

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Spearfish Creek, Lawrence County
09-0021-00
1993

Table 1. Population and Biomass Estimates for Spearfish Creek

Site Number: 174	Date Sampled: 10/06/1993	Conductivity (umhos/cm): 292
Site Midpoint (Latitude, Longitude): 44.50196266, -103.86743501	Site Length (m): 100	pH:
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 5.3	Water Temperature (C): 8.0
Stream Classification: BR1	Number of Pass: 3	Voltage: 350

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	34	41	54	34	768	30	410	311	26.74	660	143.2	39.0
Brown Trout	>=200mm	48	49	52	48	918	208	490	372	185.88	788	273.6	226.9
Brown Trout	All	82	88	96	82	1648	246	880	667	219.20	1416	219.5	149.0

Site Number: 190	Date Sampled: 10/05/1993	Conductivity (umhos/cm): 290
Site Midpoint (Latitude, Longitude): 44.48929462, -103.86435821	Site Length (m): 100	pH:
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 8.0	Water Temperature (C): 9.0
Stream Classification: BR1	Number of Pass: 3	Voltage: 300

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	58	62	69	58	779	29	620	315	25.60	998	150.2	36.8
Brown Trout	>=200mm	209	209	211	209	2626	505	2090	1063	450.72	3363	263.4	192.3
Brown Trout	All	267	270	274	267	3392	538	2700	1374	480.00	4344	238.8	158.5

Site Number: 205	Date Sampled: 10/05/1993	Conductivity (umhos/cm): 285
Site Midpoint (Latitude, Longitude): 44.47880965, -103.85669154	Site Length (m): 100	pH:

Survey Completed by: South Dakota Game, Fish and Parks

Mean Width (m): 9.9

Water Temperature (C): 8.0

Stream Classification: BR1

Number of Pass: 3

Voltage: 350

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	68	70	74	68	710	22	700	288	20.03	1126	133.8	31.6
Brown Trout	>=200mm	98	99	102	98	1004	251	990	407	223.68	1593	284.4	249.5
Brown Trout	All	166	169	173	166	1714	274	1690	694	244.41	2719	222.7	159.7

Site Number: 334

Date Sampled: 10/06/1993

Conductivity (umhos/cm): 282

Site Midpoint (Latitude, Longitude): 44.40606069, -103.89803263

Site Length (m): 123

pH:

Survey Completed by: South Dakota Game, Fish and Parks

Mean Width (m): 9.2

Water Temperature (C): 9.0

Stream Classification: BK3, BR1, RB1

Number of Pass: 3

Voltage: 350

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	1	1	1	1	11	0	8	4	0.06	13	89.0	6.0
Brook Trout	>=200mm	1	1	2	1	11	1	8	4	1.22	13	227.0	126.0
Brook Trout	All	2	2	3	2	22	1	16	9	1.28	26	158.0	66.0
Brown Trout	<200mm	61	64	69	61	696	33	520	282	29.76	837	159.0	47.9
Brown Trout	>=200mm	92	94	98	92	1022	211	764	414	188.77	1230	262.3	206.9
Brown Trout	All	153	158	164	153	1717	246	1285	696	220.09	2067	221.2	143.5
Rainbow Trout	<200mm	25	25	27	25	272	11	203	110	10.23	327	153.6	42.2
Rainbow Trout	>=200mm	54	55	59	54	598	119	447	242	106.42	719	260.6	199.4
Rainbow Trout	All	79	82	87	79	891	133	667	361	118.57	1073	226.7	149.0

Site Number: 340

Date Sampled: 10/07/1993

Conductivity (umhos/cm): 285

Site Midpoint (Latitude, Longitude): 44.40182261, -103.89476328

Site Length (m): 100

pH:

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK3, BR1, RB1

Mean Width (m): 9.0

Water Temperature (C): 6.0

Number of Pass: 3

Voltage: 350

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	6	6	8	6	67	2	60	27	1.78	97	122.3	29.8
Brook Trout	>=200mm	3	3	4	3	33	4	30	14	3.43	48	218.0	115.0
Brook Trout	All	9	9	11	9	100	6	90	41	5.21	145	154.2	58.2
Brown Trout	<200mm	47	77	133	47	857	35	770	347	31.26	1239	136.1	40.8
Brown Trout	>=200mm	73	73	74	73	813	152	730	329	135.57	1175	257.0	186.8
Brown Trout	All	120	126	133	120	1403	182	1260	568	162.38	2027	209.7	129.6
Rainbow Trout	<200mm	50	52	56	50	579	21	520	235	18.62	837	141.5	36.0
Rainbow Trout	>=200mm	48	48	49	48	535	96	480	216	85.67	772	249.9	179.5
Rainbow Trout	All	98	99	102	98	1102	117	990	446	104.63	1593	194.6	106.3

Site Number: 560

Date Sampled: 07/26/1993

Conductivity (umhos/cm): 300

Site Midpoint (Latitude, Longitude): 44.29446806, -103.89018647

Site Length (m): 100

pH: 8.9

Survey Completed by: South Dakota Game, Fish and Parks

Mean Width (m): 9.3

Water Temperature (C): 9.0

Stream Classification: BK0, BR1

Number of Pass: 3

Voltage: 350

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	16	19	28	16	205	5	190	83	4.73	306	130.3	25.8
Brook Trout	All	17	21	33	17	227	6	210	92	5.22	338	130.3	25.8
Brown Trout	<200mm	299	336	360	312	3629	131	3360	1470	116.72	5406	144.6	36.0
Brown Trout	>=200mm	67	67	69	67	724	85	670	293	75.97	1078	225.3	117.6
Brown Trout	All	368	400	419	381	4320	225	4000	1749	201.13	6436	159.4	52.1

Site Number: 604
Site Midpoint (Latitude, Longitude): 44.26490664, -103.91607855
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR2

Date Sampled: 10/04/1993
Site Length (m): 100
Mean Width (m): 4.1
Number of Pass: 3
Conductivity (umhos/cm): 307
pH:
Water Temperature (C): 10.0
Voltage: 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	440	474	493	455	11449	130	4740	4637	115.78	7627	96.0	11.3
Brook Trout	>=200mm	6	6	6	6	145	14	60	59	12.81	97	212.0	99.0
Brook Trout	All	446	479	498	460	11570	145	4790	4686	129.21	7707	97.5	12.5
Brown Trout	<200mm	56	71	93	56	1715	33	710	695	29.26	1142	113.0	19.1
Brown Trout	>=200mm	6	6	7	6	145	18	60	59	16.43	97	231.2	127.0
Brown Trout	All	62	76	96	62	1836	54	760	743	48.43	1223	124.5	29.5

Stream sites are classified based on the estimates of adult trout over eight inches that exist within the site. Estimates are derived from 3-pass backpack electrofishing surveys at 100-meter sites within streams. While all fish in the site are collected and measured, only trout species are used for classifications. Sites are numbered in accordance for the distance (m) from the stream confluence of a higher order stream/river.

Based on number of trout in excess of eight inches	
Class BR1	Number of wild Brown Trout exceeds 150 per acre
Class BR2	Number of wild Brook Trout ranges from 25 to 150 per acre
Class BR3	Number of wild Brown Trout is less than 25 per acre
Class BK1	Number of wild Brook Trout exceeds 150 per acre
Class BK2	Number of wild Brook Trout ranges from 25 to 150 per acre
Class BK3	Number of wild Brook Trout is less than 25 per acre
Class RB1	Number of wild Rainbow Trout exceeds 25 per acre
Class RB2	Number of wild Rainbow Trout is less than 25 per acre

Table 2. Species composition and population estimates on Spearfish Creek, 1983-1993

Site 174

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jul 30, 1987	15	15-15	
	Sep 13, 1990	77	75-81	
	Sep 24, 1991	78	65-97	
	Sep 28, 1992	67	65-71	
	Oct 06, 1993	41	34-54	
Brown Trout >=200mm	Jul 30, 1987	54	54-54	BR3
	Sep 13, 1990	141	137-147	BR3

Brown Trout >=200mm	Sep 24, 1991	84	60-122	BR3
	Sep 28, 1992	62	62-64	BR1
	Oct 06, 1993	49	48-52	BR1

Site 190

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jul 29, 1987	7	7-7	
	Nov 02, 1988	175	144-206	
	Jul 31, 1990	226	149-307	
	Sep 24, 1991	75	70-83	
	Oct 05, 1993	62	58-69	
Brown Trout >=200mm	Jul 29, 1987	26	26-26	BR3
	Nov 02, 1988	110	68-179	BR3
	Jul 31, 1990	200	187-213	BR3
	Sep 24, 1991	220	205-235	BR3
	Oct 05, 1993	209	209-211	BR1
Rainbow Trout <200mm	Jul 29, 1987	1	1-1	

Site 205

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Nov 02, 1988	66	66-66	
	Jul 31, 1990	103	78-137	
	Sep 24, 1991	65	61-72	
	Sep 30, 1992	55	54-58	
	Oct 05, 1993	70	68-74	
Brown Trout >=200mm	Jul 30, 1987	3	3-3	BR3
	Nov 02, 1988	56	56-56	BR3
	Jul 31, 1990	108	102-116	BR3
	Sep 24, 1991	175	132-219	BR3
	Sep 30, 1992	95	93-99	BR1
	Oct 05, 1993	99	98-102	BR1
Rainbow Trout <200mm	Nov 02, 1988	4	4-4	
Rainbow Trout >=200mm	Nov 02, 1988	3	3-3	RB2
	Jul 31, 1990	15	12-27	RB2
	Sep 24, 1991	11	11-12	RB2

Rainbow Trout >=200mm	Sep 30, 1992	2	2-2	RB2
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Site 334

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 30, 1992	1	1-1	
	Oct 06, 1993	1	1-1	
Brook Trout >=200mm	Oct 06, 1993	1	1-2	BK3
Brown Trout <200mm	Sep 25, 1991	135	79-224	
	Sep 30, 1992	74	60-94	
	Oct 06, 1993	64	61-69	
Brown Trout >=200mm	Sep 25, 1991	123	116-132	BR3
	Sep 30, 1992	111	104-120	BR1
	Oct 06, 1993	94	92-98	BR1
Rainbow Trout <200mm	Sep 25, 1991	24	19-38	
	Sep 30, 1992	23	18-37	
	Oct 06, 1993	25	25-27	
Rainbow Trout >=200mm	Sep 25, 1991	60	47-83	RB2

Rainbow Trout >=200mm	Sep 30, 1992	44	43-48	RB1
	Oct 06, 1993	55	54-59	RB1

Site 340

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 02, 1992	10	10-12	
	Oct 07, 1993	6	6-8	
Brook Trout >=200mm	Oct 02, 1992	6	6-9	BK2
	Oct 07, 1993	3	3-4	BK3
Brown Trout <200mm	Sep 26, 1991	67	66-70	
	Oct 02, 1992	84	66-108	
	Oct 07, 1993	77	47-133	
Brown Trout >=200mm	Sep 26, 1991	23	21-29	BR3
	Oct 02, 1992	67	67-69	BR1
	Oct 07, 1993	73	73-74	BR1
Rainbow Trout <200mm	Sep 26, 1991	75	39-166	
	Oct 02, 1992	135	104-168	

Rainbow Trout <200mm	Oct 07, 1993	52	50-56	
Rainbow Trout >=200mm	Sep 26, 1991	26	23-34	RB2
	Oct 02, 1992	43	41-48	RB1
	Oct 07, 1993	48	48-49	RB1

Site 560

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Jul 26, 1993	19	16-28	
Brown Trout <200mm	Jul 26, 1993	336	312-360	
Brown Trout >=200mm	Jul 26, 1993	67	67-69	BR1

Site 604

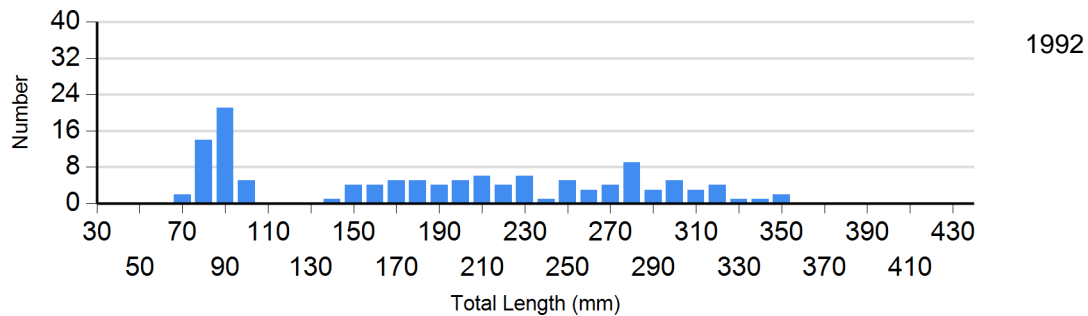
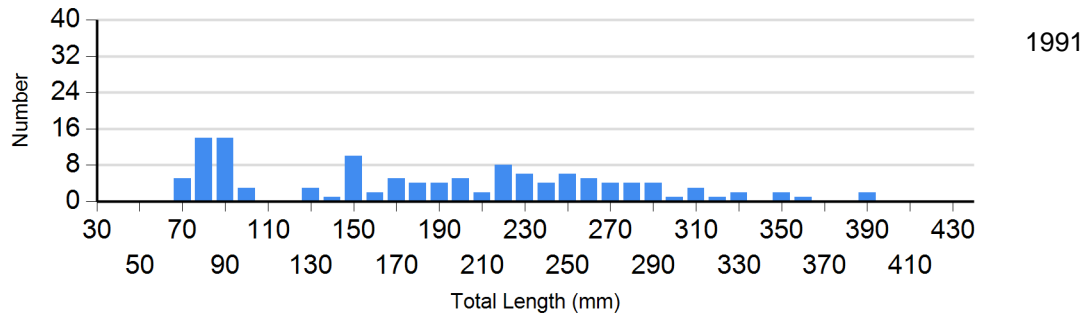
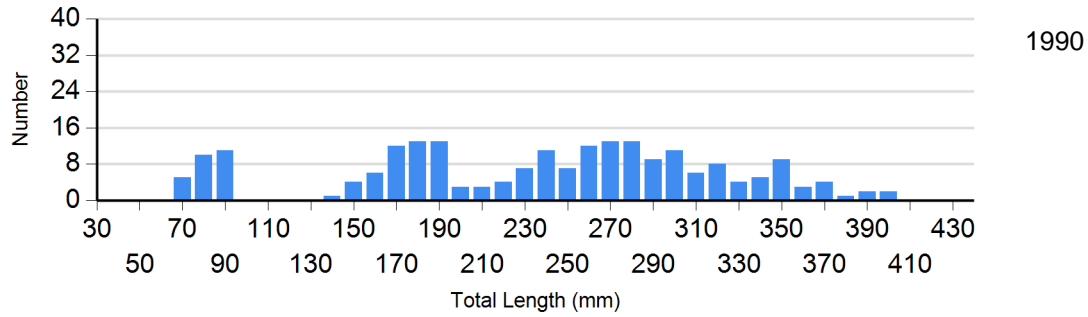
Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 04, 1993	474	455-493	
Brook Trout >=200mm	Oct 04, 1993	6	6-6	BK2
Brown Trout <200mm	Oct 04, 1993	71	56-93	
Brown Trout >=200mm	Oct 04, 1993	6	6-7	BR2

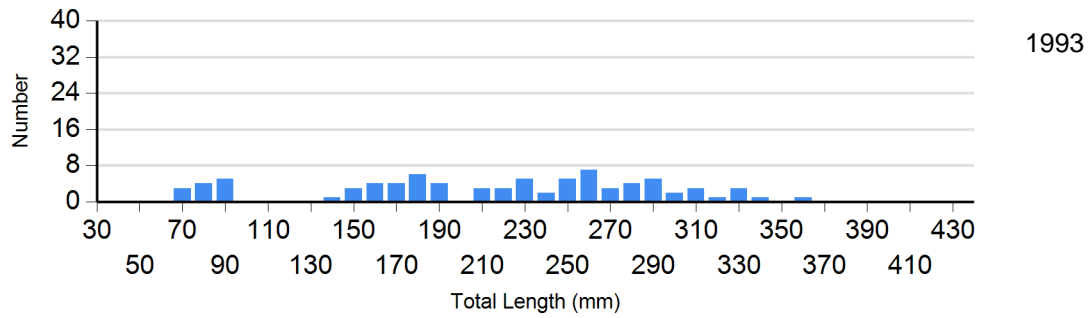
Length Frequency Distribution

Length frequency histogram of species sampled by year.

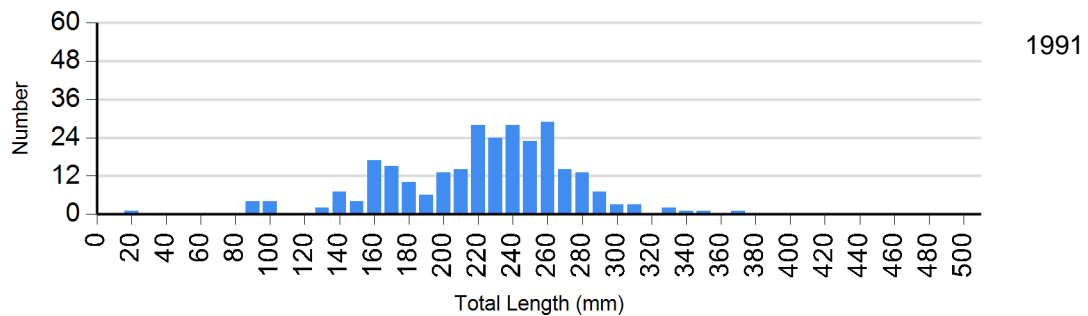
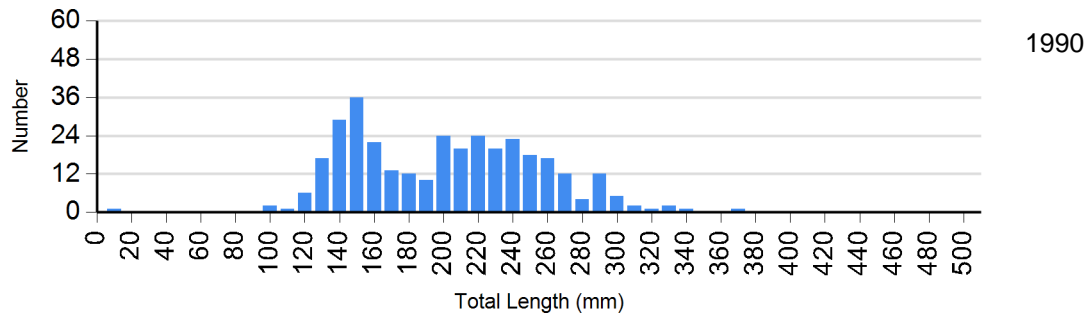
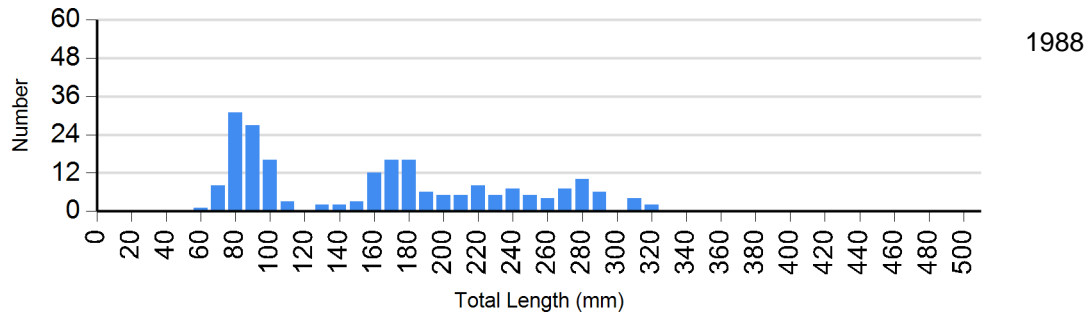
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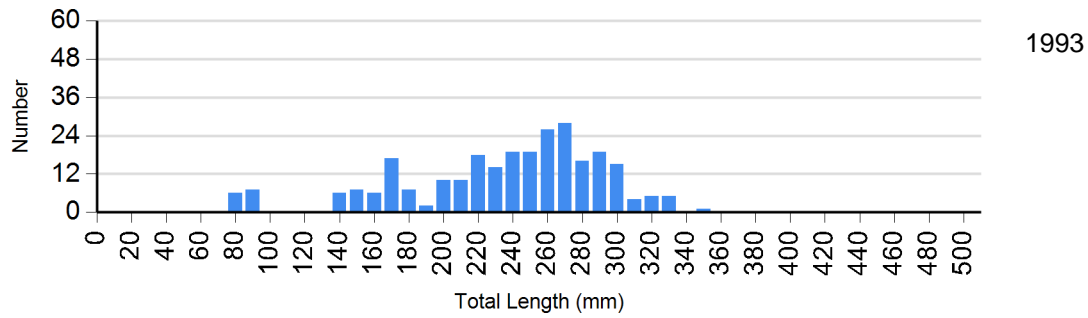
Species: Brown Trout



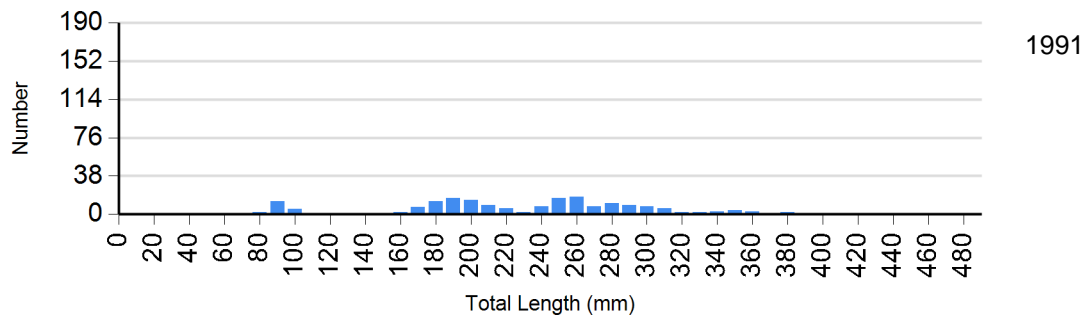
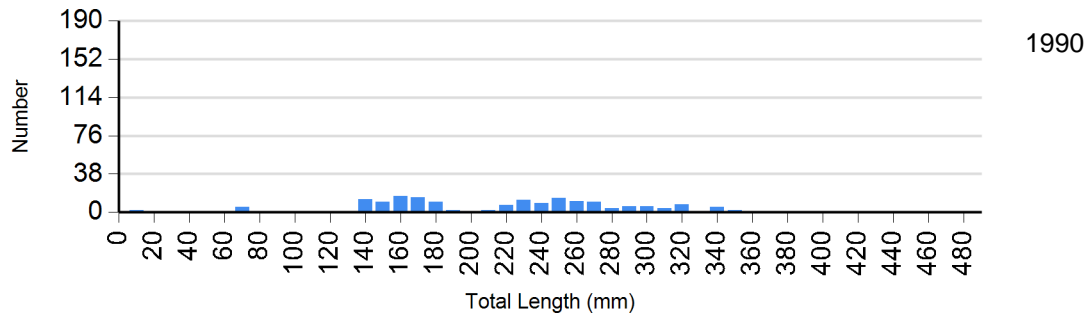
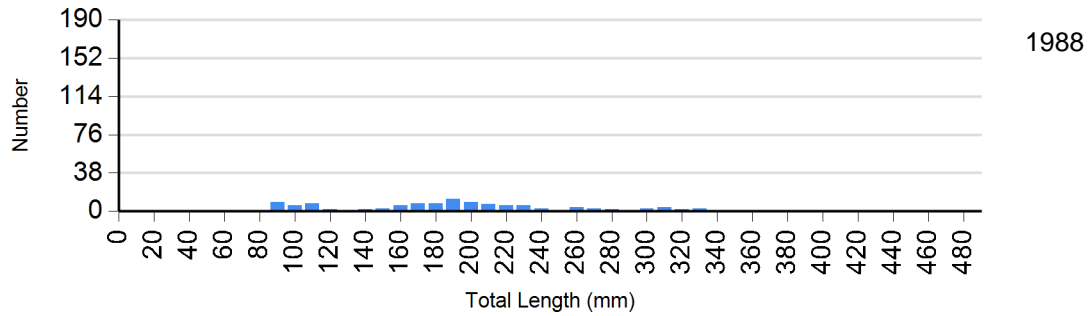


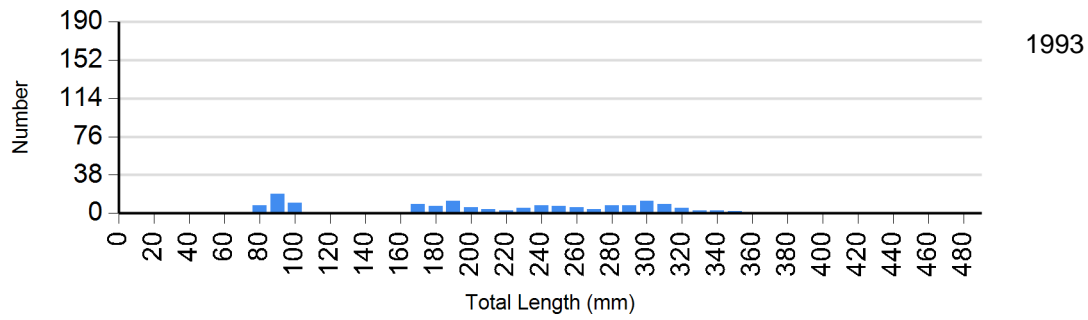
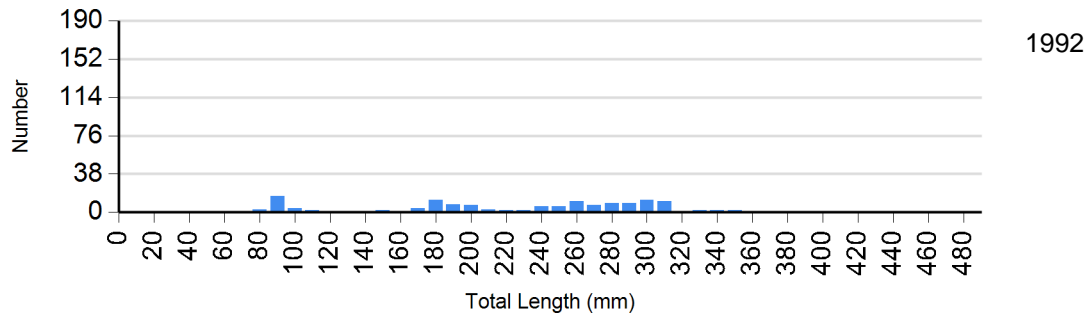
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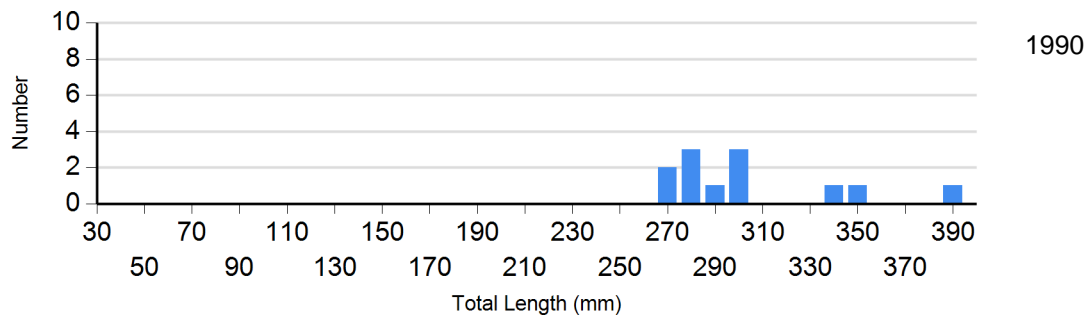
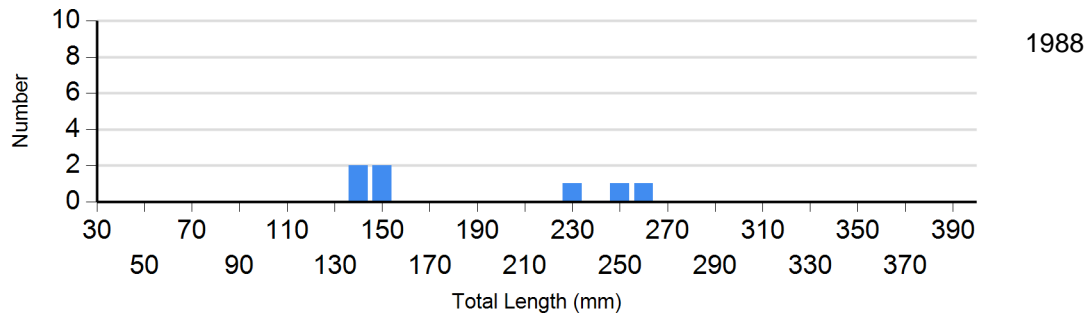


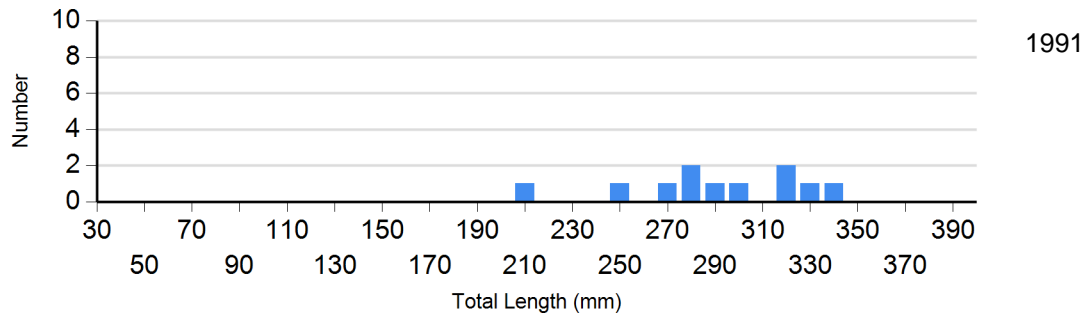
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Species: Brown Trout



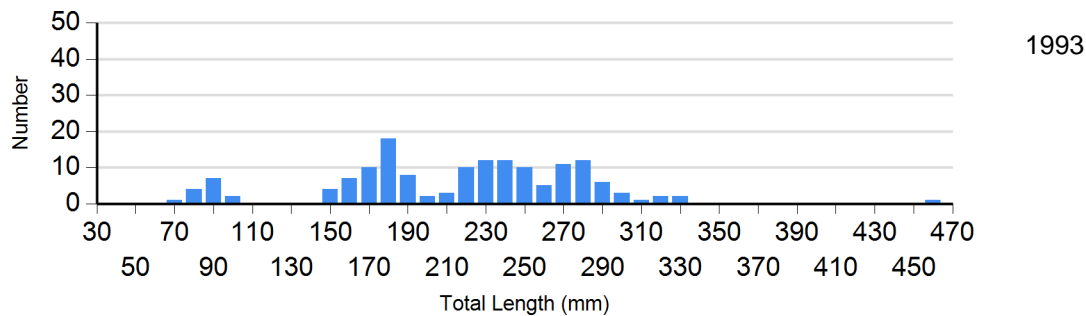
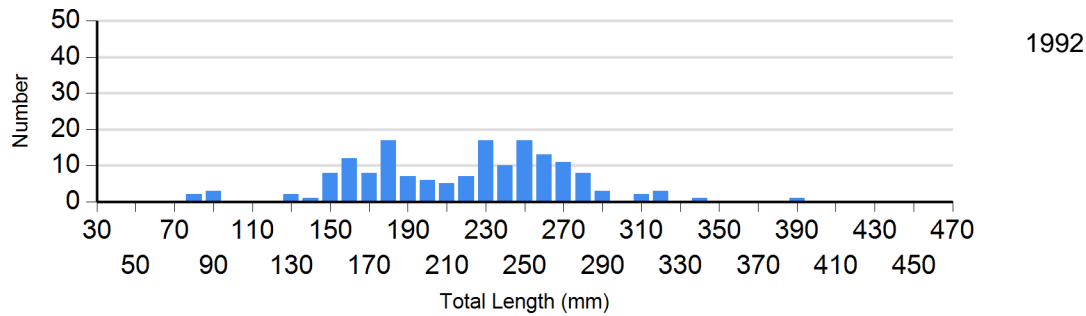
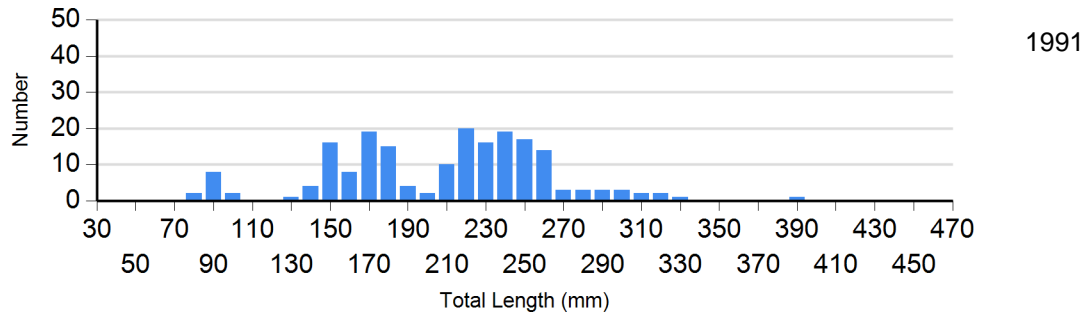


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Species: Rainbow Trout

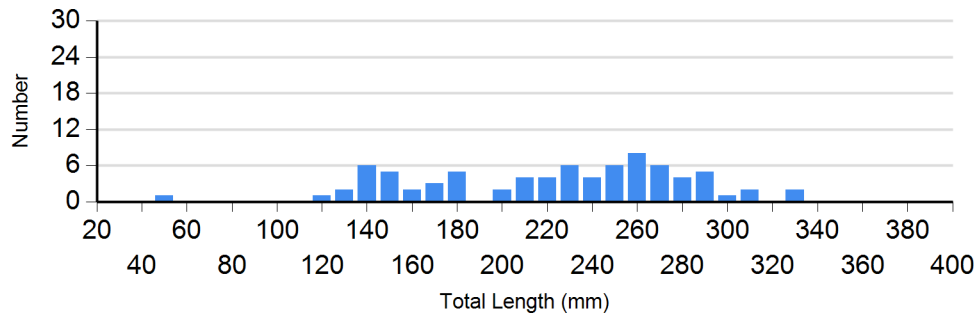
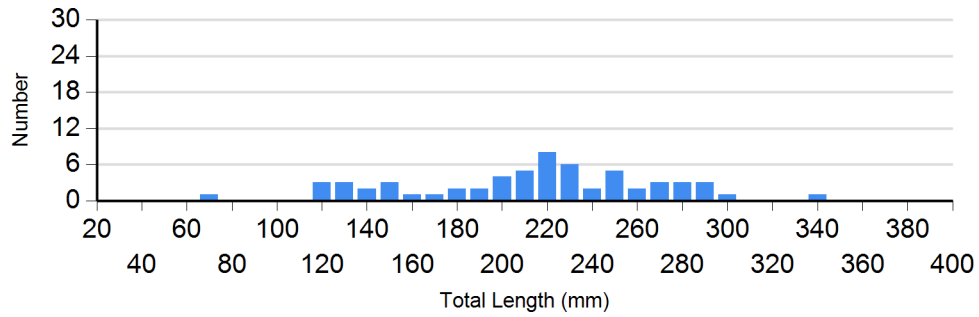
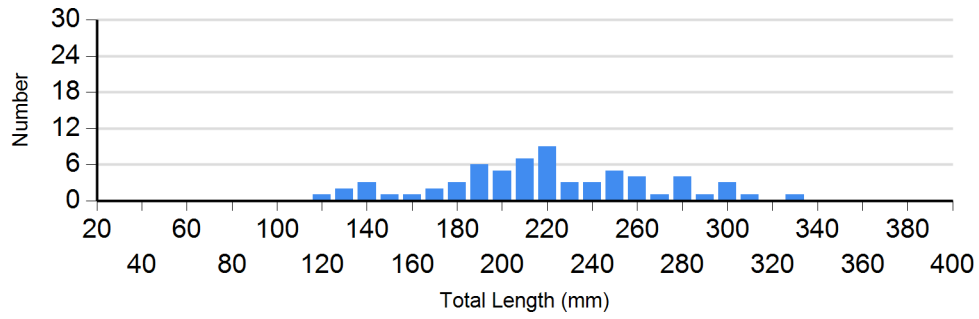




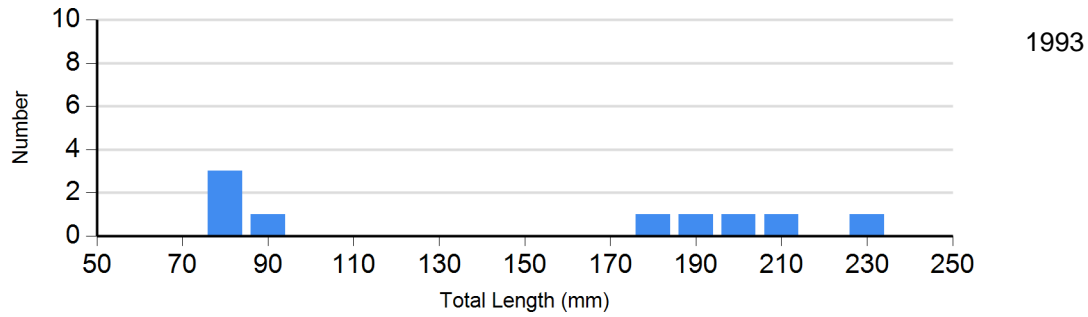
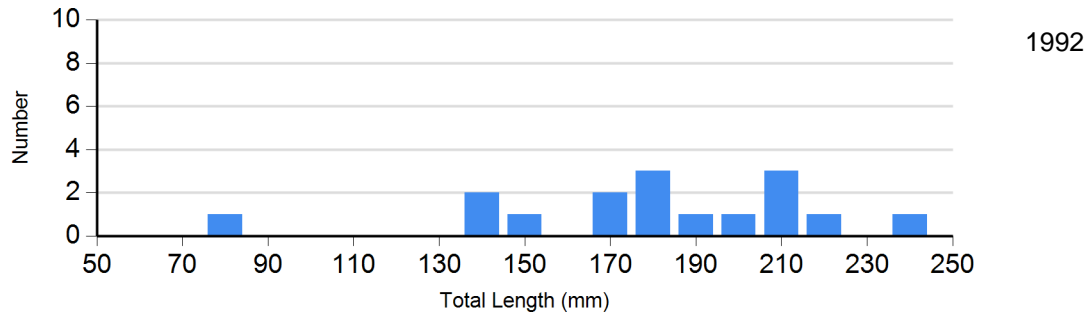
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Species: Brown Trout



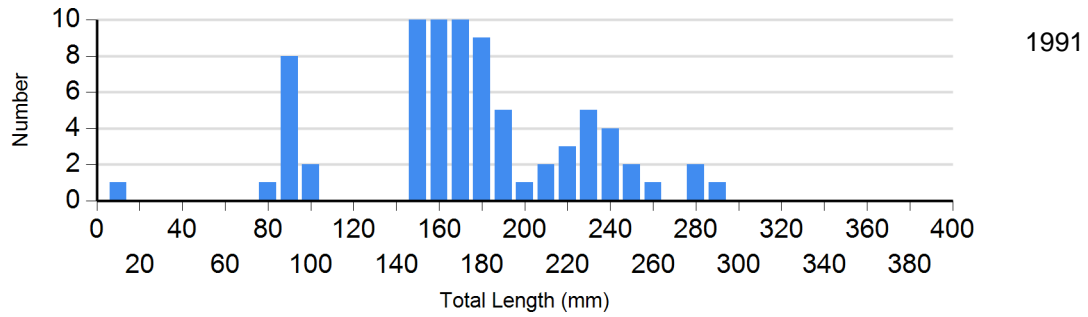
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Species: Rainbow Trout

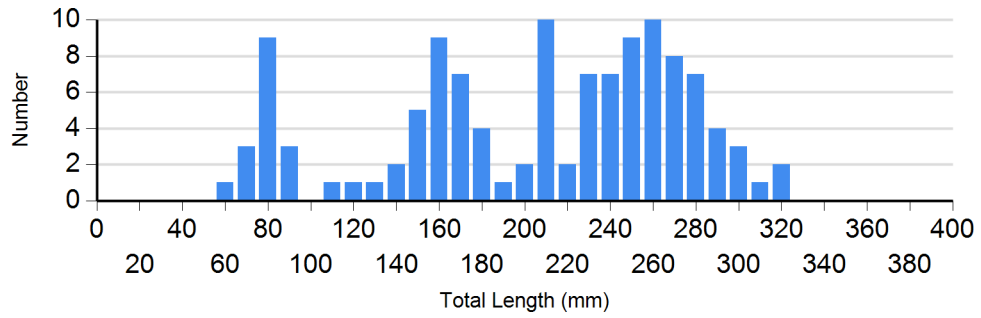
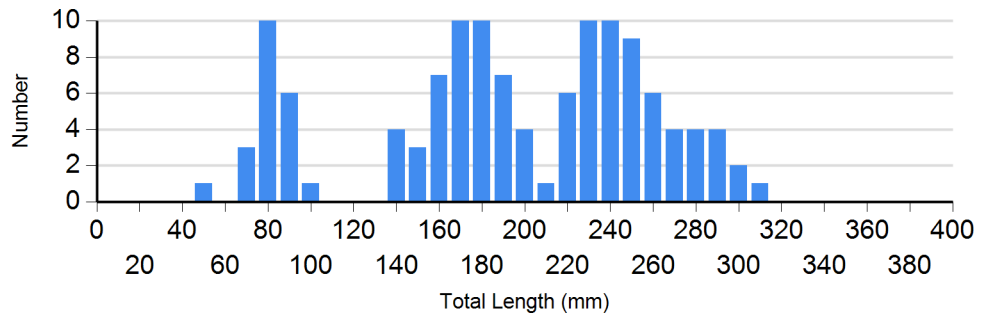


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Species: Brook Trout

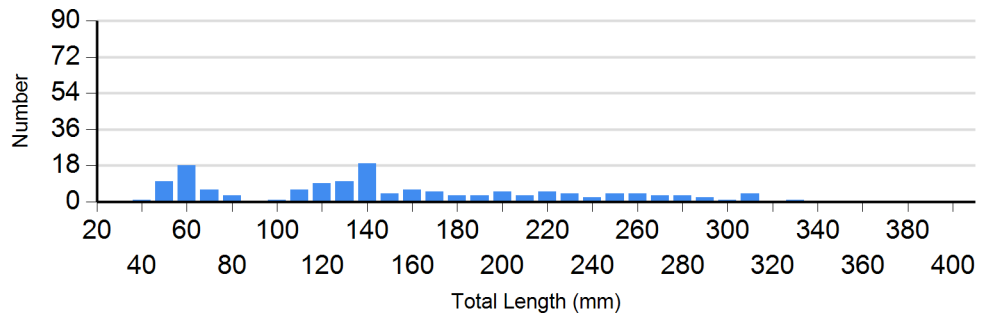
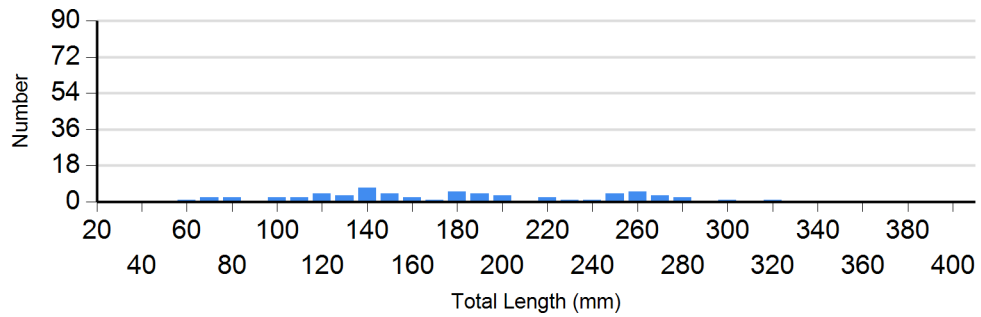


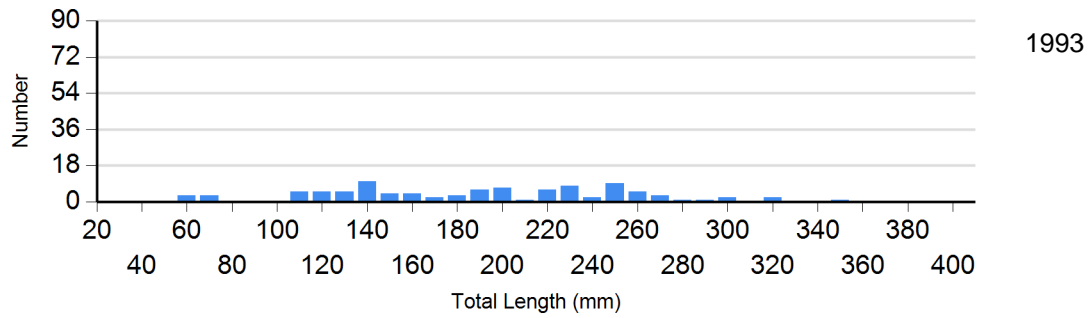
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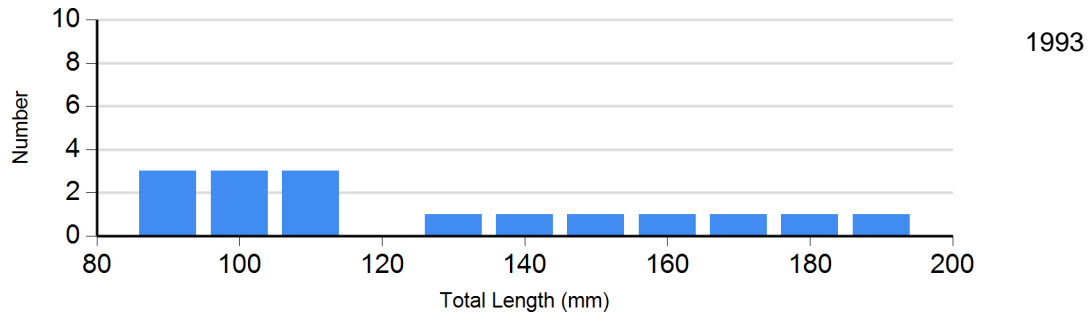


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Species: Rainbow Trout

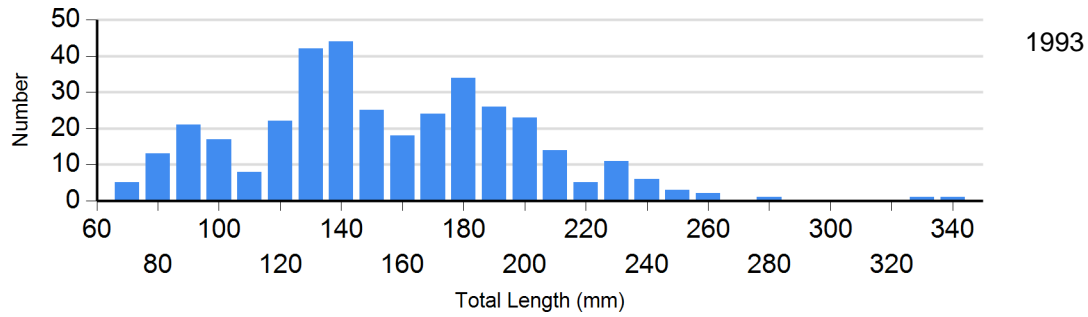




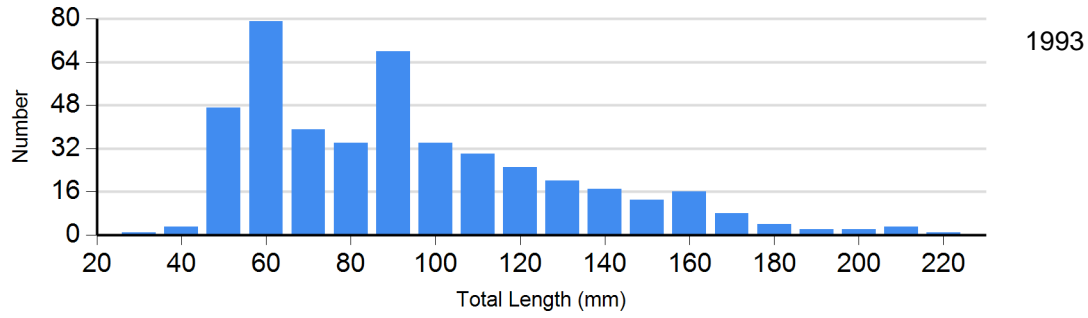
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Species: Brook Trout



Site: 560
Species: Brown Trout



Site: 604
Species: Brook Trout



Site: 604
Species: Brown Trout

