distribution (2012)
N = 86
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

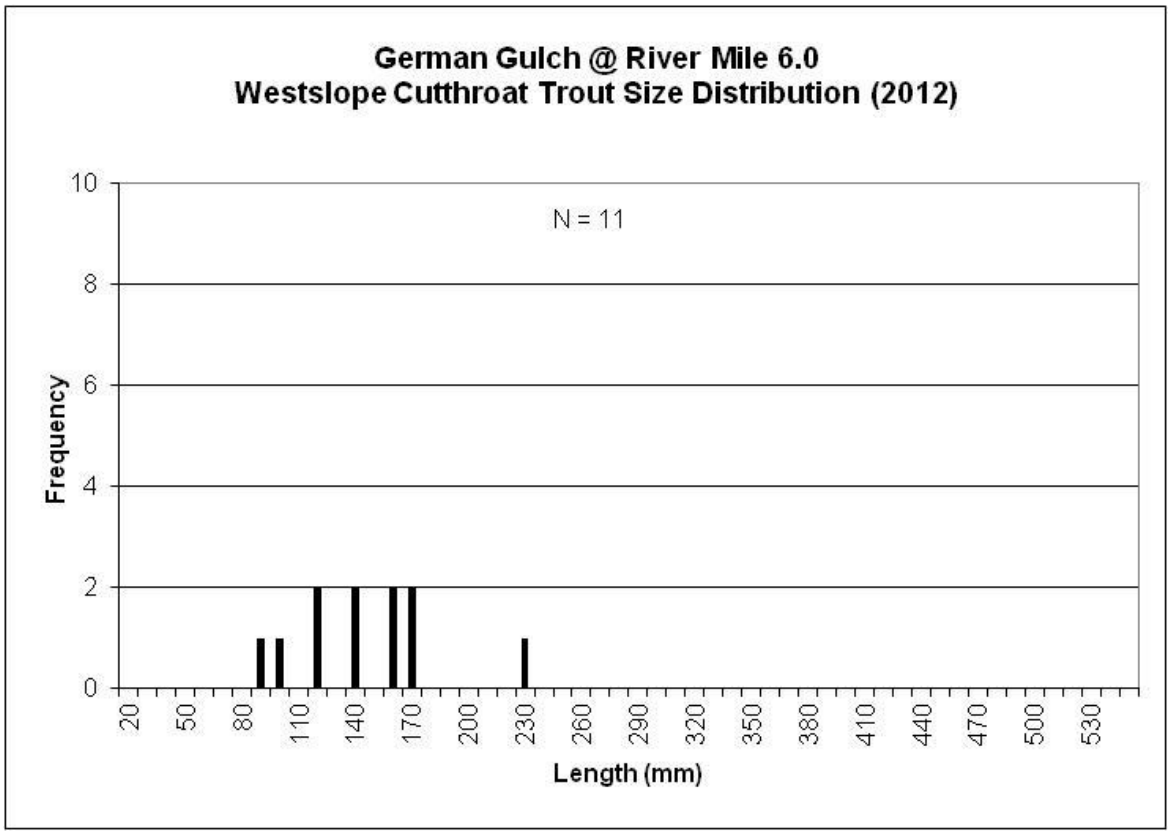

German Gulch @ River Mile 0.2
BrookTrout Size Distribution (2012)
N = 115
Frequency
0
3
6
9
12
15
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

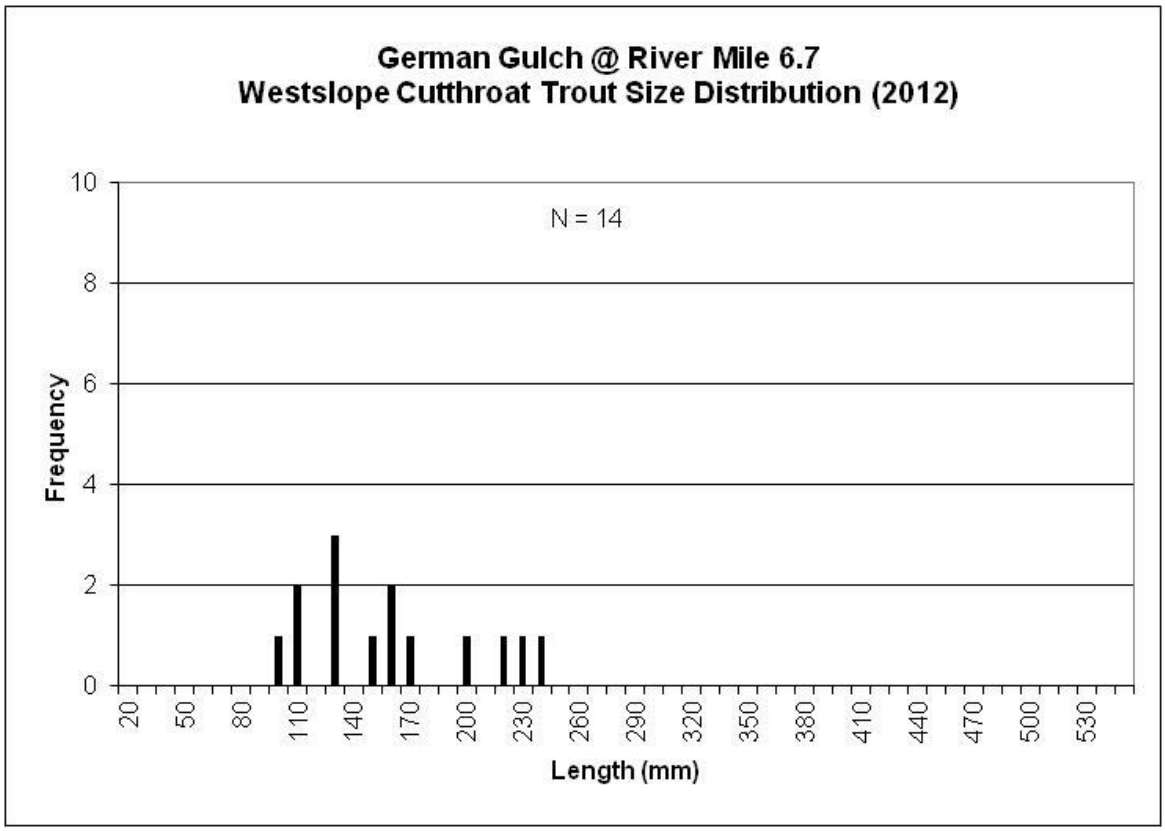

German Gulch @ River Mile 3.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 120
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

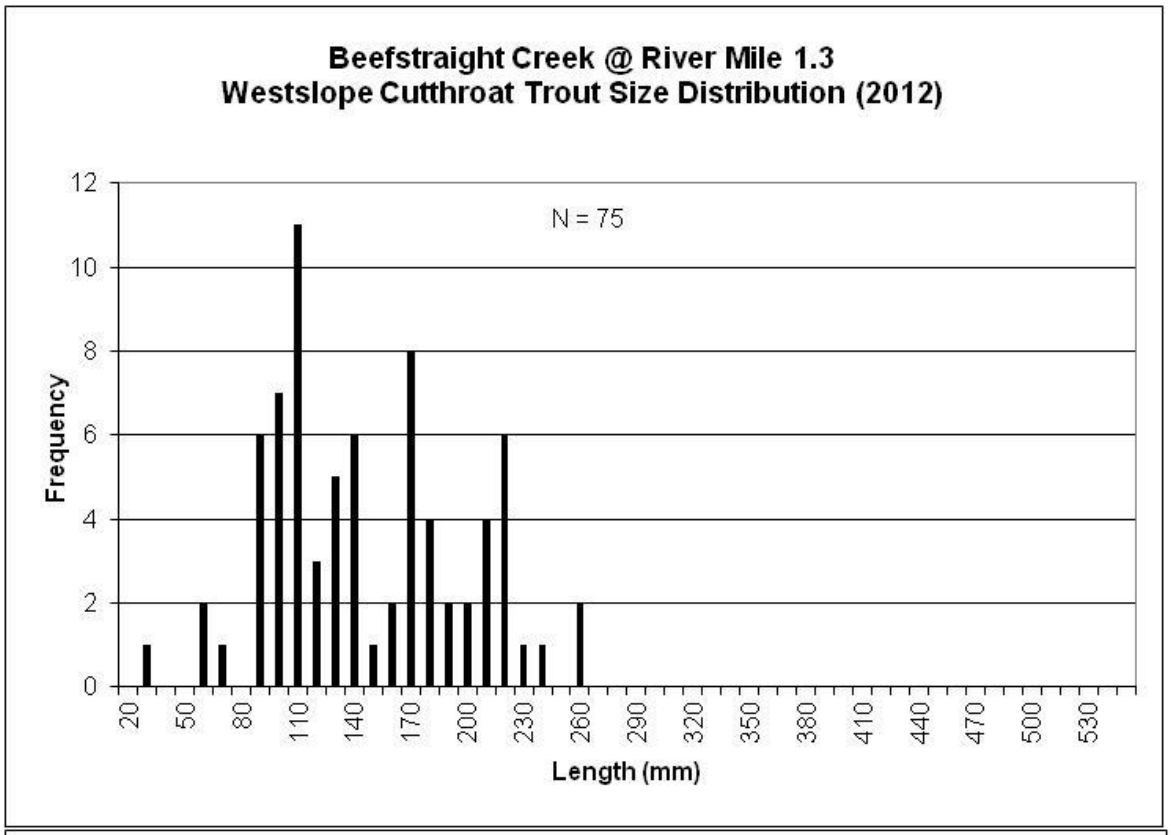

German Gulch @ River Mile 3.0
BrookTrout Size Distribution (2012)
N = 27
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

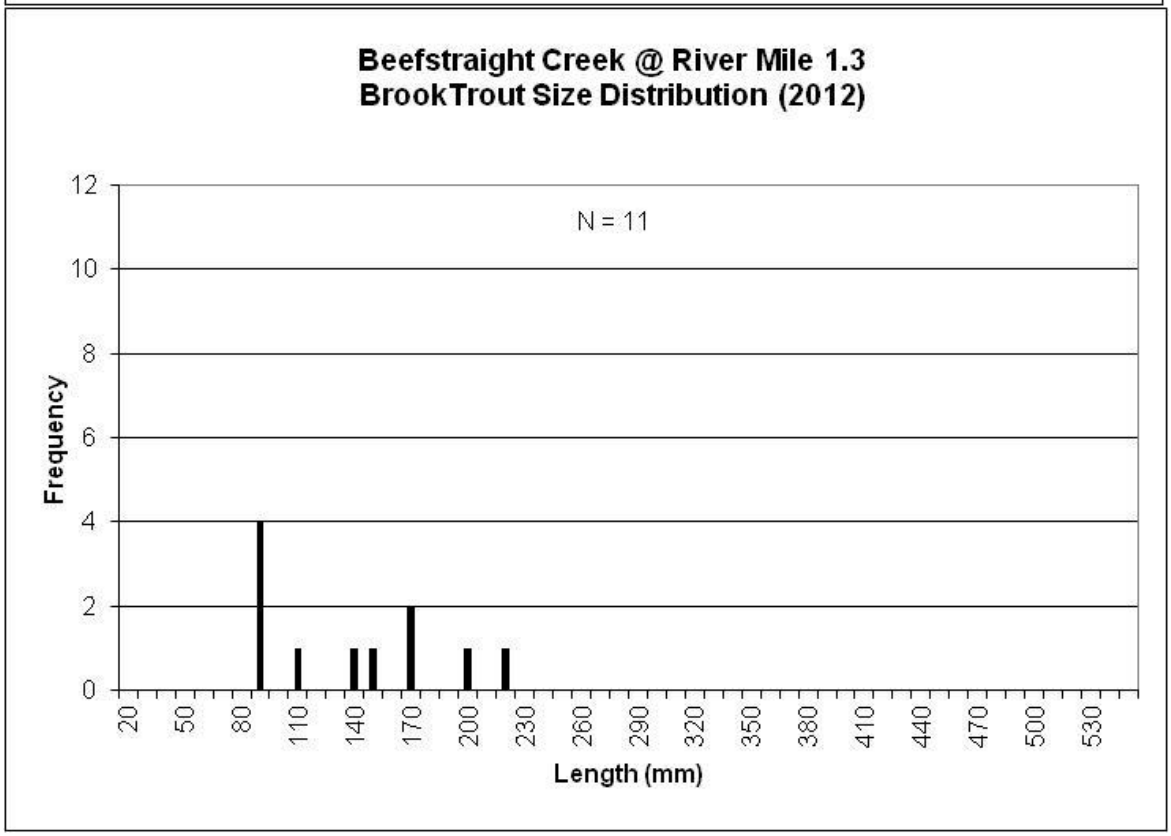

German Gulch @ River Mile 3.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 143
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

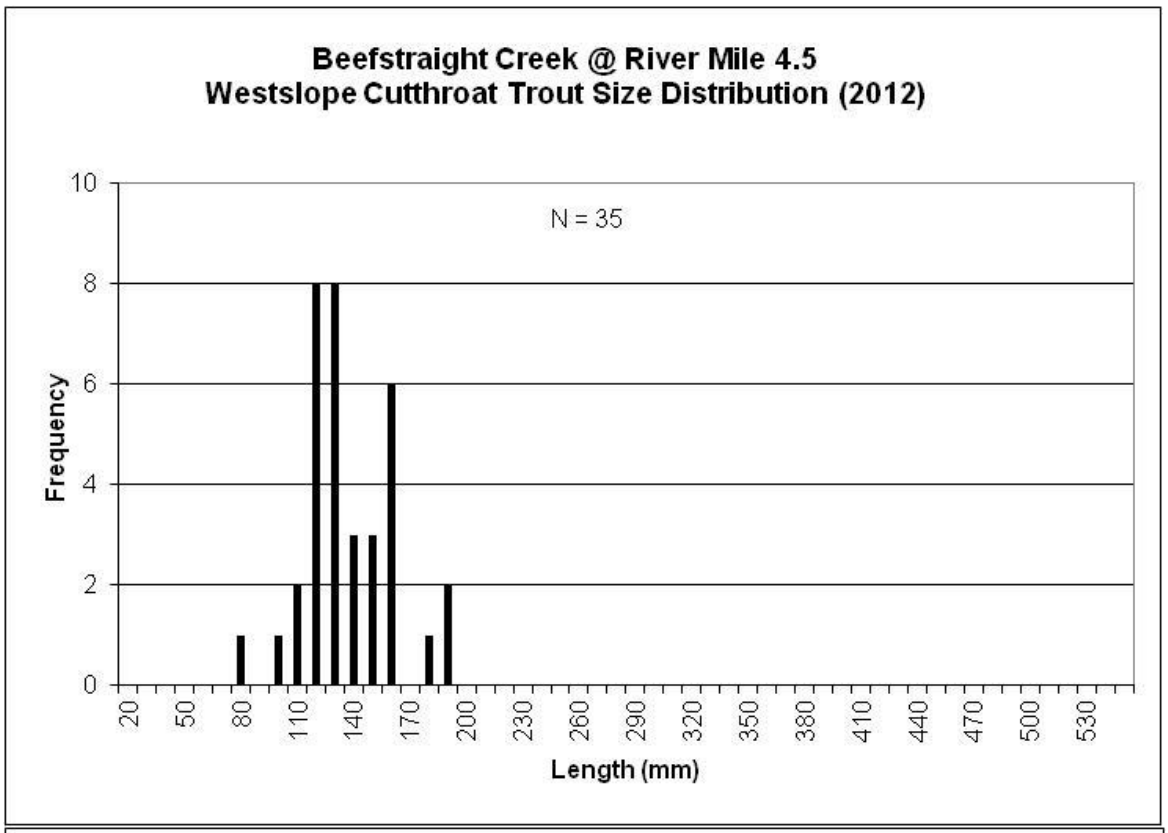

German Gulch @ River Mile 3.9
BrookTrout Size Distribution (2012)
N = 18
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

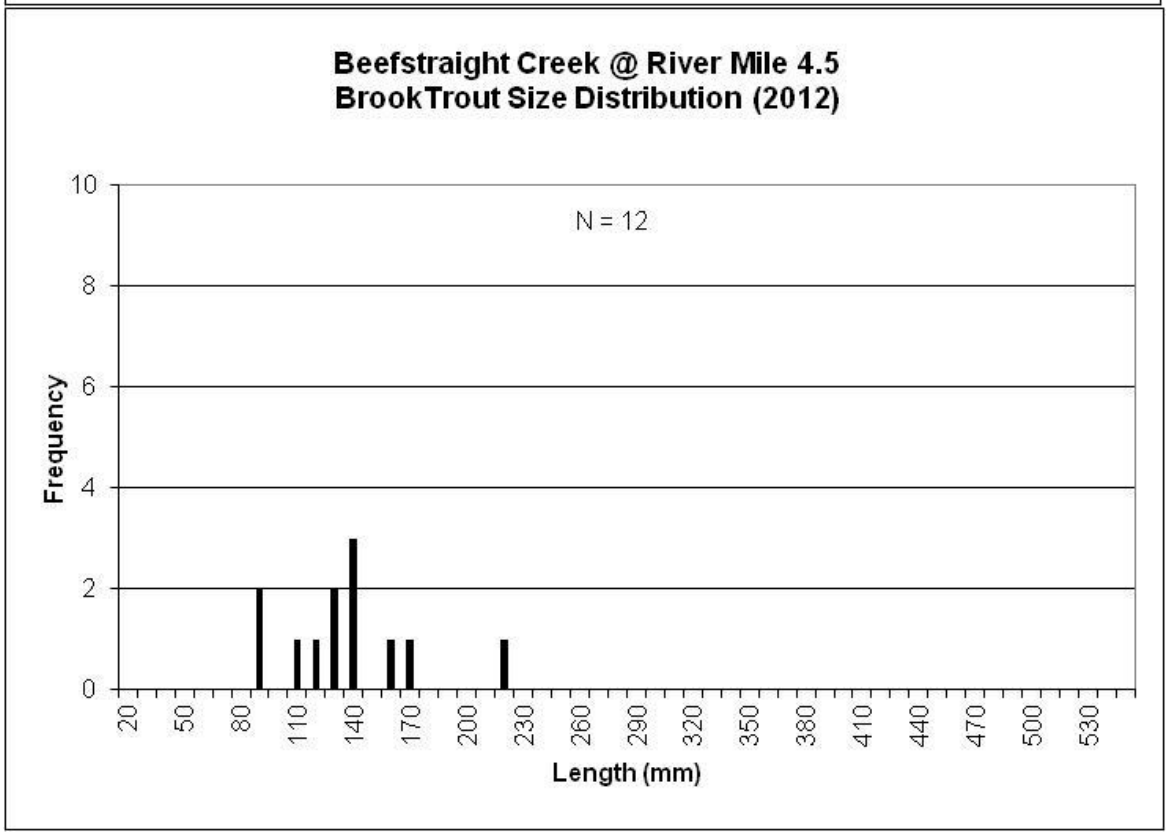

German Gulch @ River Mile 6.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 11
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

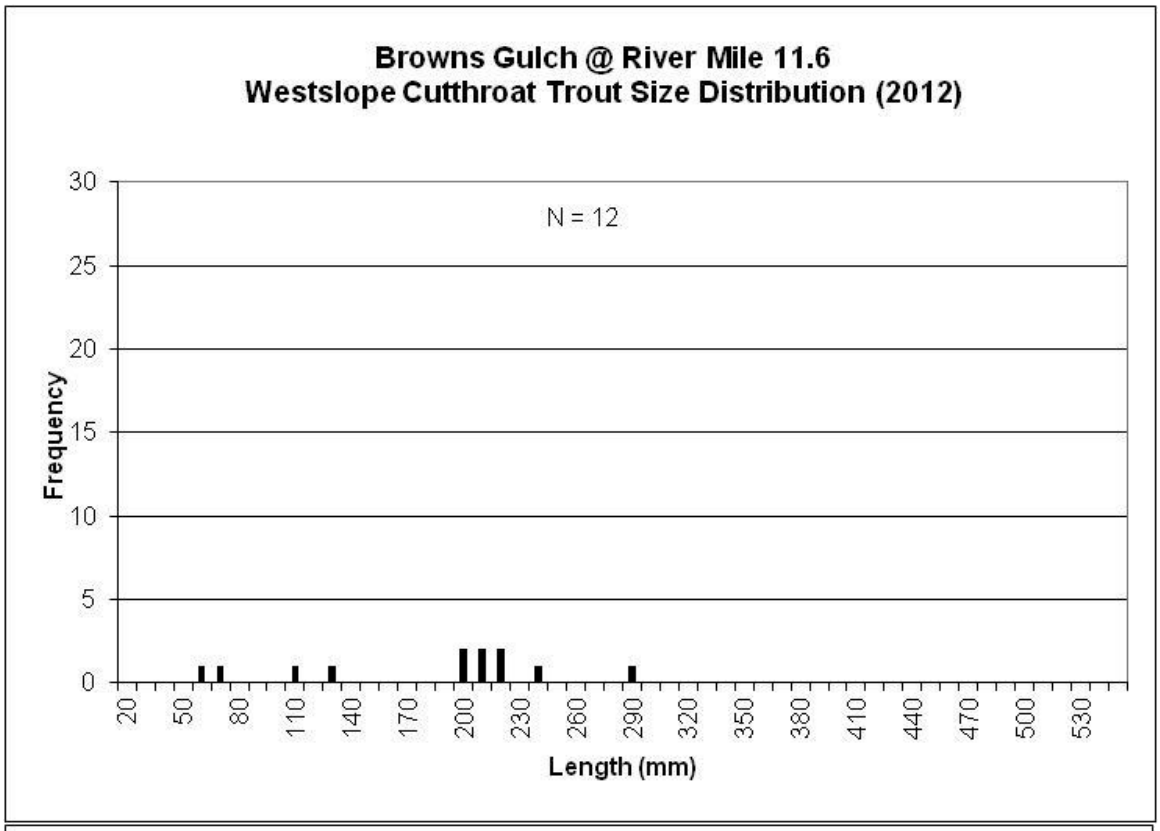

German Gulch @ River Mile 6.7
Westslope Cutthroat Trout Size Distribution (2012)
N = 14
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

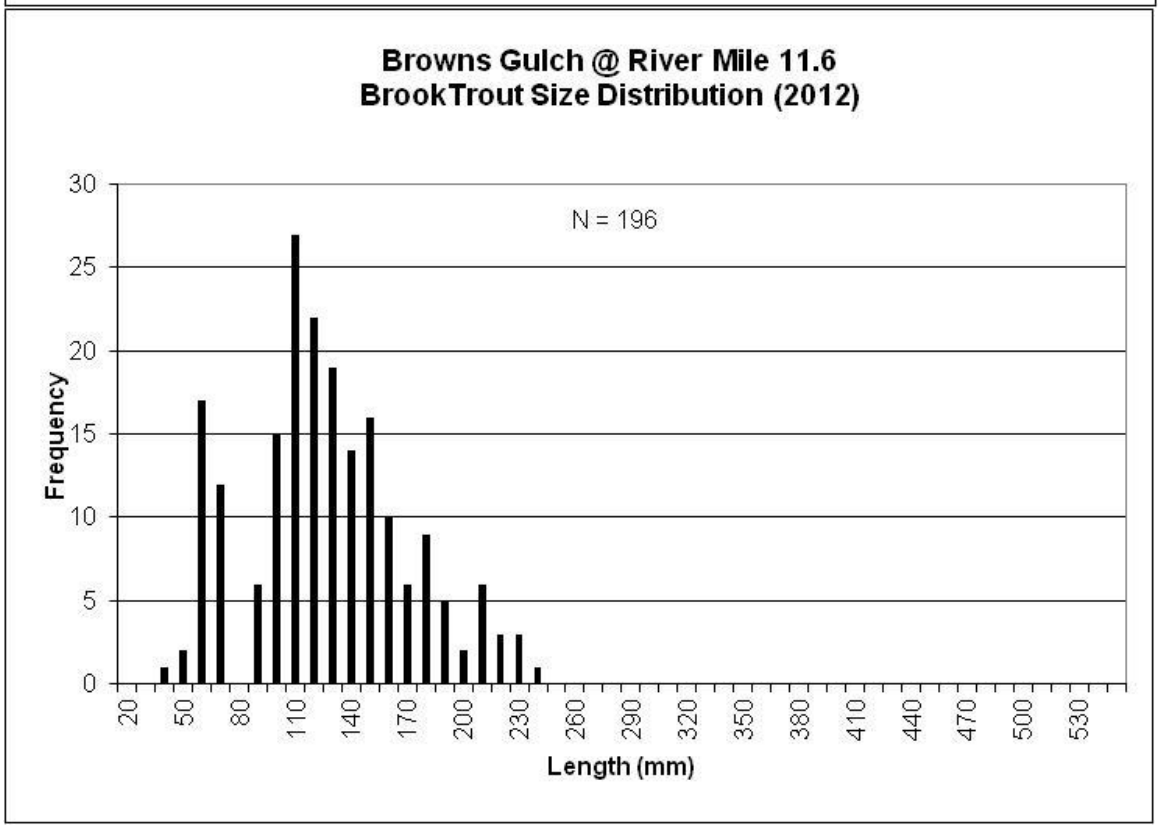

Beefstraight Creek @ River Mile 1.3
Westslope Cutthroat Trout Size Distribution (2012)
N = 75
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

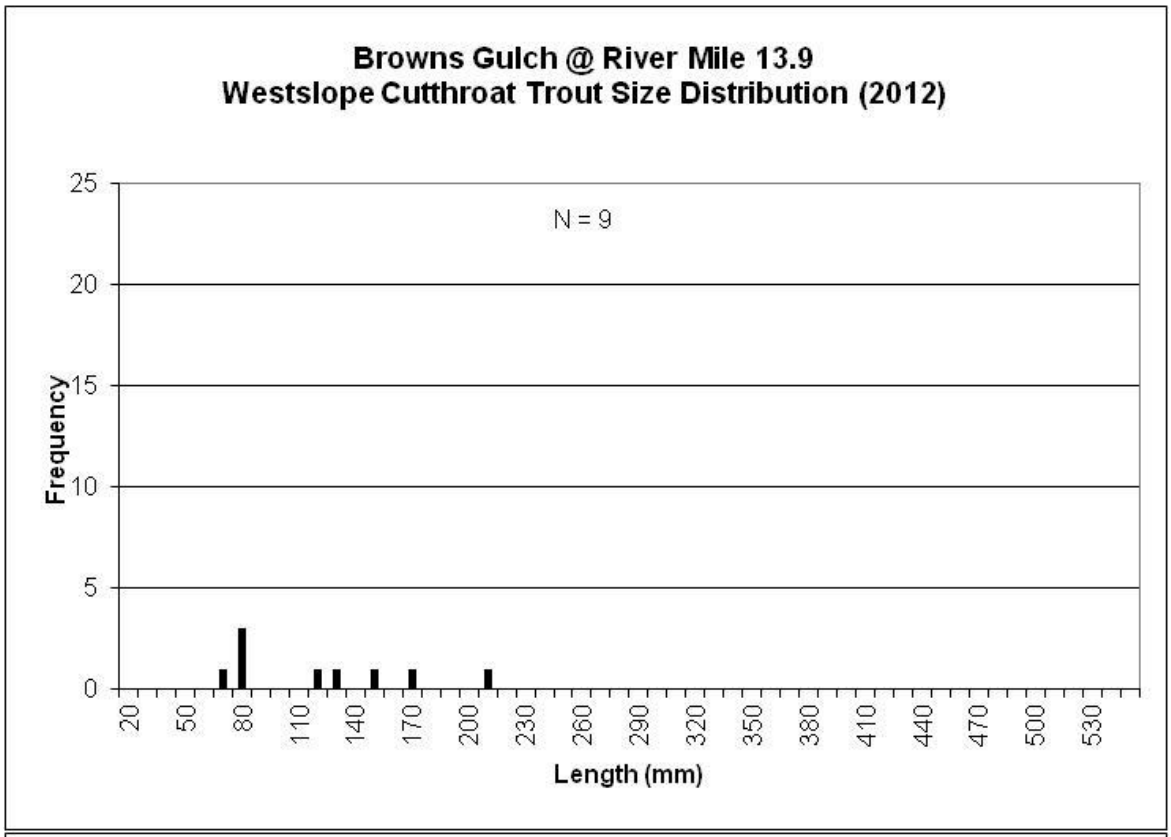

Beefstraight Creek @ River Mile 1.3
BrookTrout Size Distribution (2012)
N = 11
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

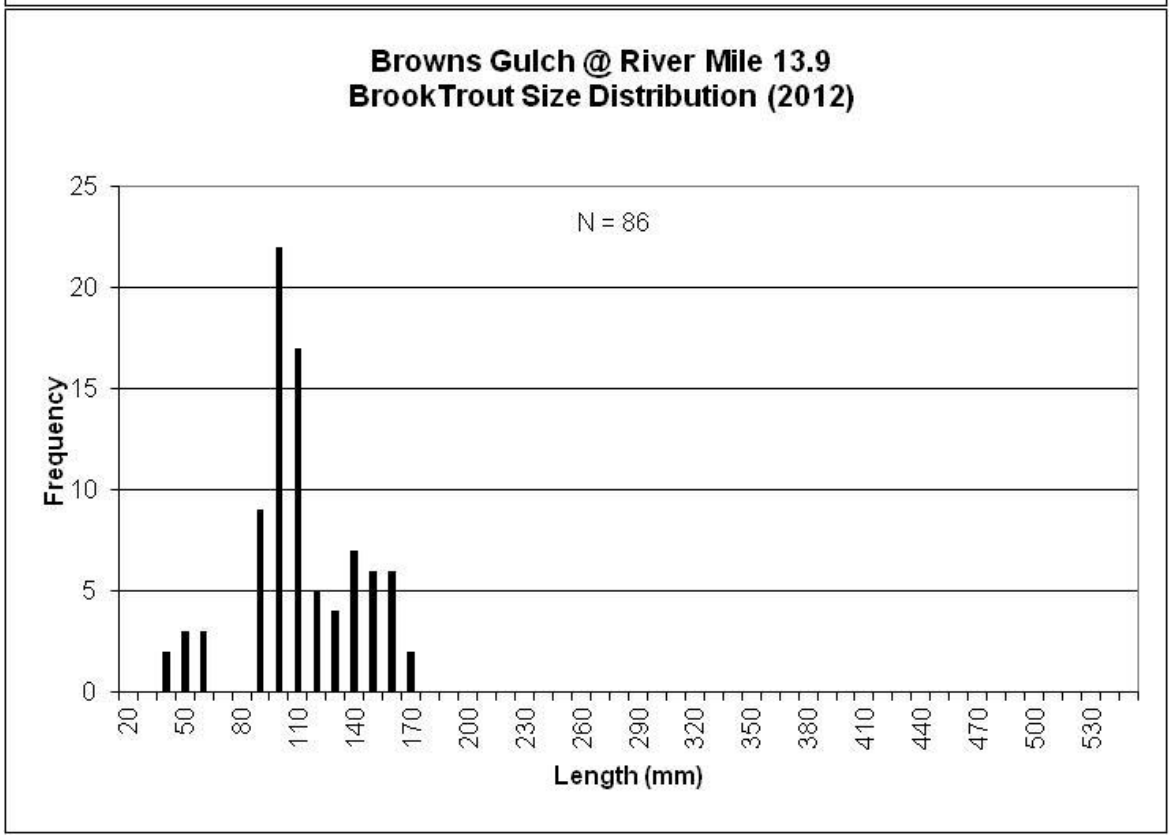

Beefstraight Creek @ River Mile 4.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 35
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

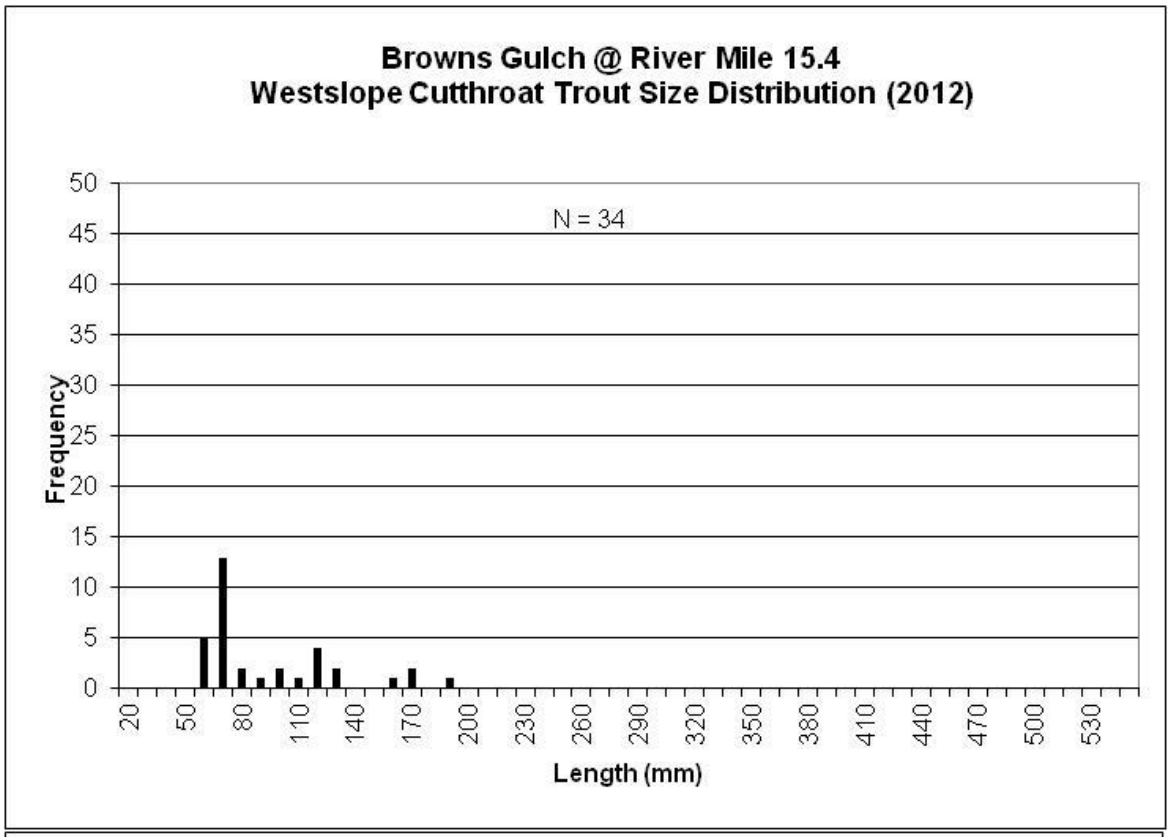

Beefstraight Creek @ River Mile 4.5
BrookTrout Size Distribution (2012)
N = 12
Frequency
Length (mm)
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

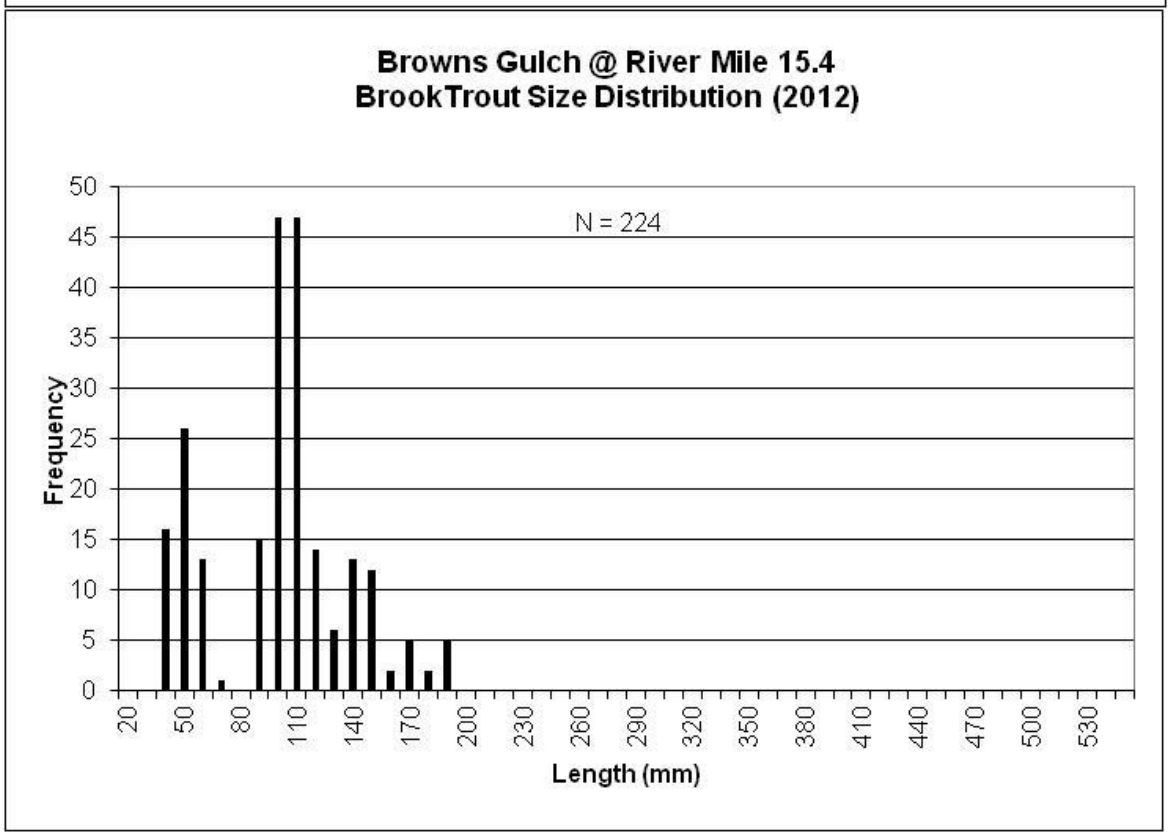

Browns Gulch @ River Mile 11.6
Westslope Cutthroat Trout Size Distribution (2012)
N = 12
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Browns Gulch @ River Mile 11.6
BrookTrout Size Distribution (2012)
N = 196
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Browns Gulch @ River Mile 13.9
Westslope Cutthroat Trout Size Distribution (2012)
N = 9
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Browns Gulch @ River Mile 13.9
BrookTrout Size Distribution (2012)
N = 86
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Browns Gulch @ River Mile 15.4
Westslope Cutthroat Trout Size Distribution (2012)
N = 34
Frequency
Length (mm)
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Browns Gulch @ River Mile 15.4
BrookTrout Size Distribution (2012)
N = 224
Frequency
Length (mm)
0
5
10
15
20
25
30
35
40
45
50
20
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80
110
140
170
200
230
260
290
320
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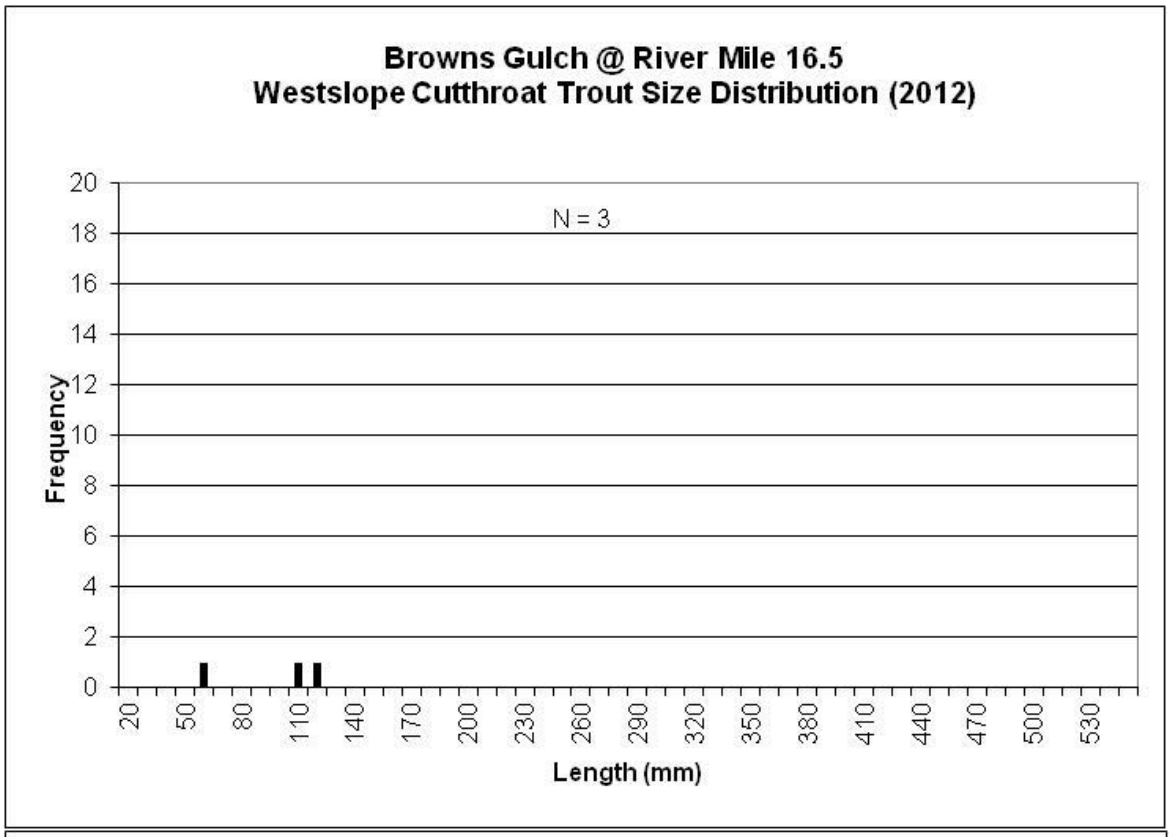
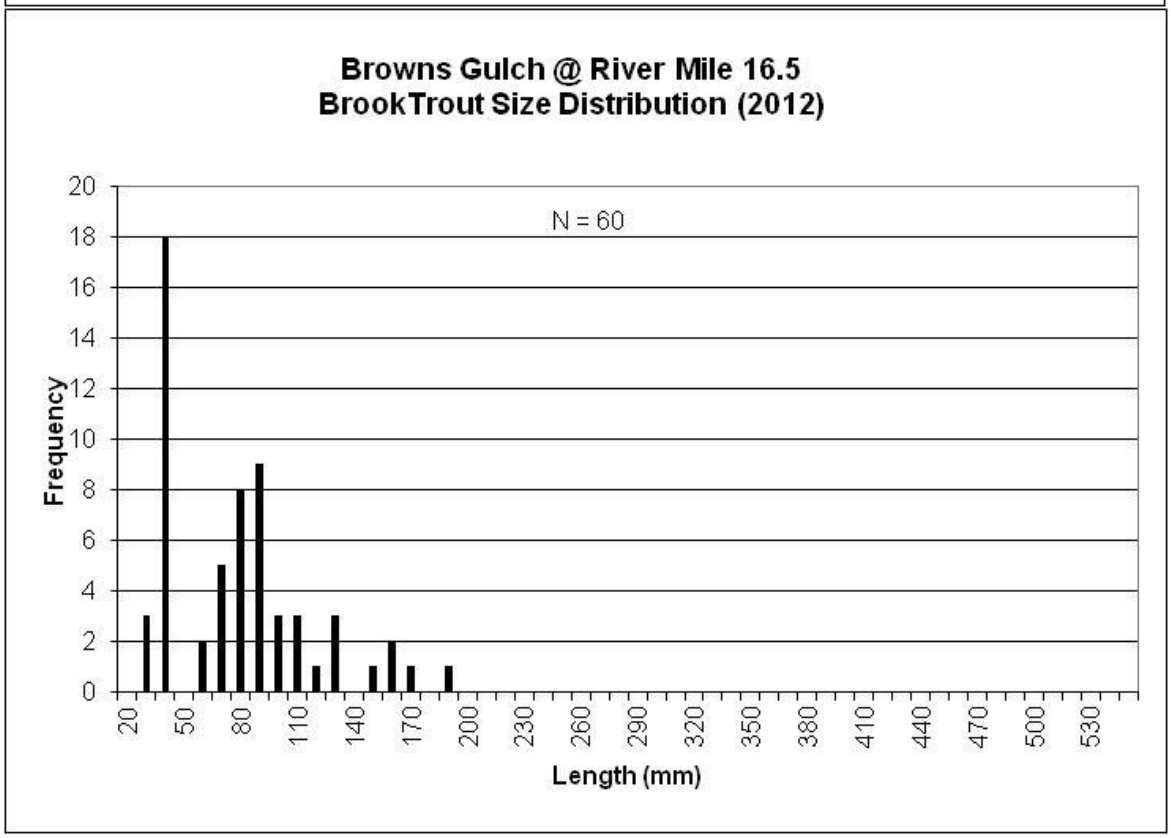
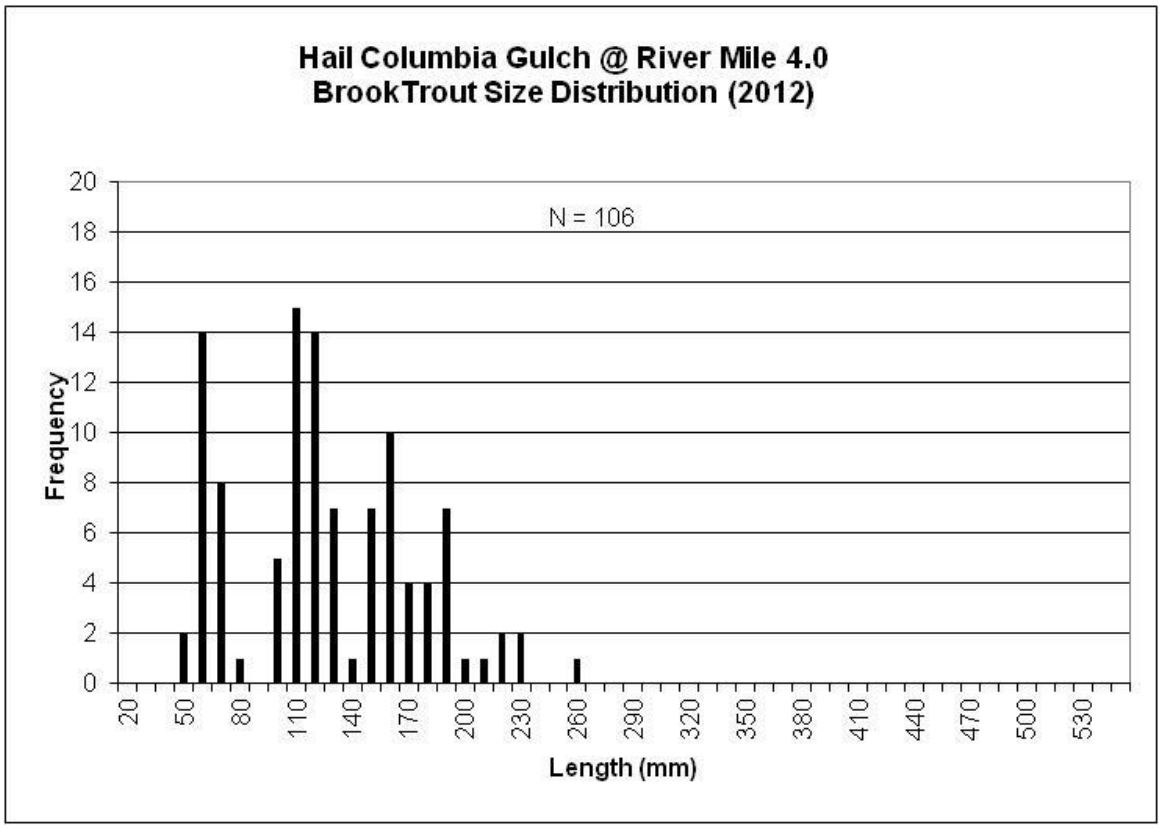
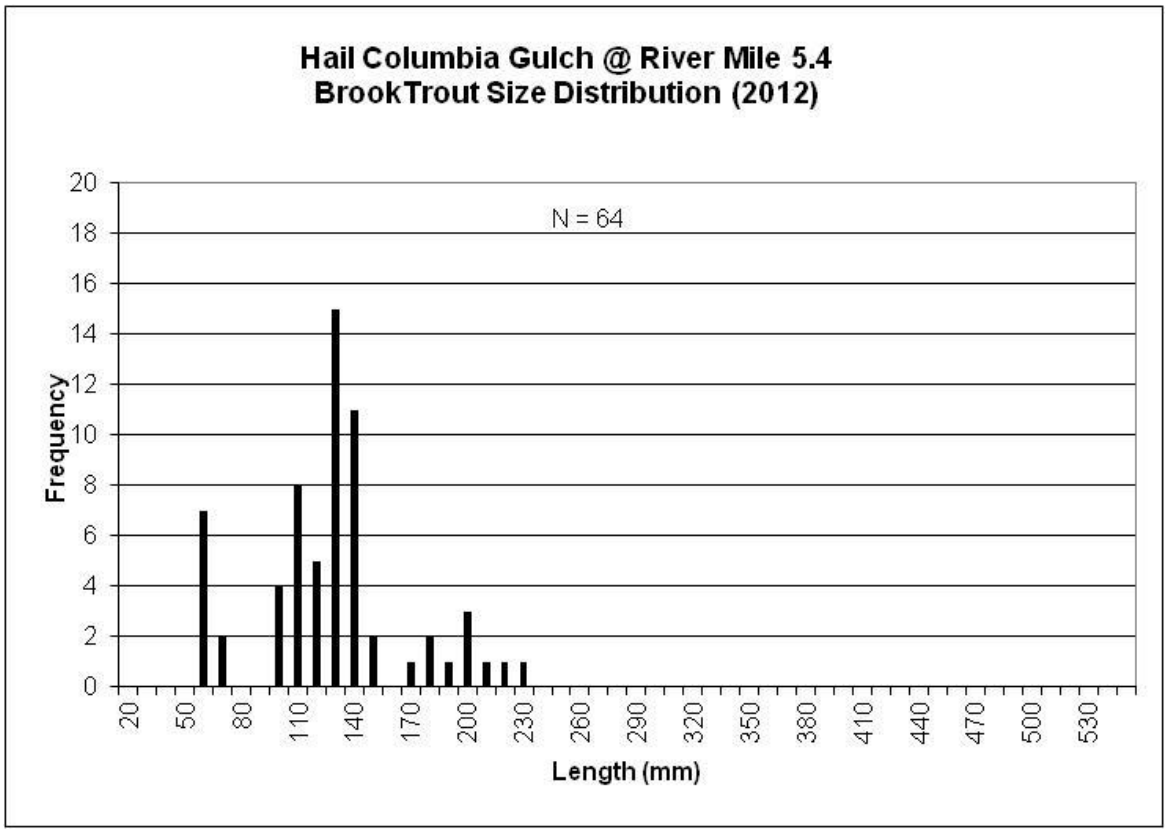
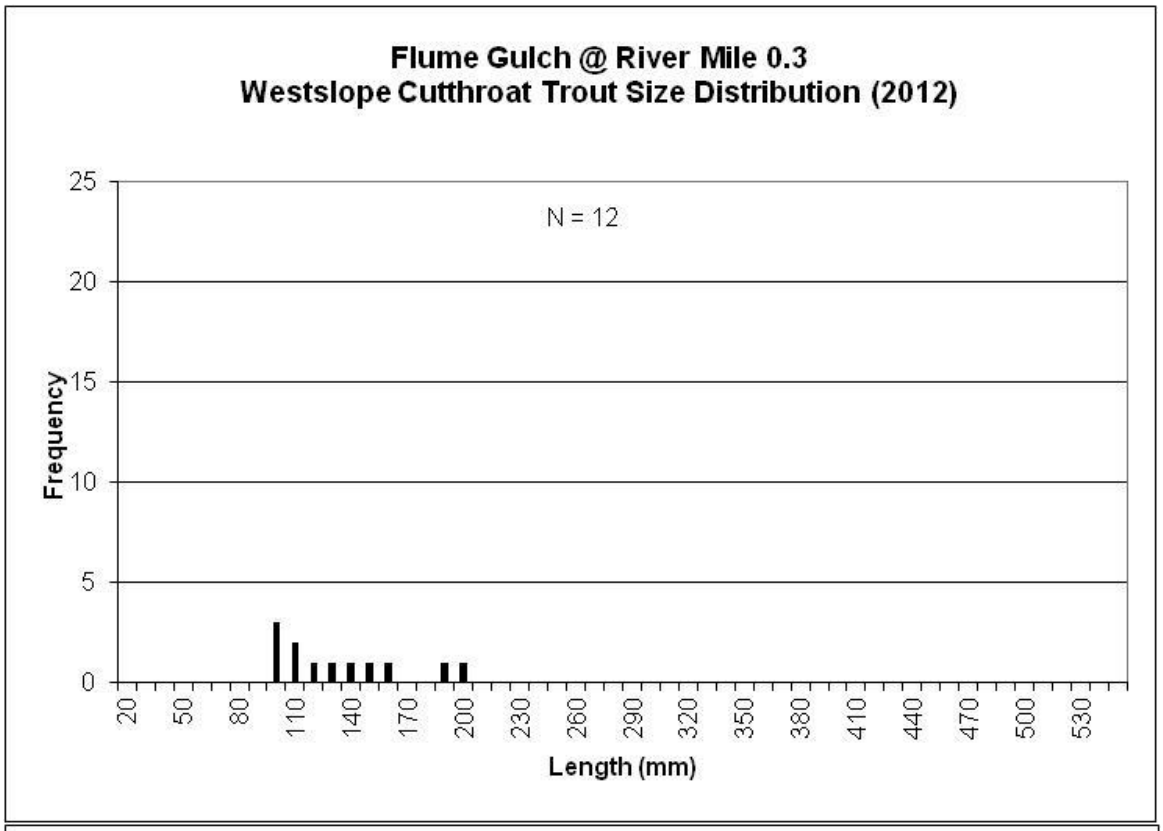
380
410
440
470
500
530

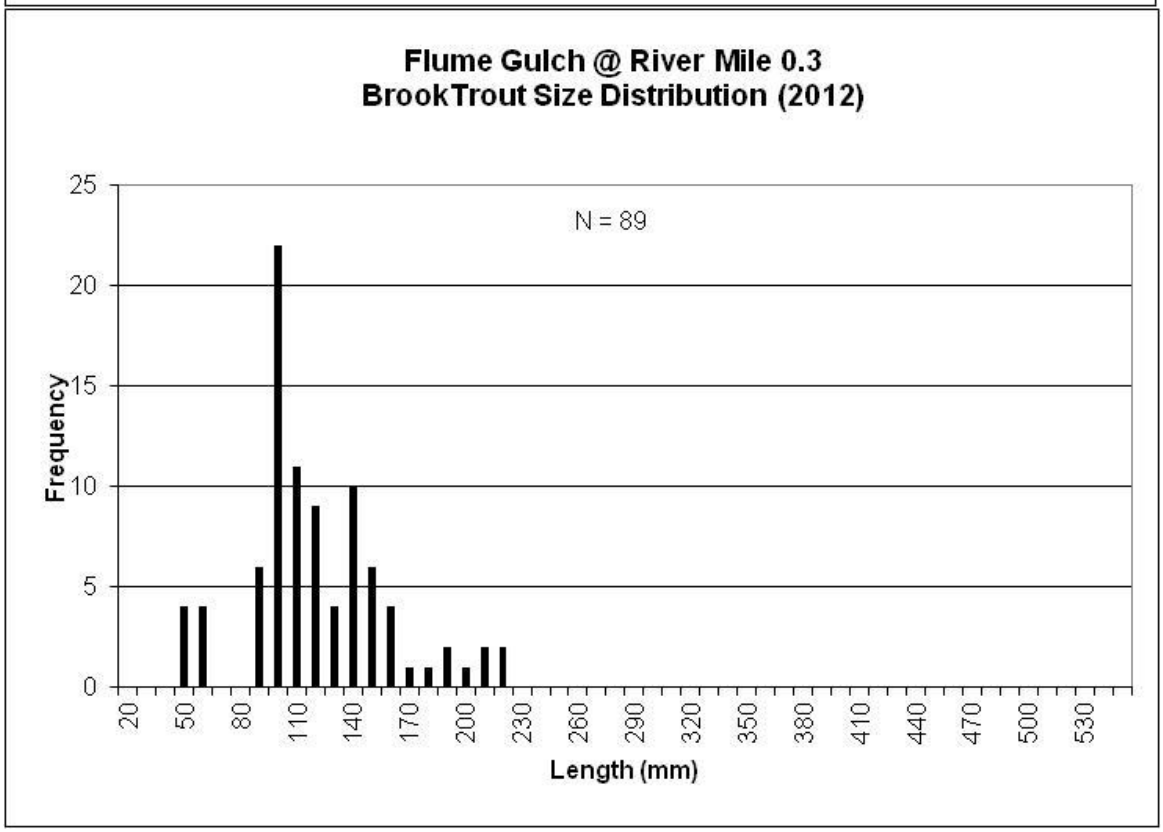

Browns Gulch @ River Mile 16.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 3
Frequency
Length (mm)

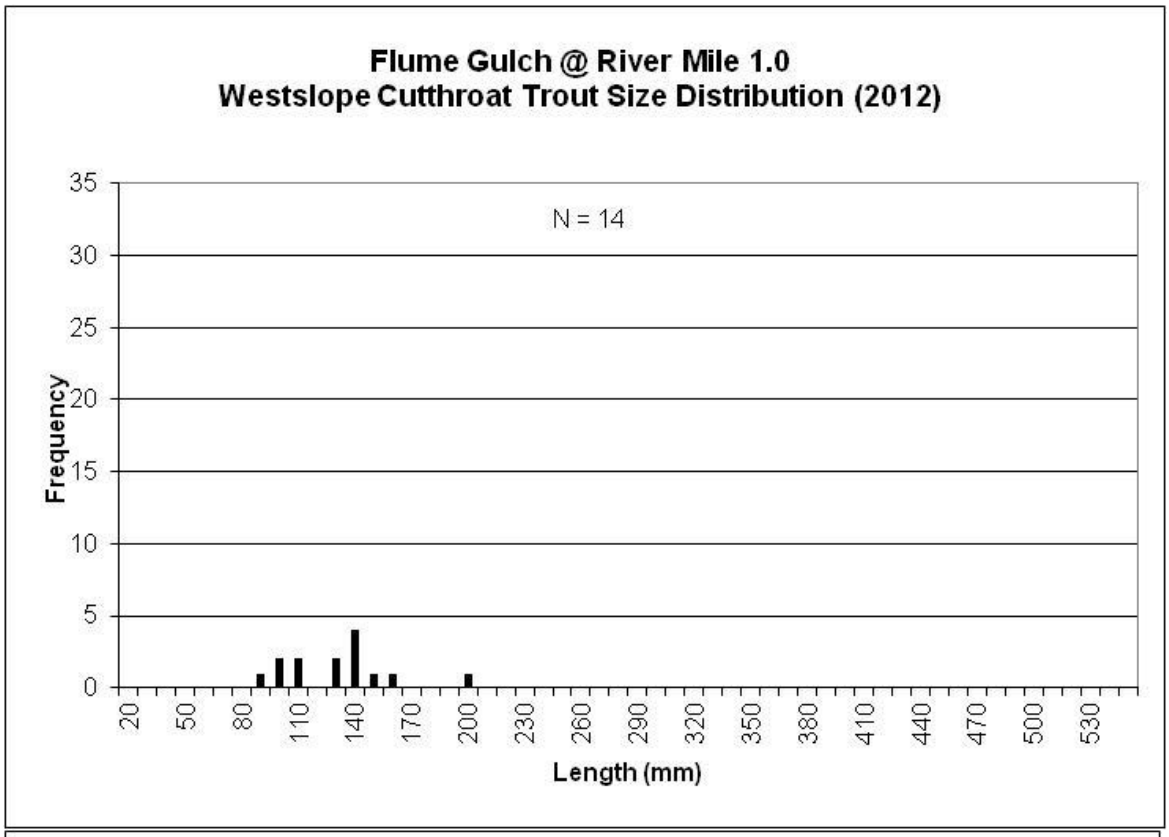

Browns Gulch @ River Mile 16.5
Brook Trout Size Distribution (2012)
N = 60
Frequency
Length (mm)

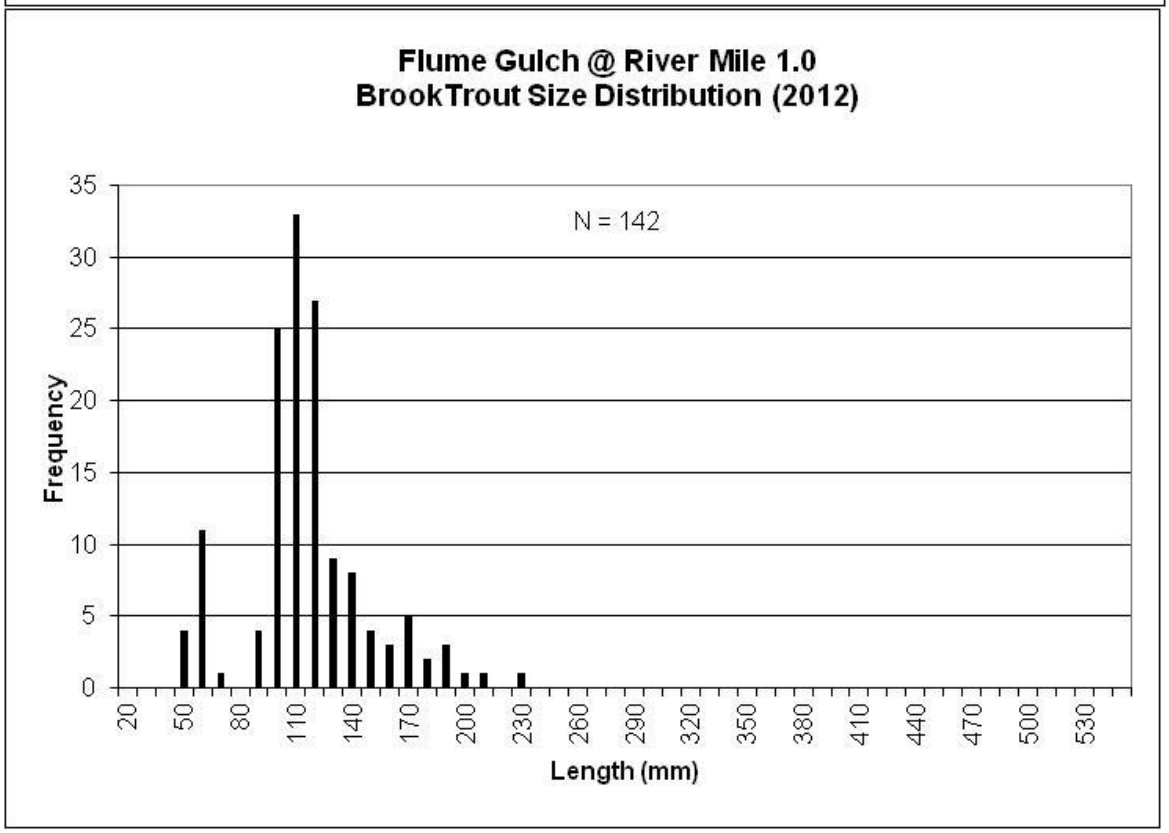

Hail Columbia Gulch @ River Mile 4.0
BrookTrout Size Distribution (2012)
N = 106
Frequency
Length (mm)
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530

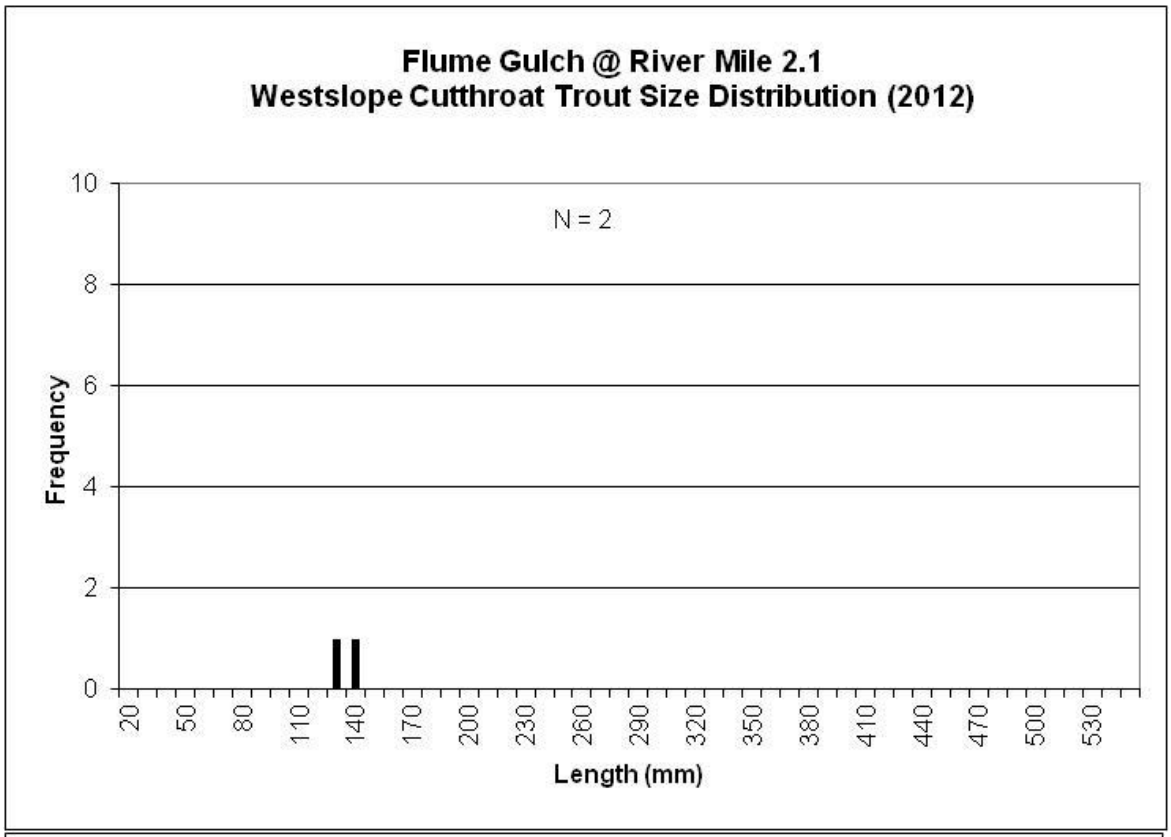

Hail Columbia Gulch @ River Mile 5.4
BrookTrout Size Distribution (2012)
N = 64
Frequency
0
2
4
6
8
10
12
14
16
18
20
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

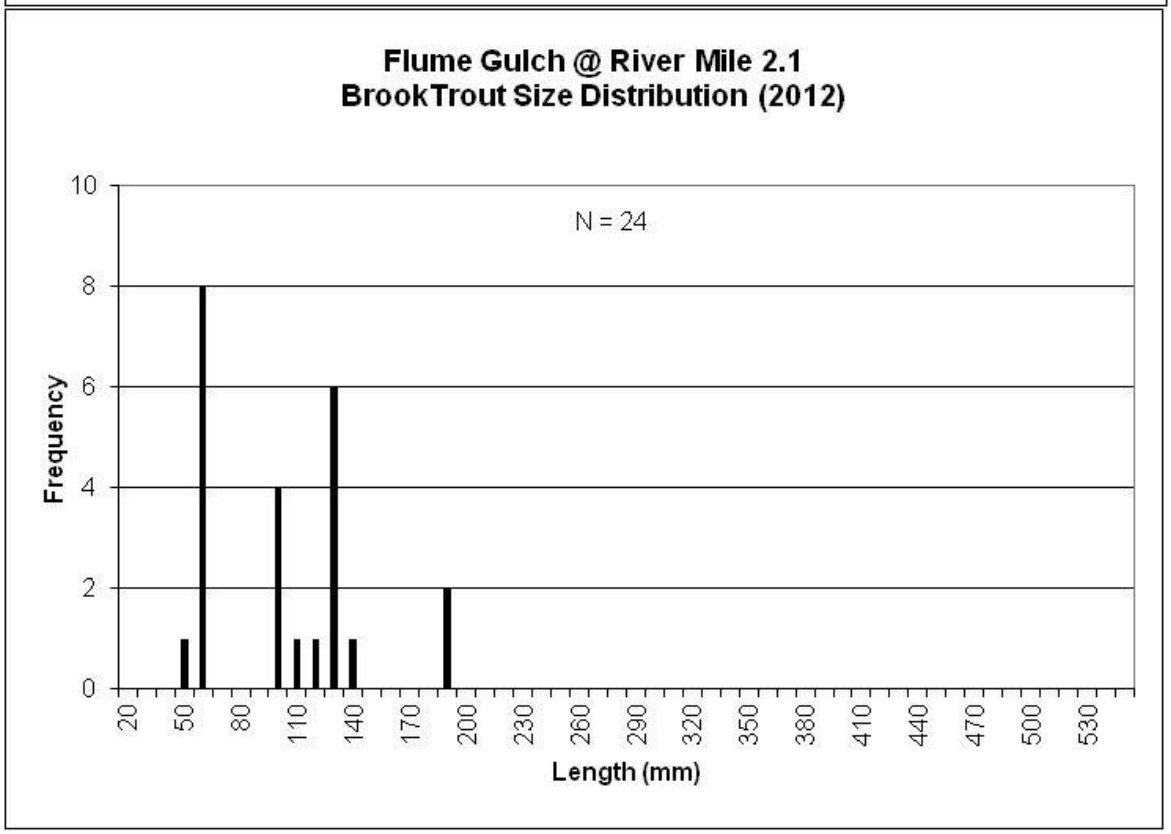

Flume Gulch @ River Mile 0.3
Westslope Cutthroat Trout Size Distribution (2012)
N = 12
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

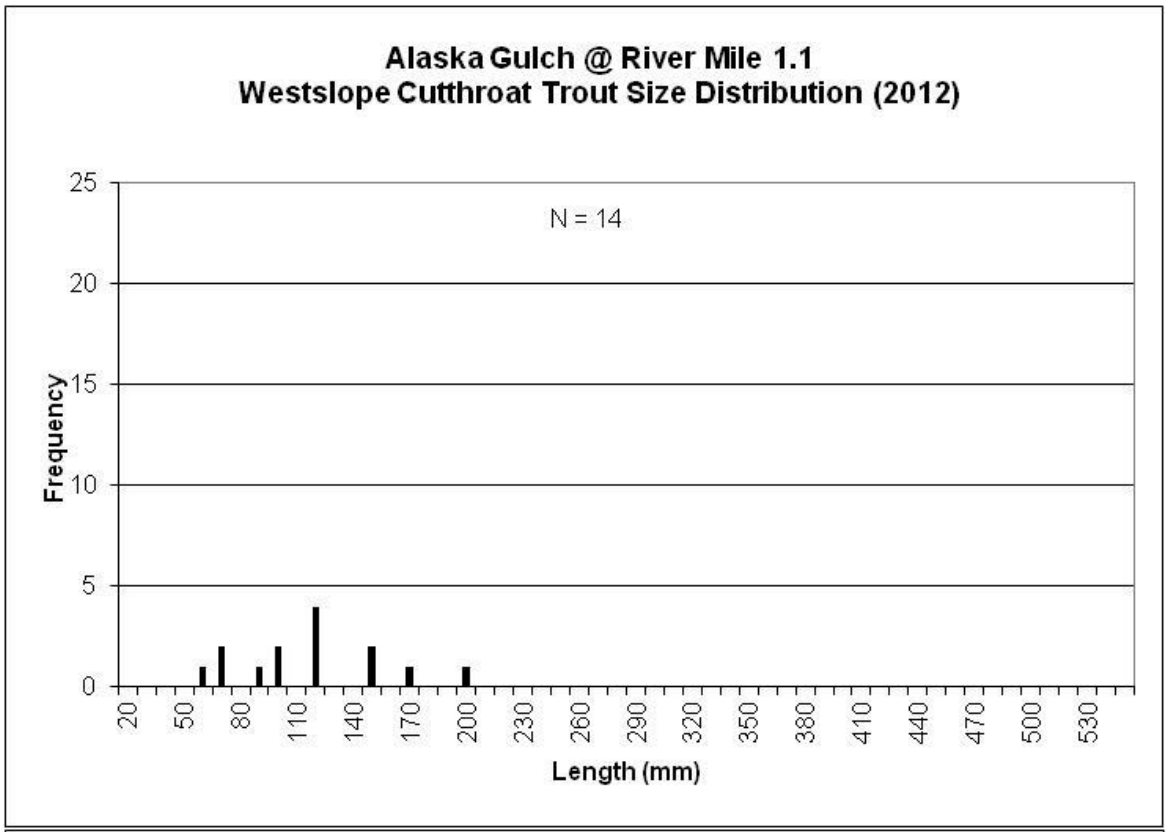

Flume Gulch @ River Mile 0.3
BrookTrout Size Distribution (2012)
N = 89
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

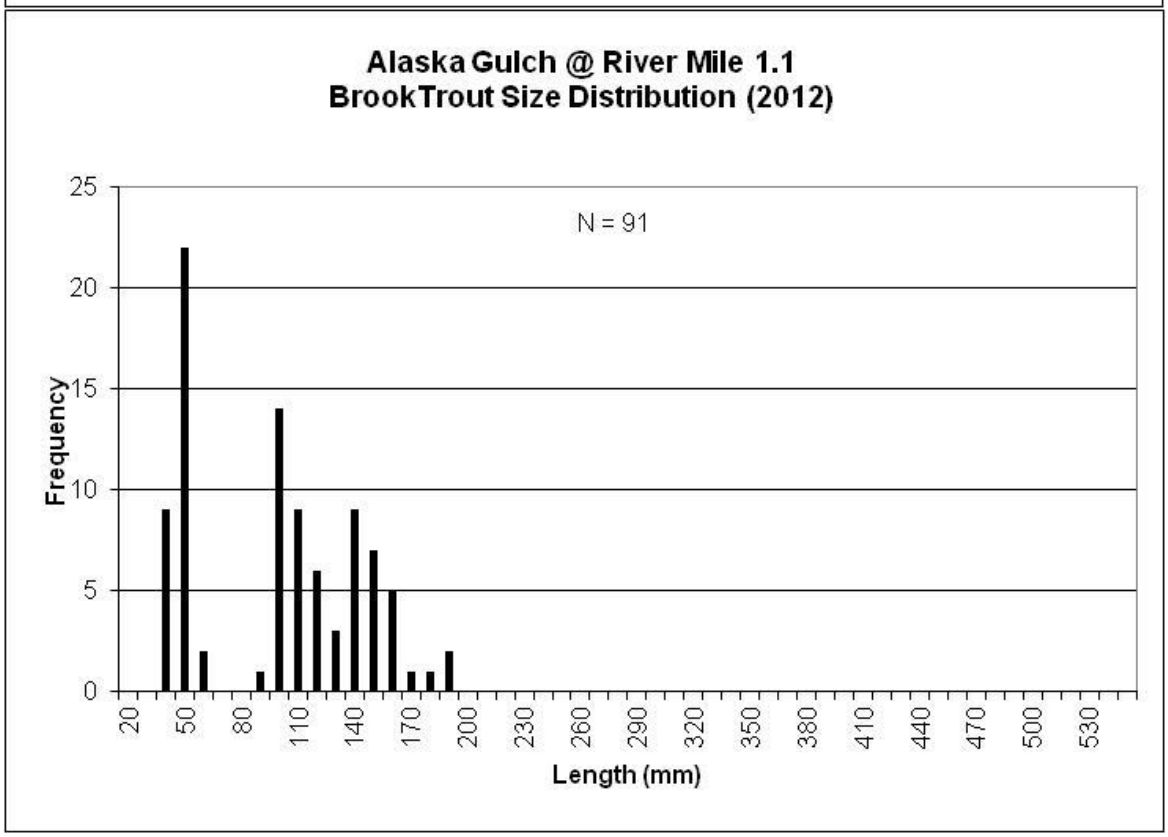

Flume Gulch @ River Mile 1.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 14
Frequency
0
5
10
15
20
25
30
35
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

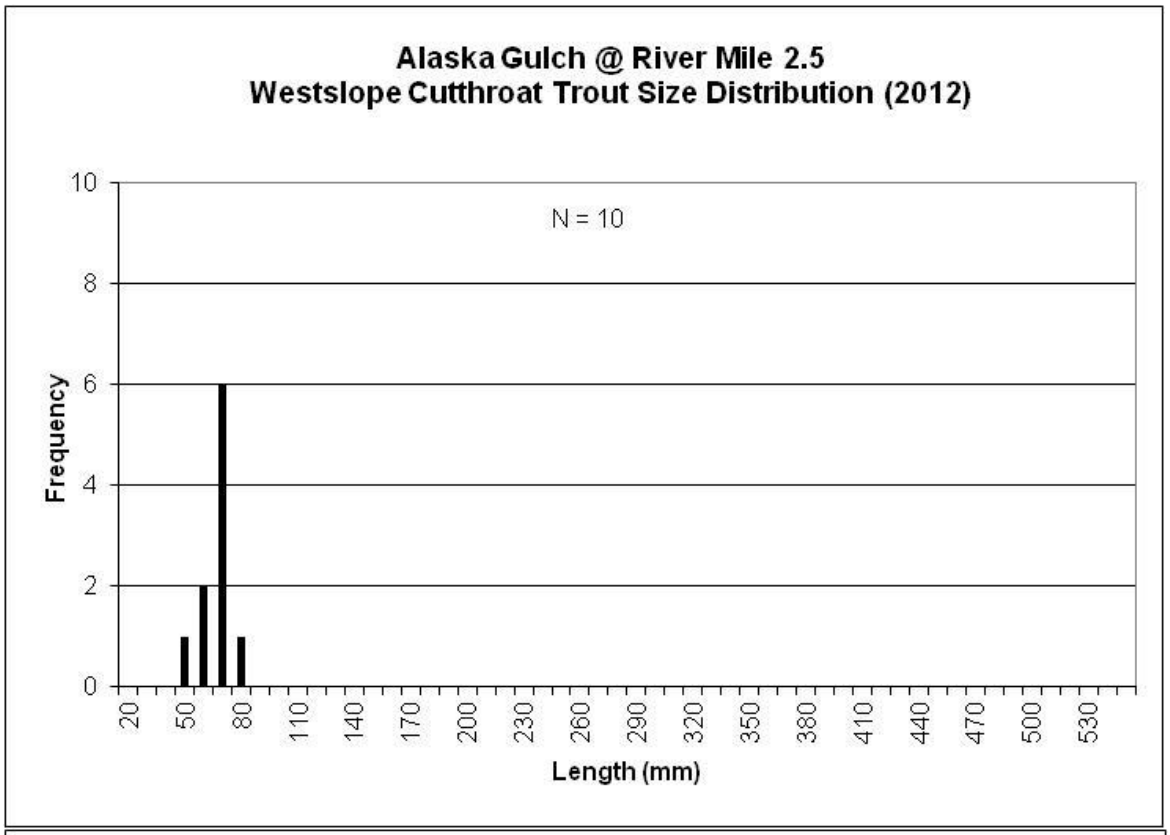

Flume Gulch @ River Mile 1.0
BrookTrout Size Distribution (2012)
N = 142
Frequency
0
5
10
15
20
25
30
35
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

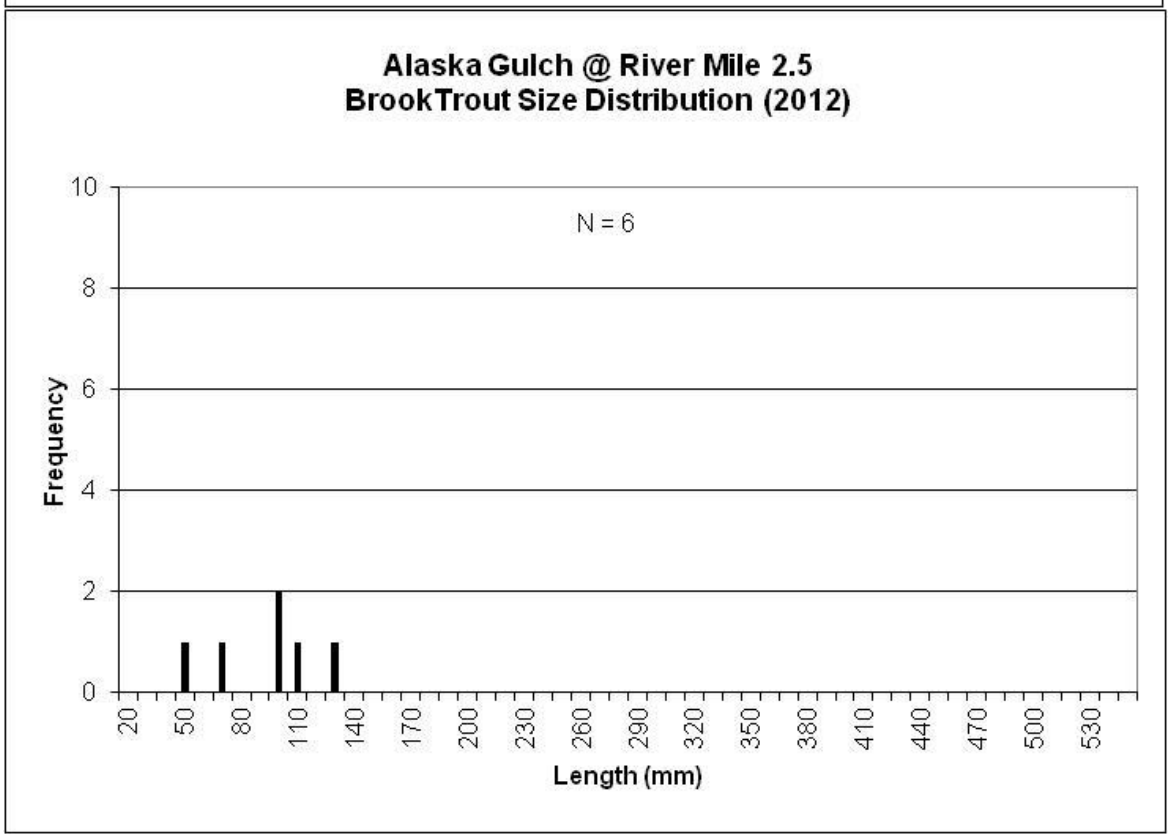

Flume Gulch @ River Mile 2.1
Westslope Cutthroat Trout Size Distribution (2012)
N = 2
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

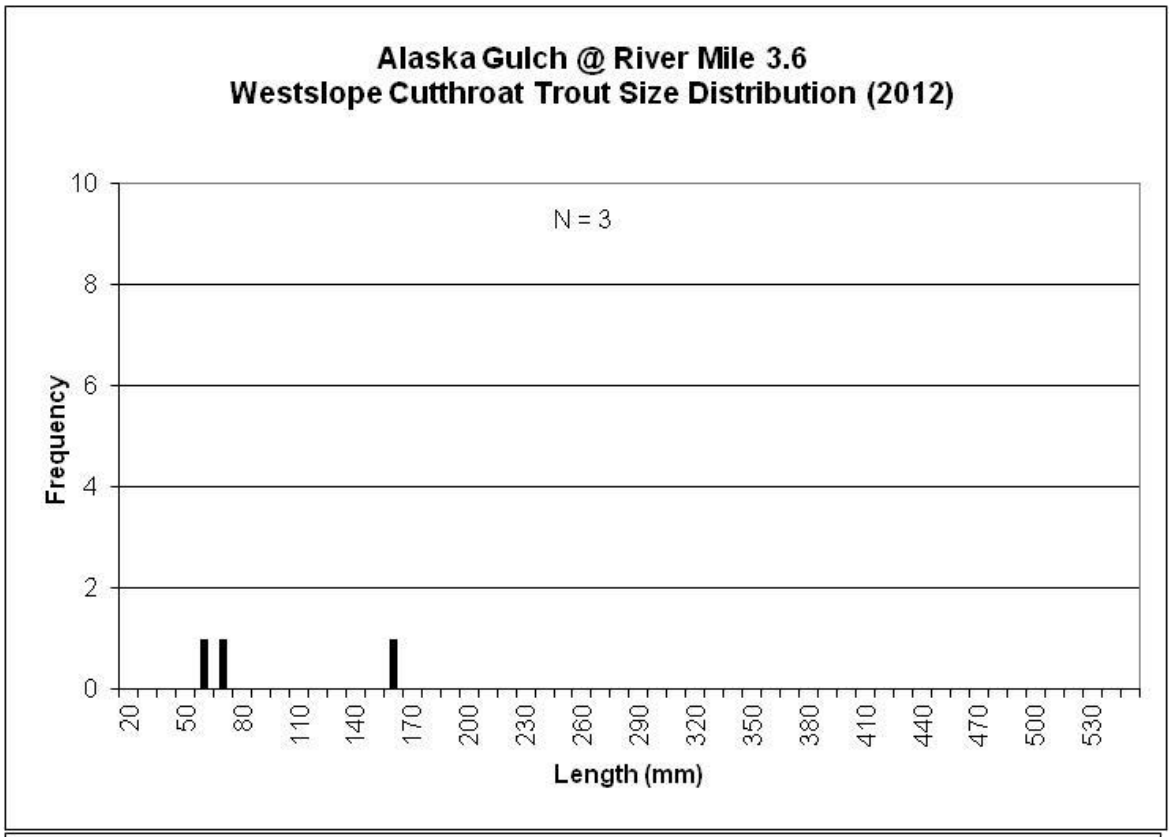

Flume Gulch @ River Mile 2.1
BrookTrout Size Distribution (2012)
N = 24
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

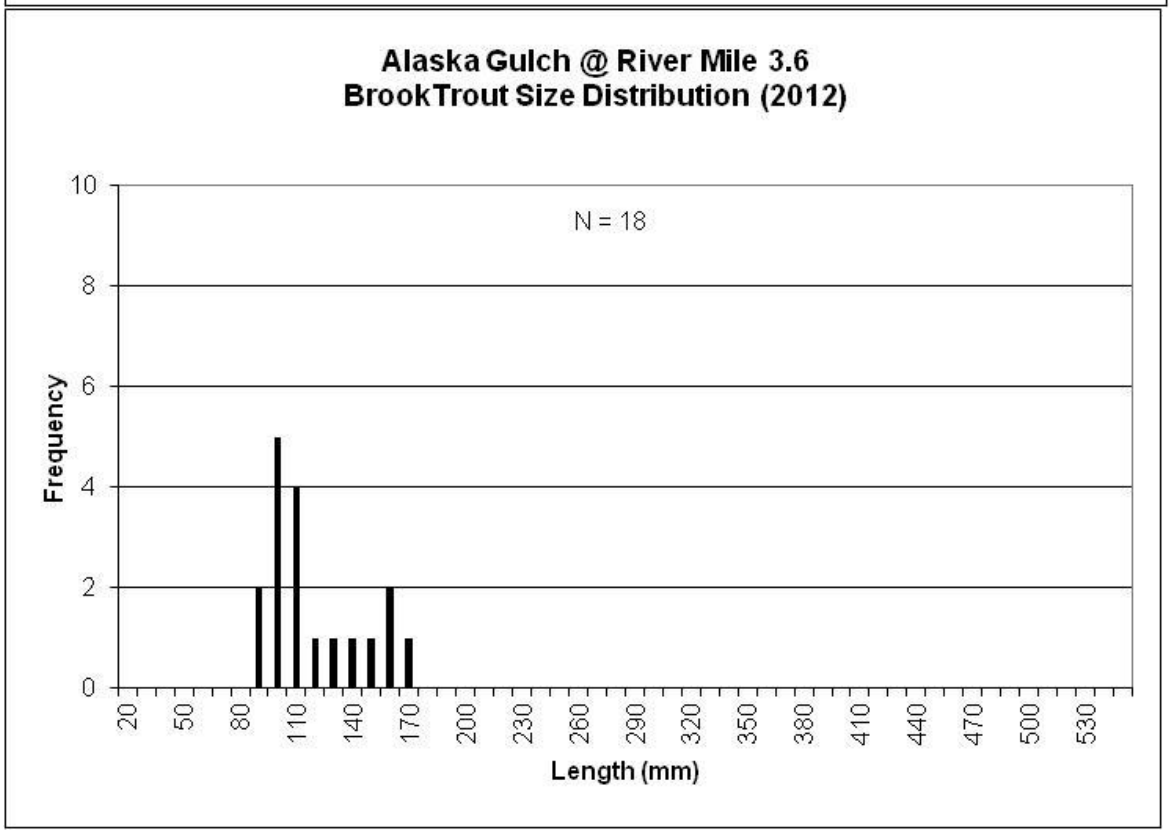

Alaska Gulch @ River Mile 1.1
Westslope Cutthroat Trout Size Distribution (2012)
N = 14
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

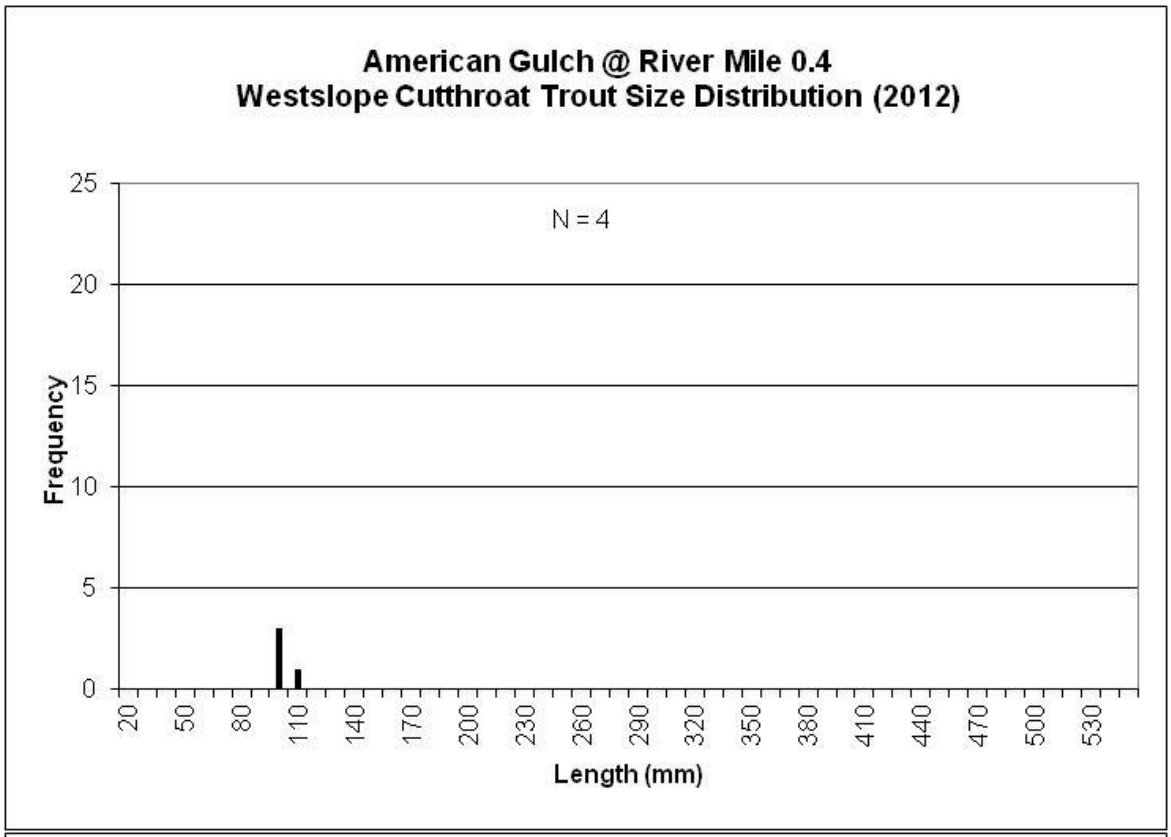

Alaska Gulch @ River Mile 1.1
BrookTrout Size Distribution (2012)
N = 91
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

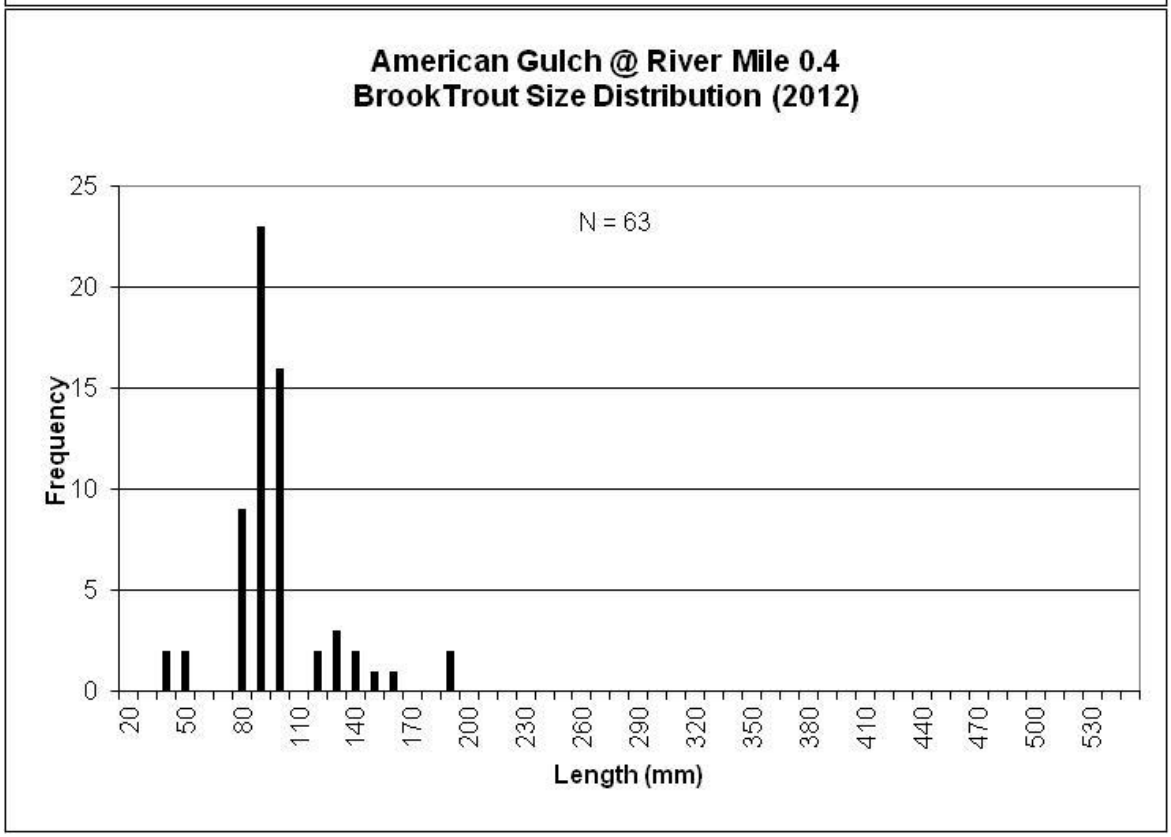

Alaska Gulch @ River Mile 2.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 10
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

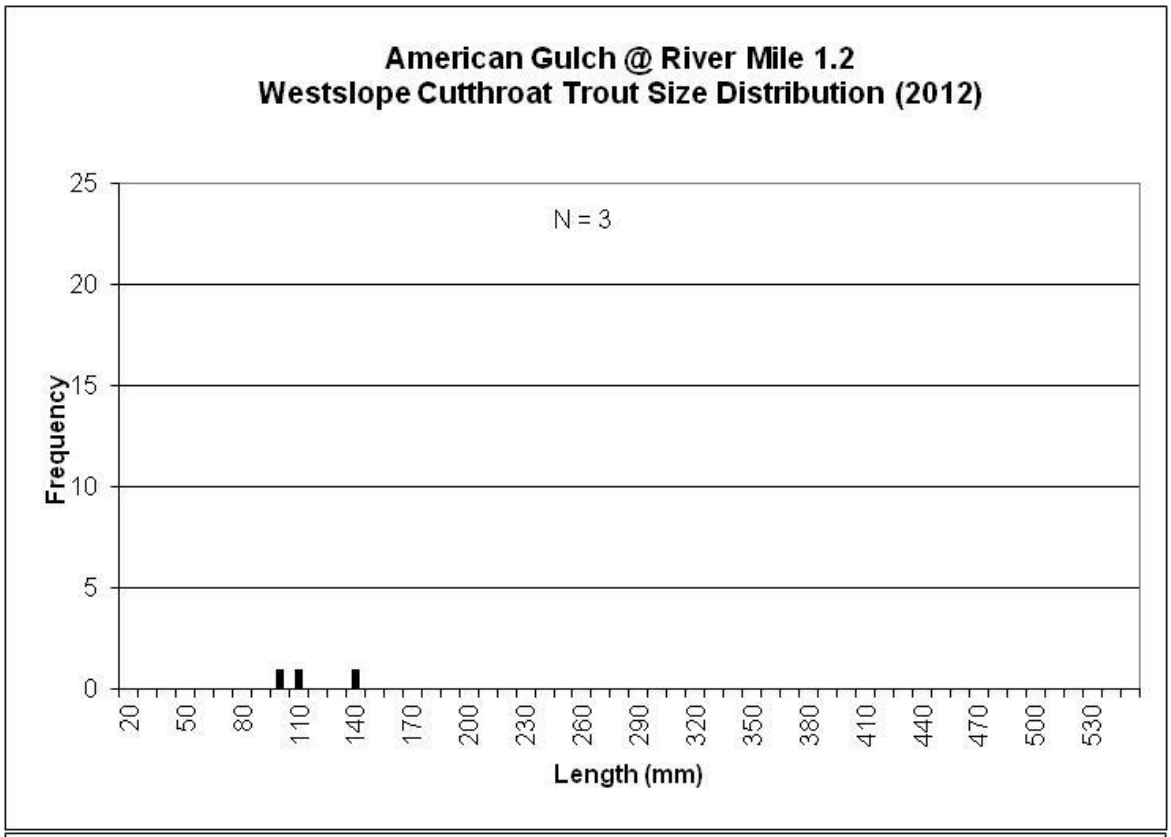

Alaska Gulch @ River Mile 2.5
BrookTrout Size Distribution (2012)
N = 6
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

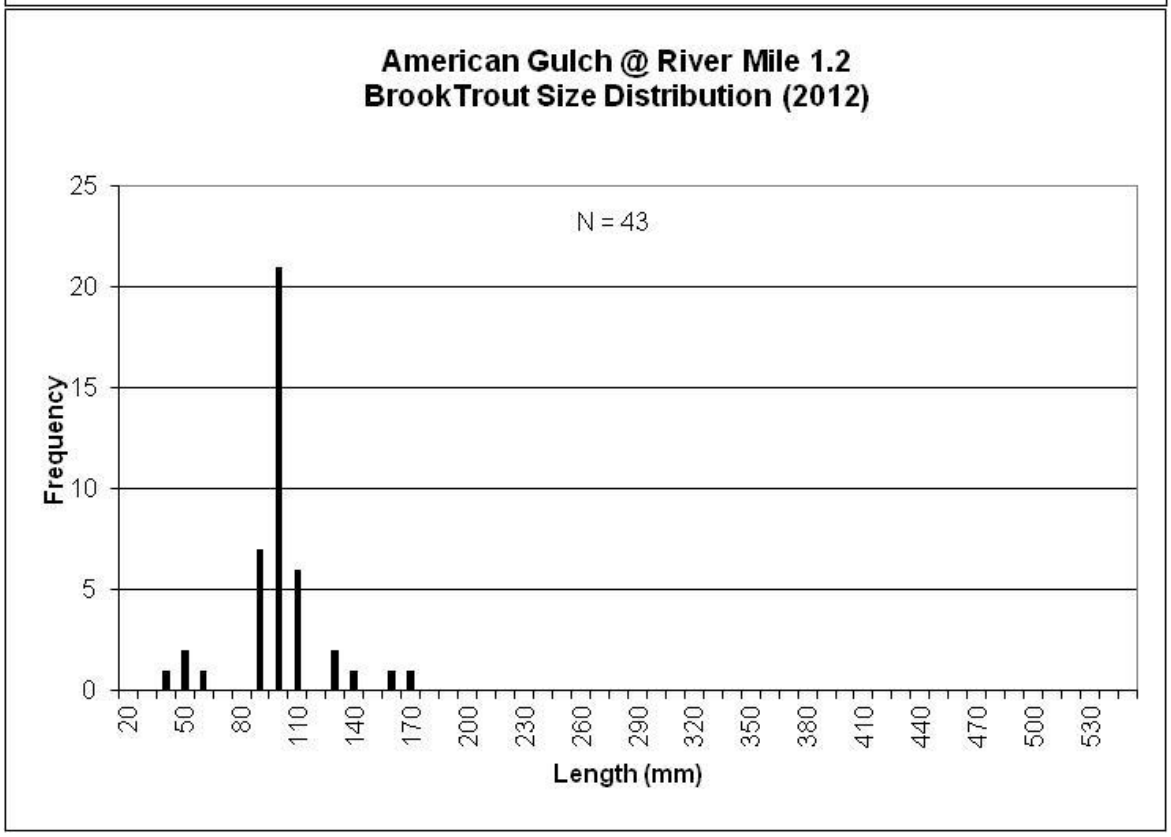

Alaska Gulch @ River Mile 3.6
Westslope Cutthroat Trout Size Distribution (2012)
N = 3
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

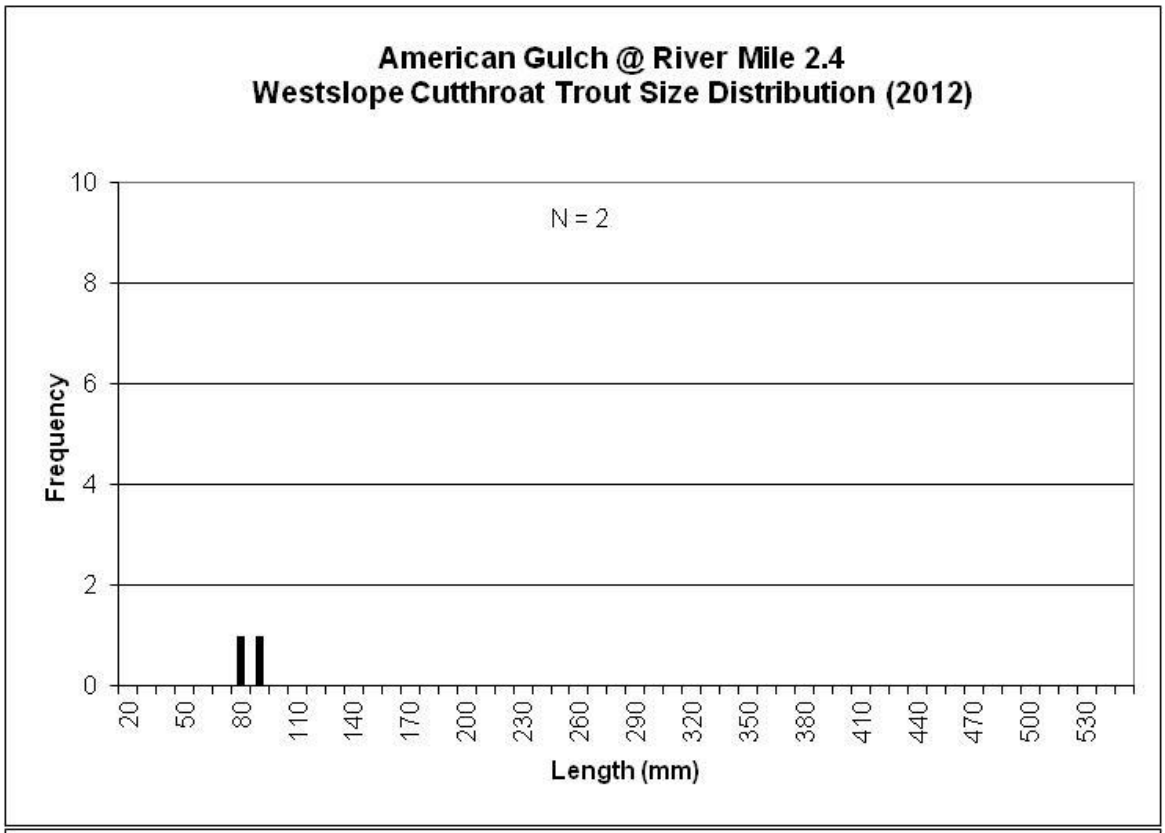

Alaska Gulch @ River Mile 3.6
BrookTrout Size Distribution (2012)
N = 18
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

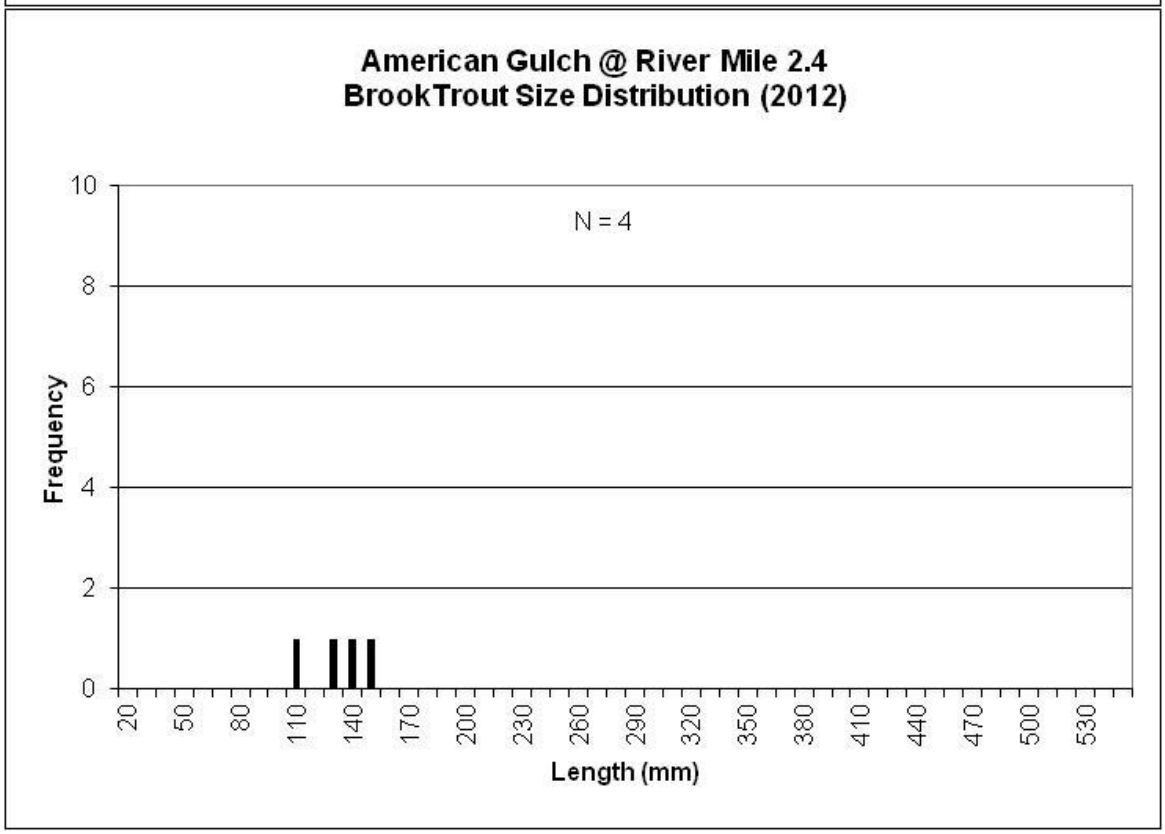

American Gulch @ River Mile 0.4
Westslope Cutthroat Trout Size Distribution (2012)
N = 4
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

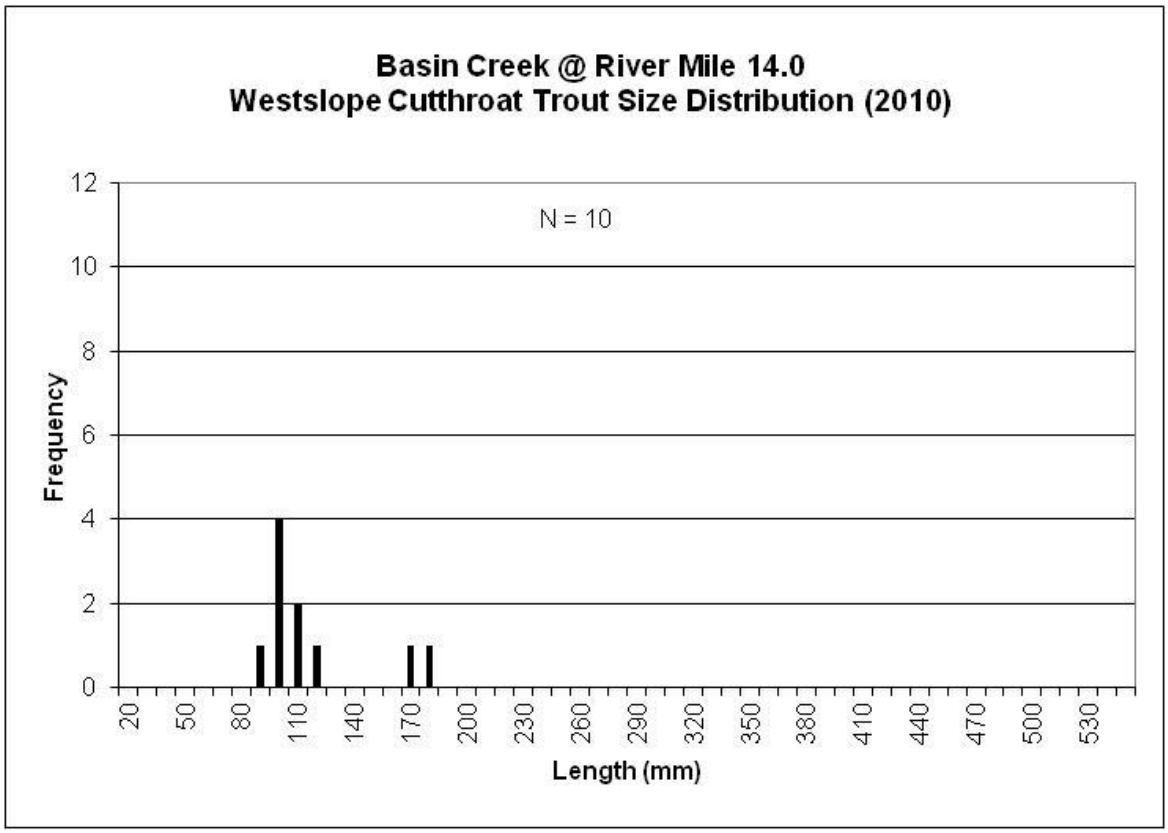

American Gulch @ River Mile 0.4
BrookTrout Size Distribution (2012)
N = 63
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

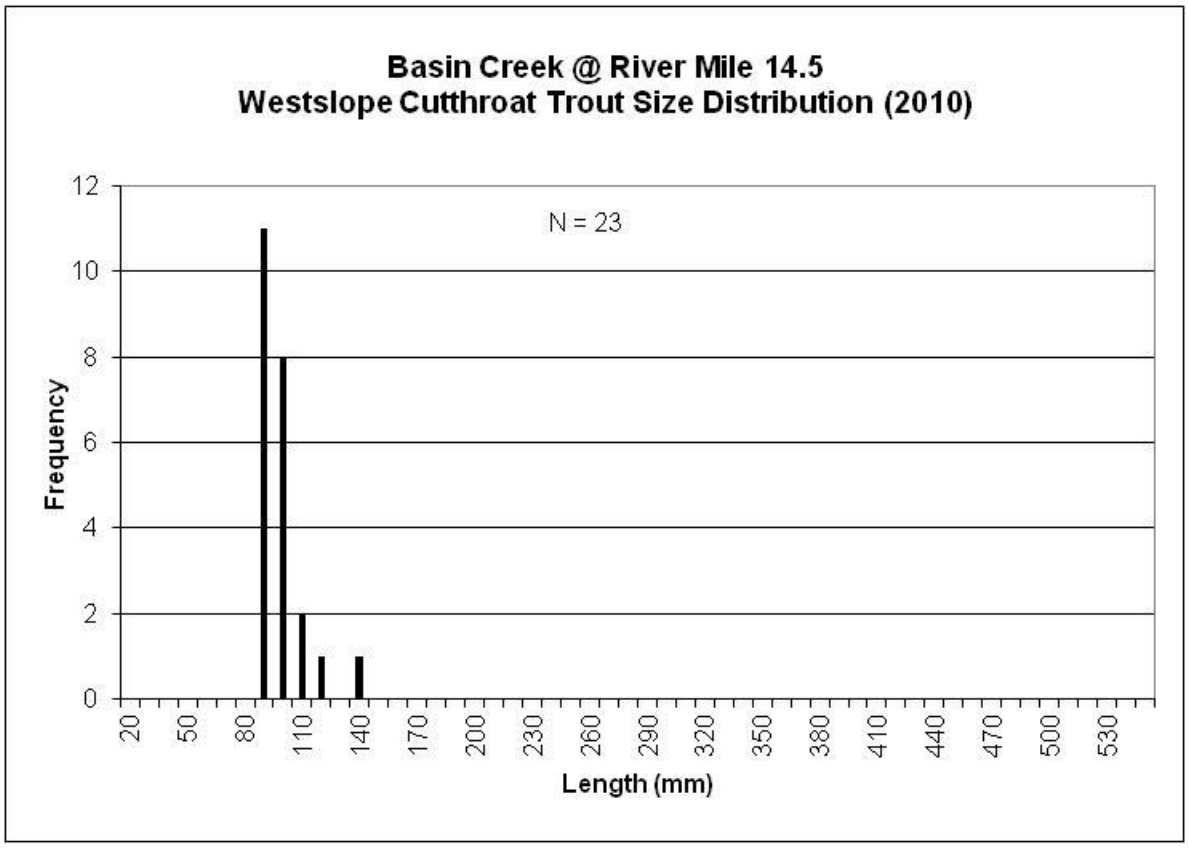

American Gulch @ River Mile 1.2
Westslope Cutthroat Trout Size Distribution (2012)
N = 3
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

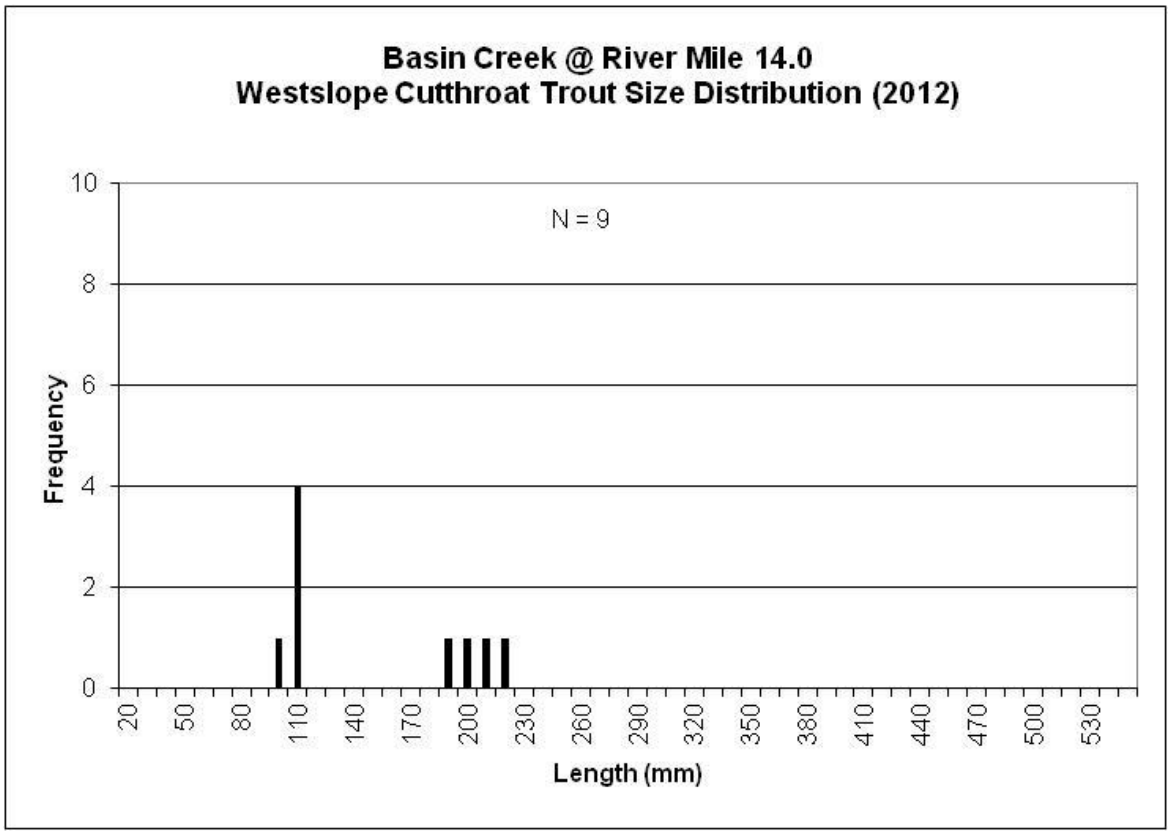

American Gulch @ River Mile 1.2
BrookTrout Size Distribution (2012)
N = 43
Frequency
0
5
10
15
20
25
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

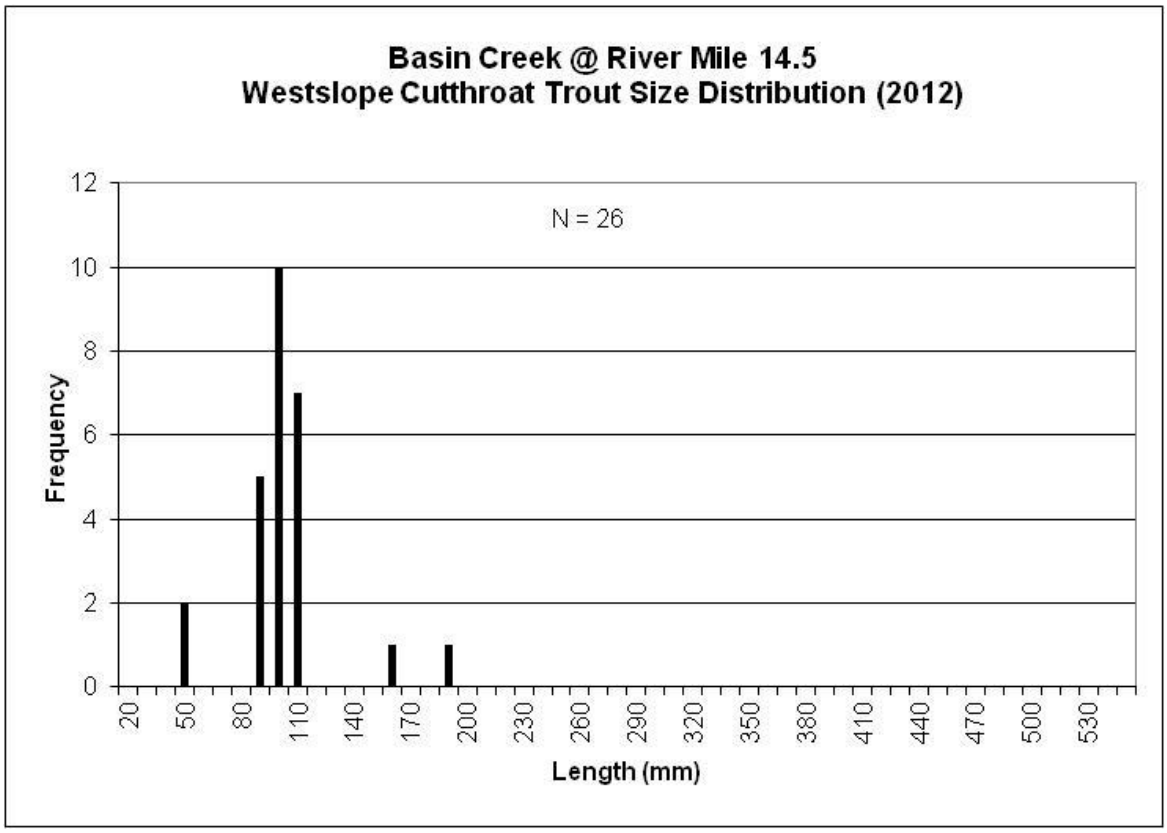

American Gulch @ River Mile 2.4
Westslope Cutthroat Trout Size Distribution (2012)
N = 2
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

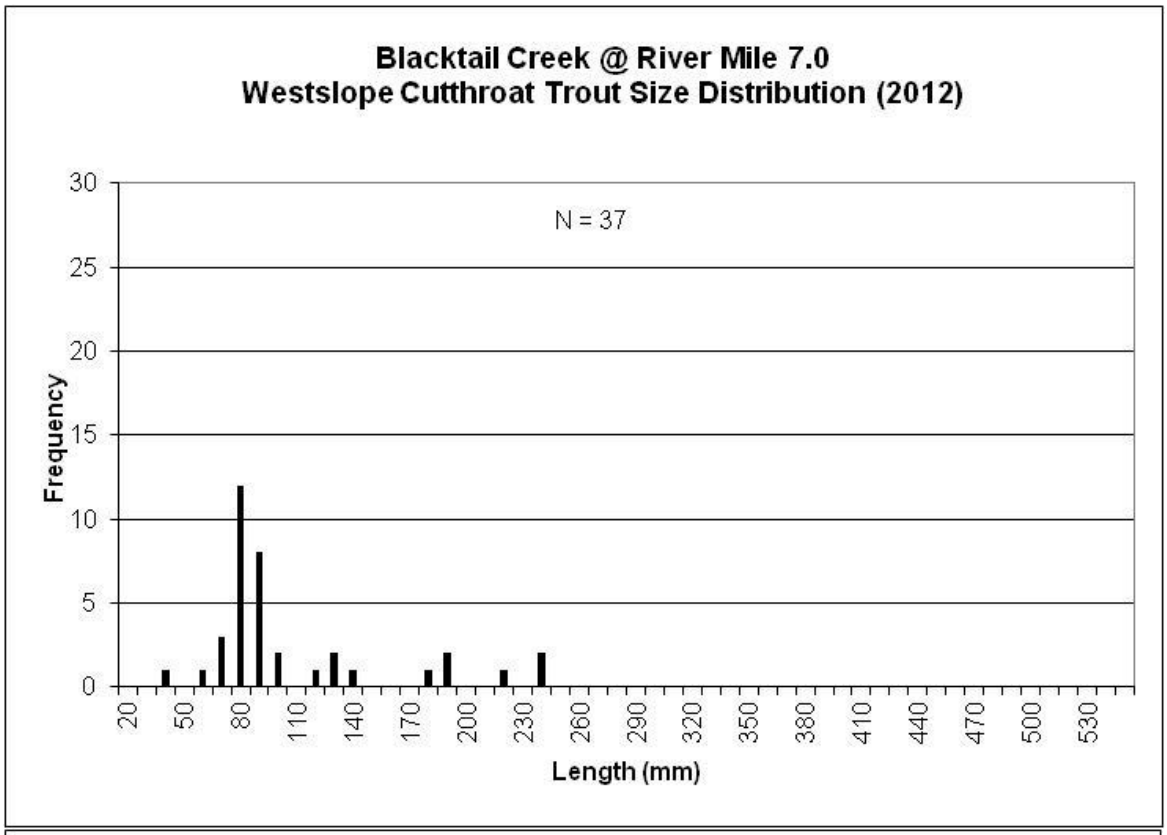

American Gulch @ River Mile 2.4
BrookTrout Size Distribution (2012)
N = 4
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

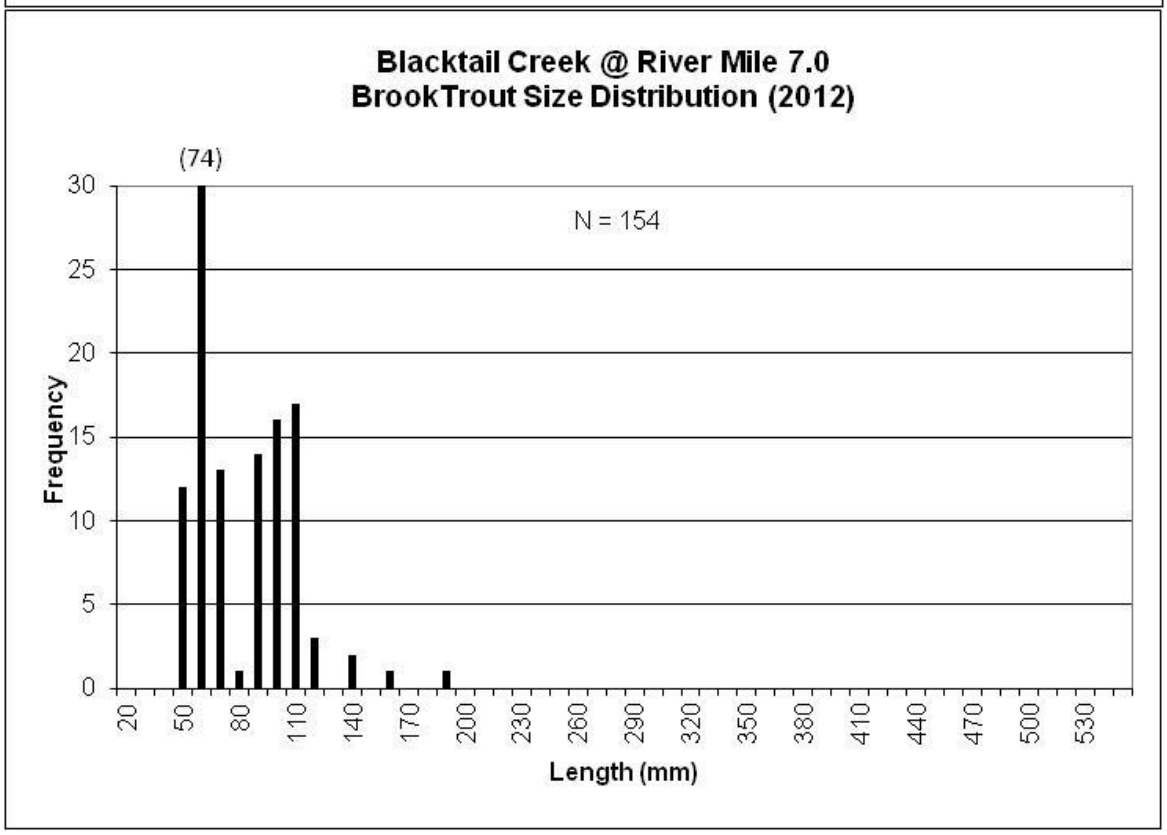

Basin Creek @ River Mile 14.0
Westslope Cutthroat Trout Size Distribution (2010)
N = 10
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

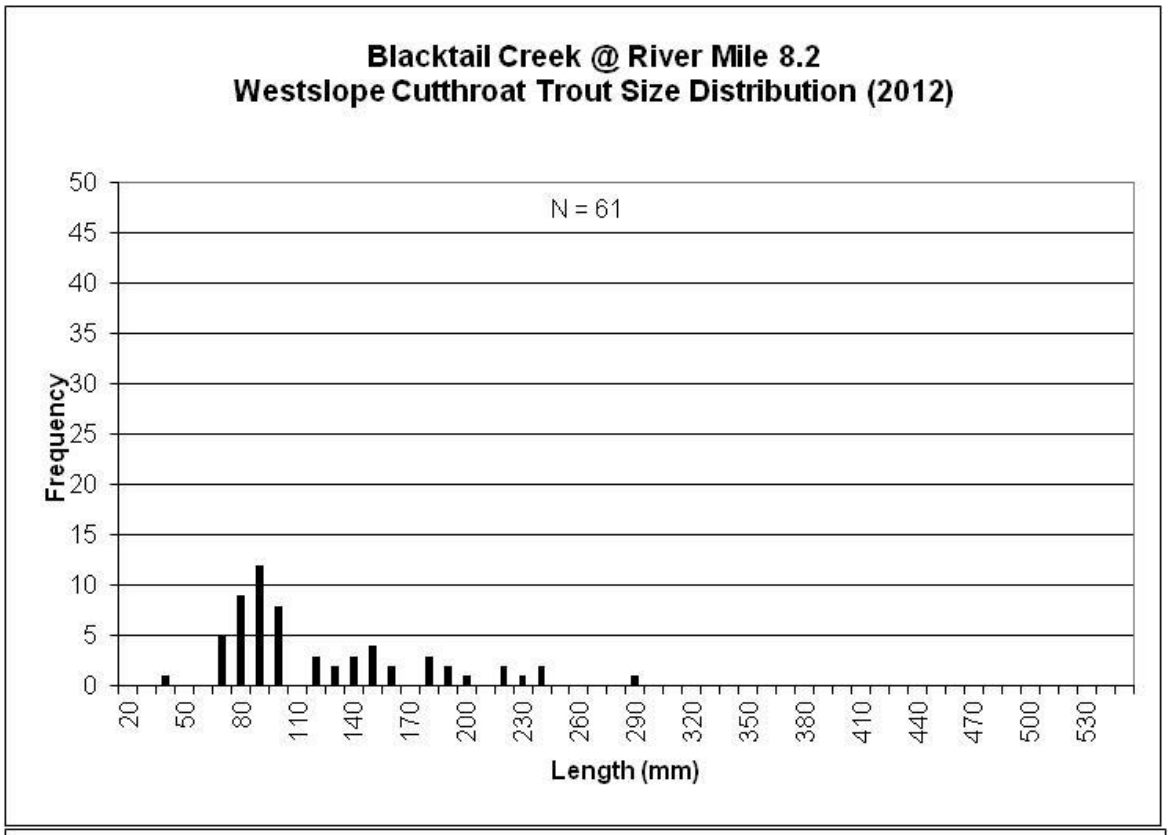

Basin Creek @ River Mile 14.5
Westslope Cutthroat Trout Size Distribution (2010)
N = 23
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

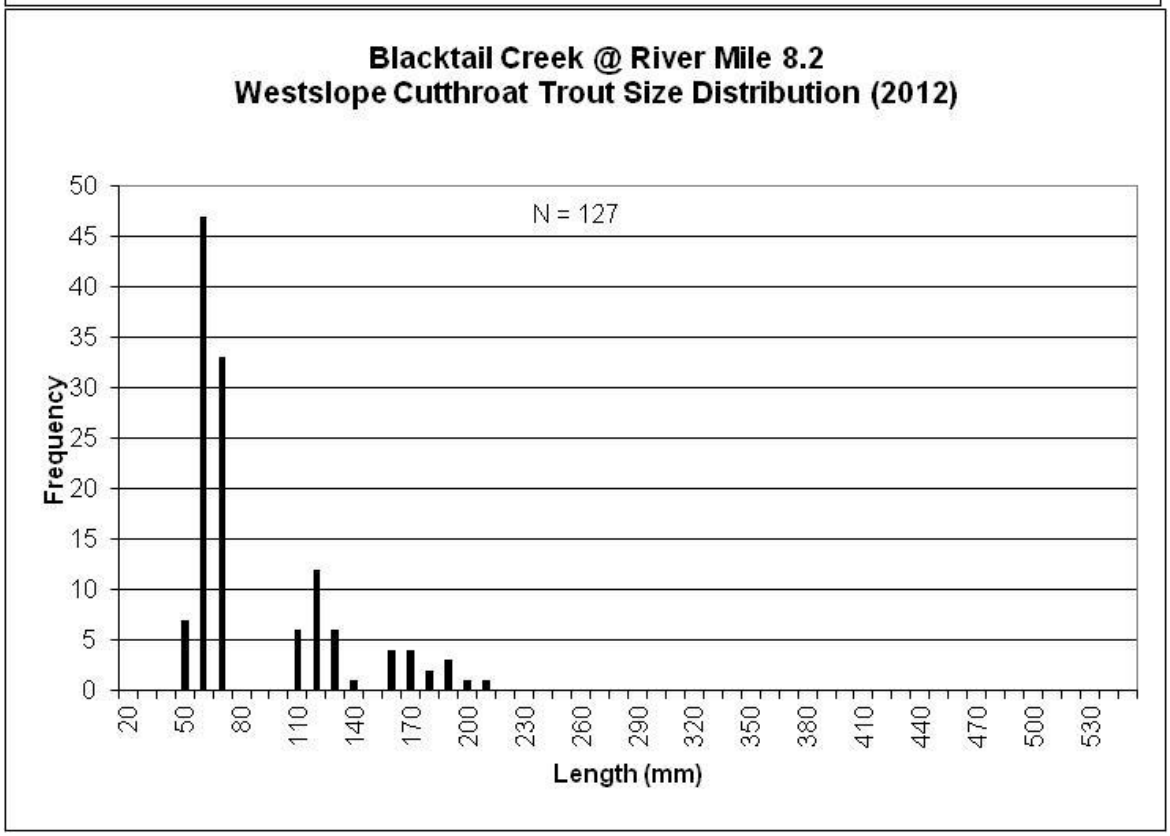

Basin Creek @ River Mile 14.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 9
Frequency
0
2
4
6
8
10
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

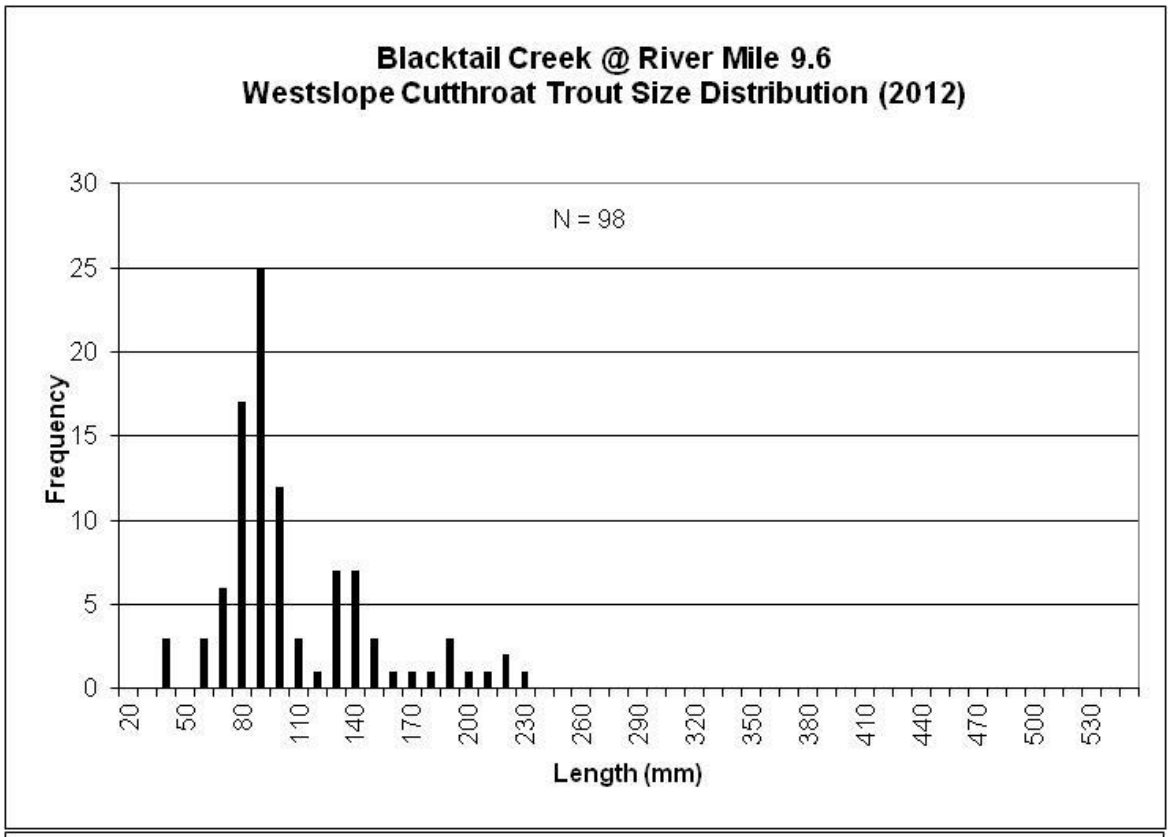

Basin Creek @ River Mile 14.5
Westslope Cutthroat Trout Size Distribution (2012)
N = 26
Frequency
0
2
4
6
8
10
12
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

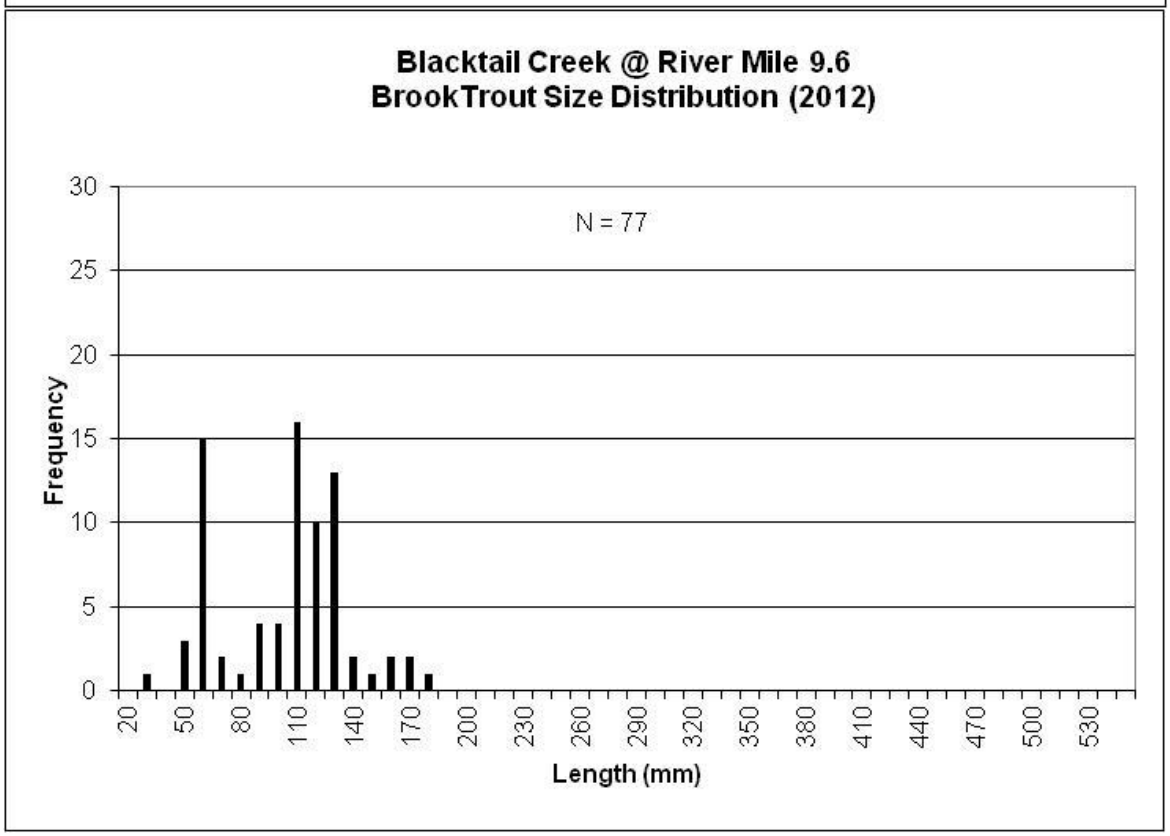

Blacktail Creek @ River Mile 7.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 37
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

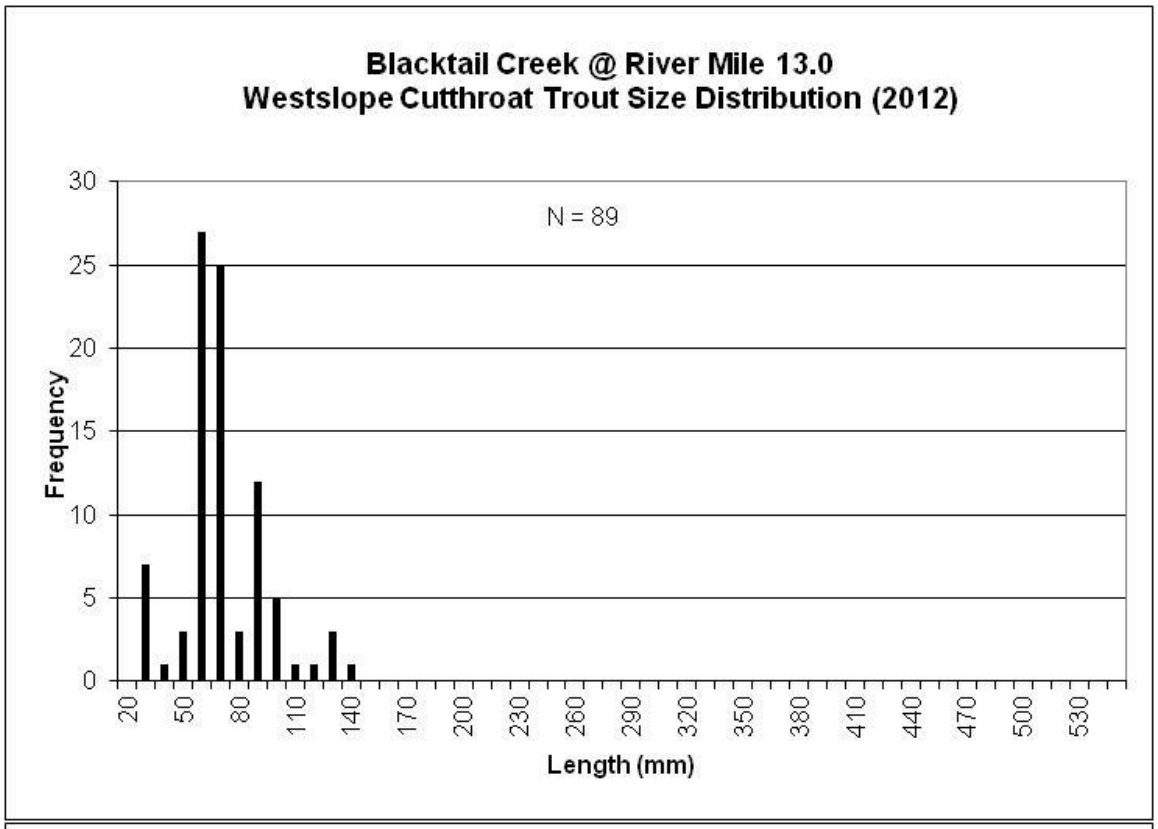

Blacktail Creek @ River Mile 7.0
BrookTrout Size Distribution (2012)
(74)
N = 154
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)

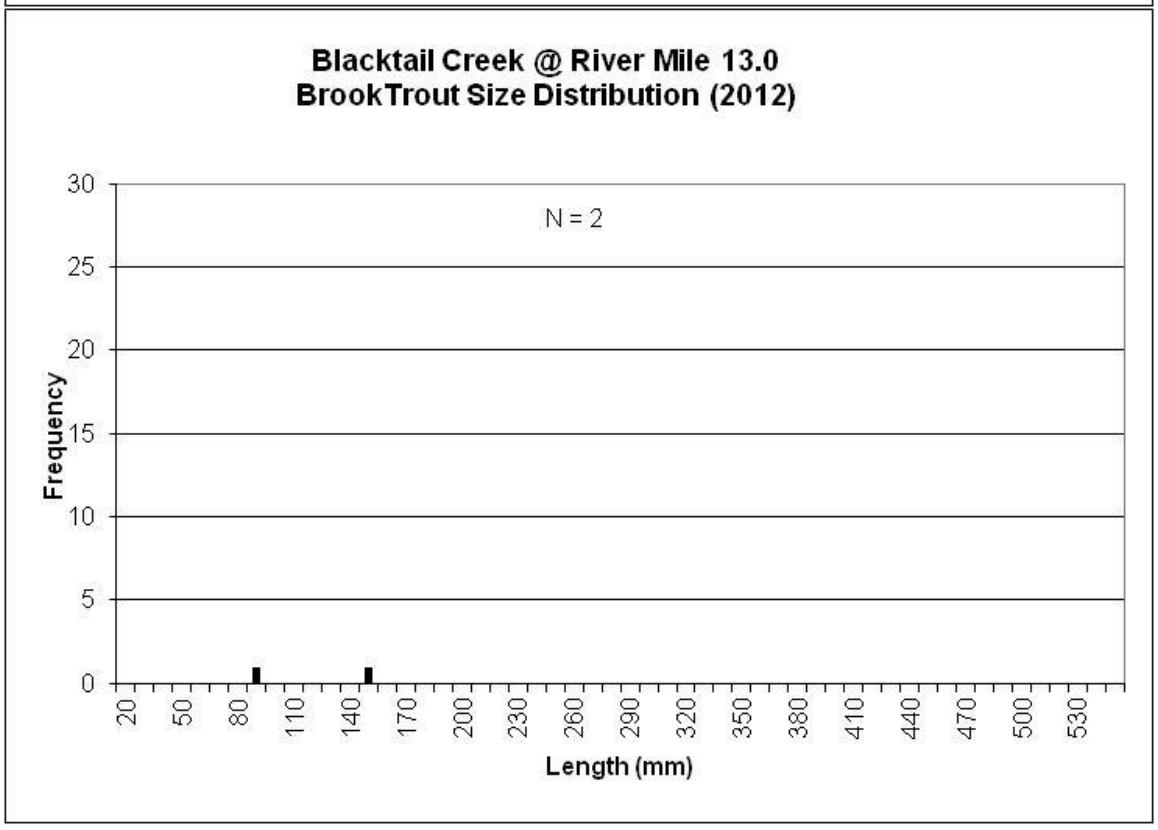

Blacktail Creek @ River Mile 8.2
Westslope Cutthroat Trout Size Distribution (2012)
N = 61
Frequency
Length (mm)
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Blacktail Creek @ River Mile 8.2
Westslope Cutthroat Trout Size Distribution (2012)
N = 127
Frequency
Length (mm)
0
5
10
15
20
25
30
35
40
45
50
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530


Blacktail Creek @ River Mile 9.6
Westslope Cutthroat Trout Size Distribution (2012)
N = 98
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Blacktail Creek @ River Mile 9.6
BrookTrout Size Distribution (2012)
N = 77
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Blacktail Creek @ River Mile 13.0
Westslope Cutthroat Trout Size Distribution (2012)
N = 89
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)


Blacktail Creek @ River Mile 13.0
BrookTrout Size Distribution (2012)
N = 2
Frequency
0
5
10
15
20
25
30
20
50
80
110
140
170
200
230
260
290
320
350
380
410
440
470
500
530
Length (mm)