

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Castle Creek, Pennington County
02-0071-00
1996

Table 1. Population and Biomass Estimates for Castle Creek

Site Number: 356	Date Sampled: 09/24/1996	Conductivity (umhos/cm):	283
Site Midpoint (Latitude, Longitude): 44.05717425, -103.76307493	Site Length (m): 110	pH:	8.9
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.2	Water Temperature (C):	12.0
Stream Classification: BK2, BR1	Number of Pass: 4	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)
Brook Trout	<200mm	72	71	83	72	1690	29	645	685	25.81	1039	109.3	17.1
Brook Trout	>=200mm	8	8	10	8	190	23	73	77	20.45	117	220.6	120.3
Brook Trout	All	80	79	91	80	1881	52	718	762	46.04	1156	120.5	27.4
Brown Trout	<200mm	14	18	30	14	429	2	164	174	2.00	263	82.4	5.2
Brown Trout	>=200mm	17	17	19	17	405	64	155	164	57.00	249	246.5	157.7
Brown Trout	All	31	36	46	31	857	76	327	347	67.99	527	172.4	88.8

Site Number: 384	Date Sampled: 09/16/1996	Conductivity (umhos/cm):	282
Site Midpoint (Latitude, Longitude): 44.04396904, -103.77363060	Site Length (m): 113	pH:	8.6
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.5	Water Temperature (C):	14.0
Stream Classification: BK1, BR1	Number of Pass: 4	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	30	30	32	30	667	25	265	270	22.38	427	143.8	37.6
Brook Trout	>=200mm	25	25	27	25	556	70	221	225	62.28	356	220.7	125.6
Brook Trout	All	55	56	59	55	1244	97	496	504	86.20	797	178.7	77.6

Brown Trout	<200mm	4	4	5	4	89	2	35	36	1.83	57	104.5	23.0
Brown Trout	>=200mm	29	32	39	29	711	164	283	288	146.67	456	272.9	231.0
Brown Trout	All	33	36	43	33	800	165	319	324	146.99	513	252.5	205.8

Site Number: 388
Site Midpoint (Latitude, Longitude): 44.04338453, -103.77130517
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR1

Date Sampled: 09/16/1996 **Conductivity (umhos/cm):** 300
Site Length (m): 93
Mean Width (m): 4.1 **pH:** 8.7
Number of Pass: 3 **Water Temperature (C):** 15.0
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	34	41	54	34	1000	50	441	405	44.75	709	159.2	50.1
Brook Trout	>=200mm	12	12	12	12	293	44	129	119	38.98	208	232.7	149.2
Brook Trout	All	46	50	57	46	1220	93	538	494	82.71	865	178.4	76.0
Brown Trout	>=200mm	21	22	26	21	537	133	237	217	119.05	381	275.9	248.5
Brown Trout	All	21	22	26	21	537	133	237	217	119.05	381	275.9	248.5

Site Number: 396
Site Midpoint (Latitude, Longitude): 44.04066846, -103.77461137
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK1, BR1

Date Sampled: 09/17/1996 **Conductivity (umhos/cm):** 275
Site Length (m): 125
Mean Width (m): 5.4 **pH:** 8.6
Number of Pass: 3 **Water Temperature (C):** 12.0
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)
Brook Trout	<200mm	19	20	24	19	370	16	160	150	13.94	257	148.7	42.2
Brook Trout	>=200mm	31	31	32	31	574	77	248	233	68.78	399	226.7	134.2
Brook Trout	All	50	51	54	50	944	94	408	383	83.67	656	197.1	99.2
Brown Trout	>=200mm	20	20	20	20	370	100	160	150	89.39	257	284.1	270.3

Brown Trout All 20 20 20 20 370 100 160 150 89.39 257 284.1 270.3

Site Number: 407

Site Midpoint (Latitude, Longitude): 44.03301361, -103.77614426

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK1, BR1

Date Sampled: 09/18/1996

Site Length (m): 100

Mean Width (m): 4.6

Number of Pass: 3

Conductivity (umhos/cm): 271

pH: 8.5

Water Temperature (C): 9.0

Voltage: 253

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	48	57	71	48	1250	33	570	506	29.81	917	128.1	26.7
Brook Trout	>=200mm	23	23	25	23	504	96	230	204	85.98	370	253.1	190.9
Brook Trout	All	71	79	90	71	1732	138	790	702	123.60	1271	168.6	79.9
Brown Trout	<200mm	2	2	6	2	44	2	20	18	1.76	32	169.0	45.0
Brown Trout	>=200mm	21	21	23	21	461	189	210	187	168.94	338	325.1	410.9
Brown Trout	All	23	25	30	23	548	208	250	222	185.55	402	311.5	379.0
White Sucker	All	1	1	1	1	22	0	10	9	0.02	16	48.0	1.0

Site Number: 411

Site Midpoint (Latitude, Longitude): 44.03210666, -103.77970750

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK2, BR2

Date Sampled: 09/18/1996

Site Length (m): 100

Mean Width (m): 6.0

Number of Pass: 3

Conductivity (umhos/cm): 274

pH: 8.4

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	53	57	64	53	956	33	570	387	29.28	917	135.6	34.3
Brook Trout	>=200mm	14	14	14	14	235	45	140	95	39.83	225	244.6	189.9
Brook Trout	All	67	69	74	67	1158	77	690	469	69.06	1110	158.4	66.8
Brown Trout	<200mm	1	1	1	1	17	1	10	7	0.55	16	149.0	37.0

Brown Trout	>=200mm	6	6	7	6	101	26	60	41	23.33	97	284.2	259.5
Brown Trout	All	7	7	8	7	117	27	70	48	23.88	113	264.9	227.7

Site Number: 417

Site Midpoint (Latitude, Longitude): 44.03016917, -103.78286708

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK1, BR2

Date Sampled: 09/24/1996

Site Length (m): 107

Mean Width (m): 5.8

Number of Pass: 3

Conductivity (umhos/cm): 277

pH: 8.5

Water Temperature (C): 10.0

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)
Brook Trout	<200mm	31	31	32	31	536	36	290	217	32.53	466	184.5	67.9
Brook Trout	>=200mm	104	104	106	104	1799	404	972	729	360.98	1564	259.0	224.7
Brook Trout	All	135	136	139	135	2353	444	1271	953	396.43	2045	241.8	188.7
Brown Trout	>=200mm	8	8	8	8	138	51	75	56	45.66	120	304.9	369.5
Brown Trout	All	8	8	8	8	138	51	75	56	45.66	120	304.9	369.5
White Sucker	All	9	9	10	9	156	22	84	63	19.51	135	197.3	140.3

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 Castle Creek, 1986-1996

Site 356

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 16, 1992	71	71-72	
	Oct 13, 1993	80	71-92	
	Nov 08, 1994	167	165-171	
	Sep 06, 1995	50	50-52	
	Sep 24, 1996	71	72-83	
Brook Trout >=200mm	Oct 16, 1992	3	3-3	BK2
	Oct 13, 1993	5	5-5	BK2

Brook Trout >=200mm	Nov 08, 1994	7	7-7	BK2
	Sep 06, 1995	7	7-8	BK2
	Sep 24, 1996	8	8-10	BK2
Brown Trout <200mm	Oct 16, 1992	86	84-90	
	Oct 13, 1993	58	57-61	
	Nov 08, 1994	59	59-61	
	Sep 06, 1995	21	21-22	
	Sep 24, 1996	18	14-30	
Brown Trout >=200mm	Oct 16, 1992	23	23-24	BR1
	Oct 13, 1993	25	25-25	BR1
	Nov 08, 1994	24	24-24	BR1
	Sep 06, 1995	30	30-30	BR1
	Sep 24, 1996	17	17-19	BR1

Site 384

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 14, 1992	127	109-146	

Brook Trout <200mm	Oct 12, 1993	87	84-92	
	Nov 07, 1994	81	81-83	
	Sep 05, 1995	60	59-63	
	Sep 16, 1996	30	30-32	
Brook Trout >=200mm	Oct 14, 1992	11	11-12	BK2
	Oct 12, 1993	21	21-21	BK1
	Nov 07, 1994	12	12-13	BK2
	Sep 05, 1995	30	30-31	BK1
	Sep 16, 1996	25	25-27	BK1
Brown Trout <200mm	Oct 14, 1992	13	13-14	
	Oct 12, 1993	38	37-41	
	Nov 07, 1994	10	10-10	
	Sep 05, 1995	6	6-8	
	Sep 16, 1996	4	4-5	
Brown Trout >=200mm	Oct 14, 1992	34	32-39	BR1
	Oct 12, 1993	29	29-30	BR1

Brown Trout >=200mm	Nov 07, 1994	47	43-55	BR1
	Sep 05, 1995	43	43-45	BR1
	Sep 16, 1996	32	29-39	BR1
White Sucker	Oct 14, 1992	7	7-9	
	Nov 07, 1994	1	1-2	

Site 388

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 14, 1992	26	26-27	
	Oct 12, 1993	58	53-66	
	Nov 07, 1994	67	67-68	
	Sep 05, 1995	69	63-78	
	Sep 16, 1996	41	34-54	
Brook Trout >=200mm	Oct 14, 1992	16	12-30	BK2
	Oct 12, 1993	14	14-15	BK2
	Nov 07, 1994	34	34-35	BK1
	Sep 05, 1995	35	35-36	BK1

Brook Trout >=200mm	Sep 16, 1996	12	12-12	BK2
Brown Trout <200mm	Oct 14, 1992	10	10-10	
	Oct 12, 1993	17	17-19	
	Nov 07, 1994	10	10-10	
	Sep 05, 1995	2	2-2	
Brown Trout >=200mm	Oct 14, 1992	27	27-28	BR1
	Oct 12, 1993	33	33-35	BR1
	Nov 07, 1994	31	31-32	BR1
	Sep 05, 1995	26	25-30	BR1
	Sep 16, 1996	22	21-26	BR1
White Sucker	Nov 07, 1994	1	1-1	

Site 396

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 17, 1996	20	19-24	
Brook Trout >=200mm	Sep 17, 1996	31	31-32	BK1
Brown Trout >=200mm	Sep 17, 1996	20	20-20	BR1

Site 407

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 18, 1996	57	48-71	
Brook Trout >=200mm	Sep 18, 1996	23	23-25	BK1
Brown Trout <200mm	Sep 18, 1996	2	2-6	
Brown Trout >=200mm	Sep 18, 1996	21	21-23	BR1
White Sucker	Sep 18, 1996	1	1-1	

Site 411

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 06, 1995	59	50-73	
	Sep 18, 1996	57	53-64	
Brook Trout >=200mm	Sep 06, 1995	10	10-10	BK2
	Sep 18, 1996	14	14-14	BK2
Brown Trout <200mm	Sep 06, 1995	3	3-3	
	Sep 18, 1996	1	1-1	
Brown Trout >=200mm	Sep 18, 1996	6	6-7	BR2

Site 417

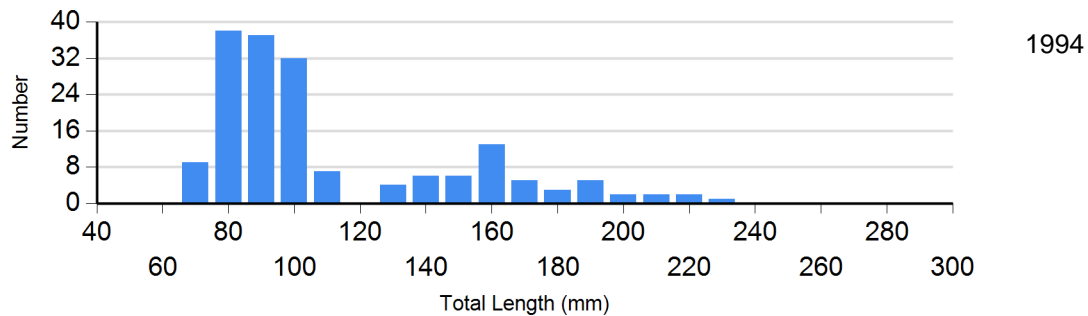
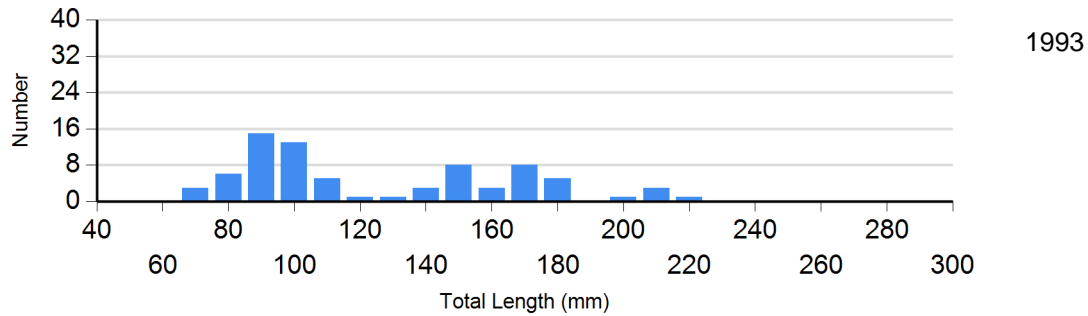
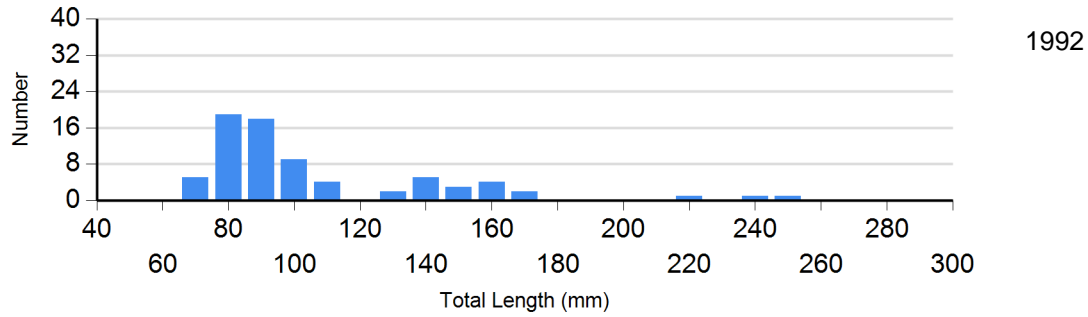
Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 24, 1996	31	31-32	
Brook Trout >=200mm	Sep 24, 1996	104	104-106	BK1
Brown Trout >=200mm	Sep 24, 1996	8	8-8	BR2
White Sucker	Sep 24, 1996	9	9-10	

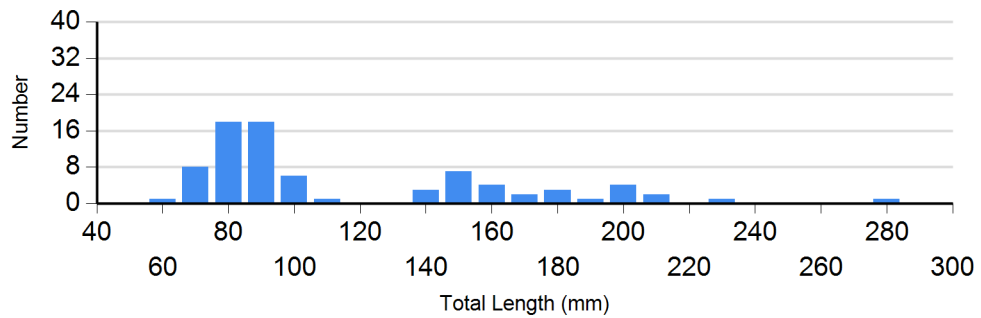
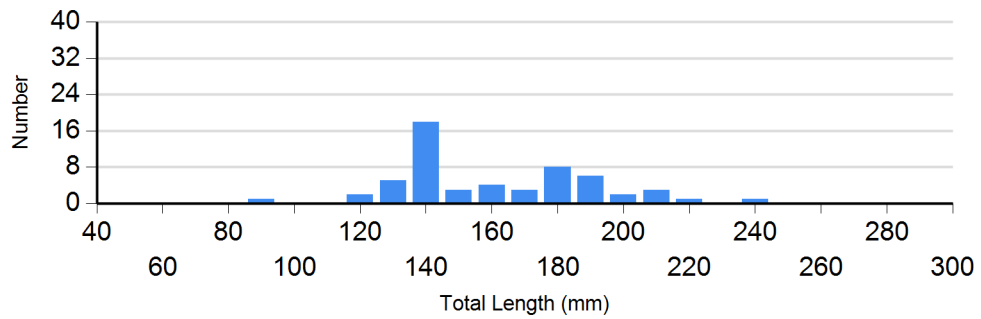
Length Frequency Distribution

Length frequency histogram of species sampled by year.

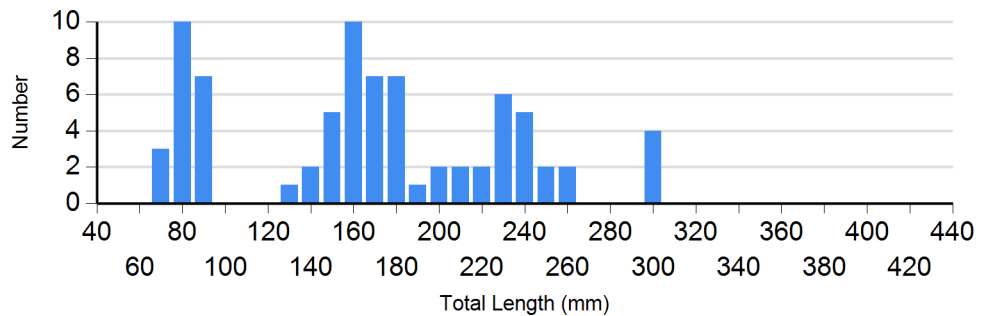
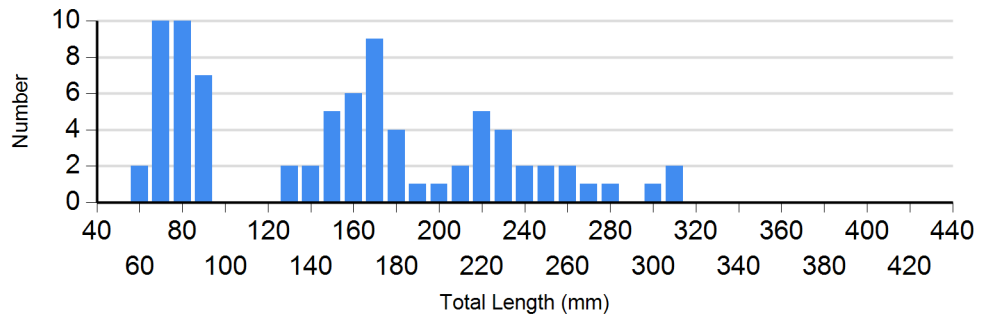
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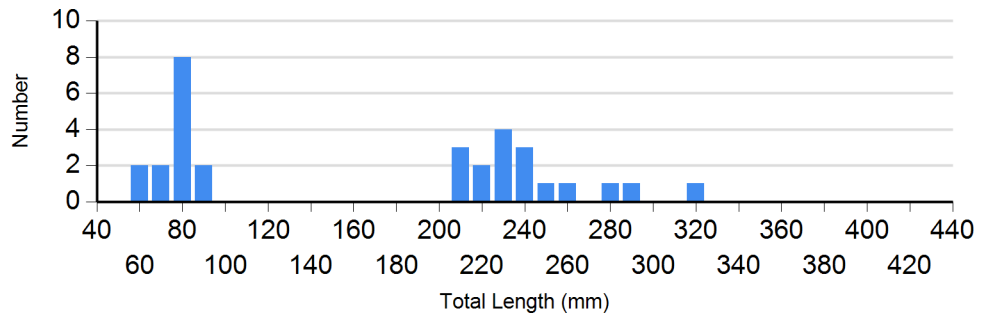
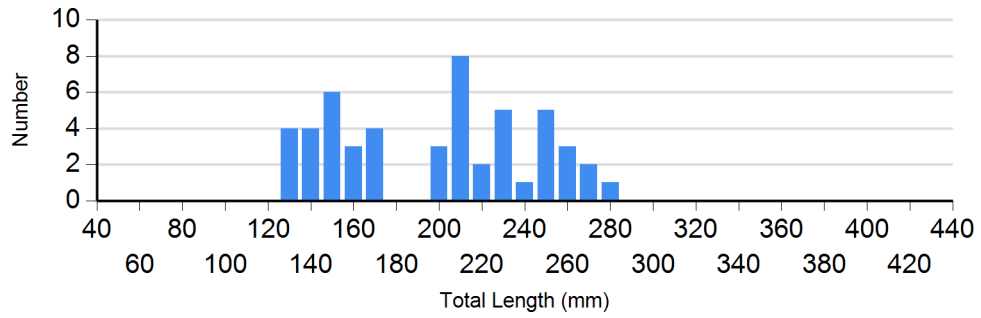
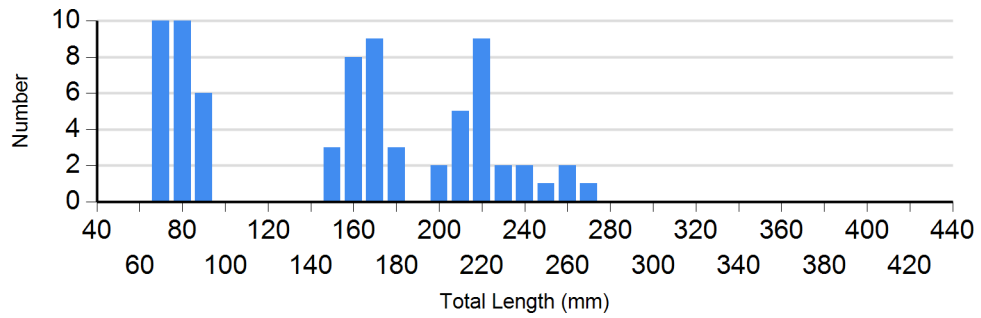
Species: Brook Trout



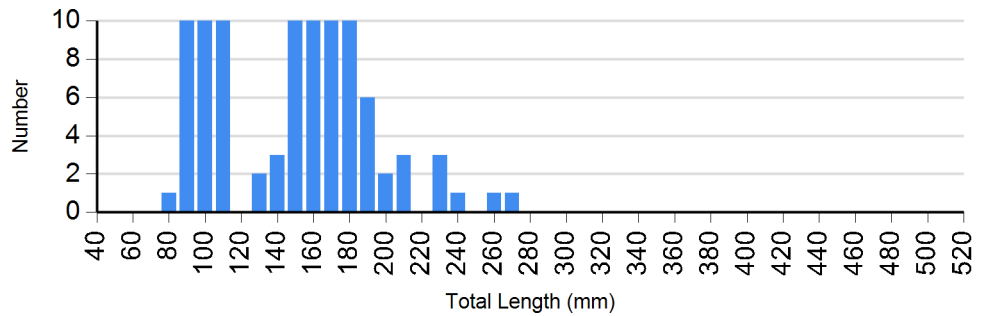


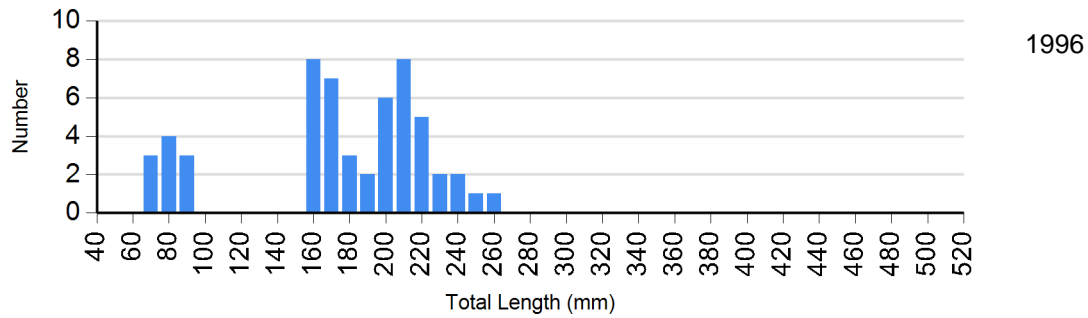
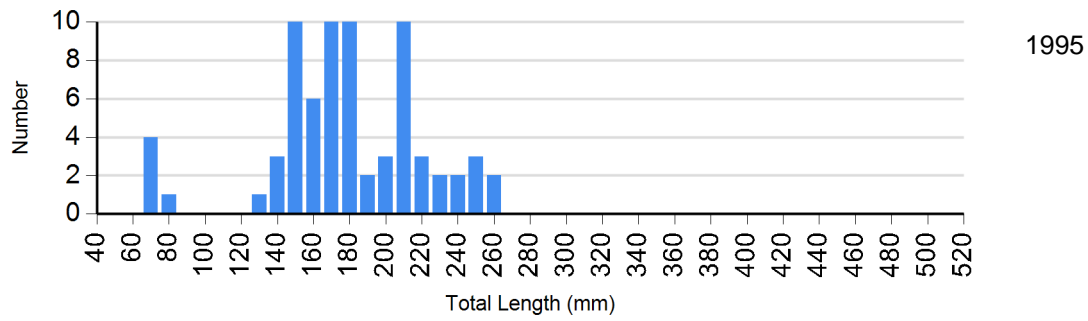
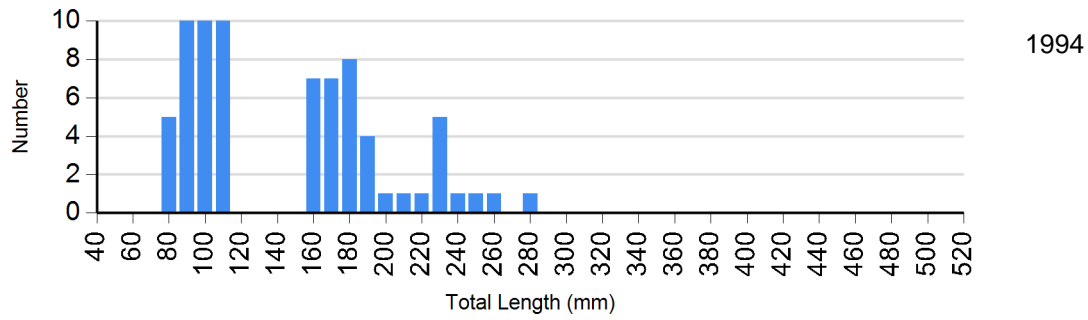
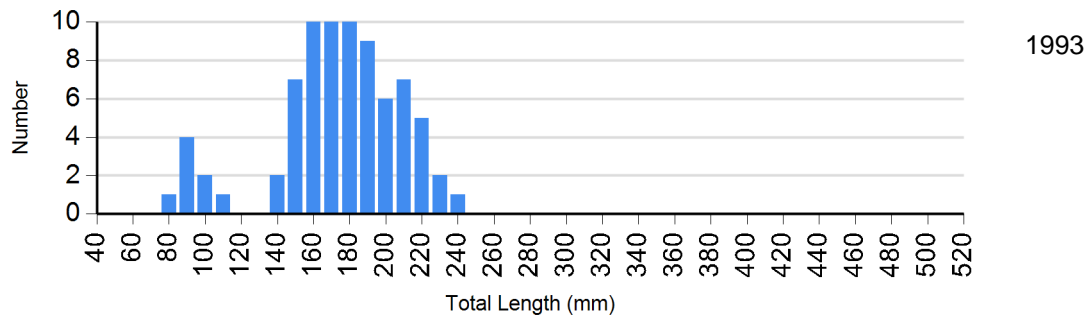
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Species: Brown Trout



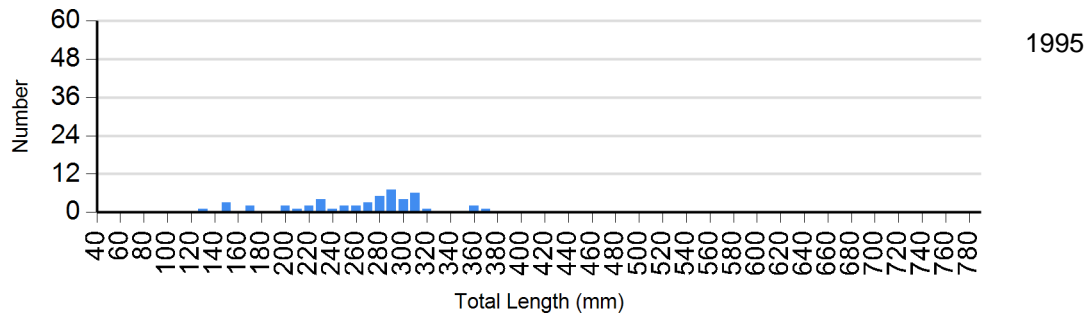
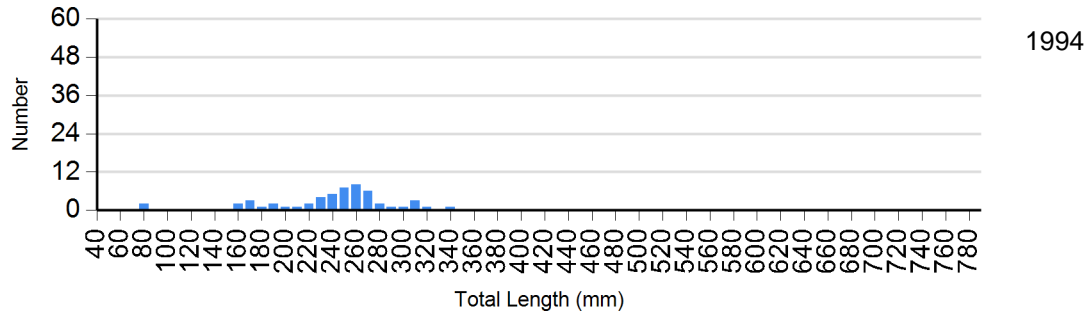
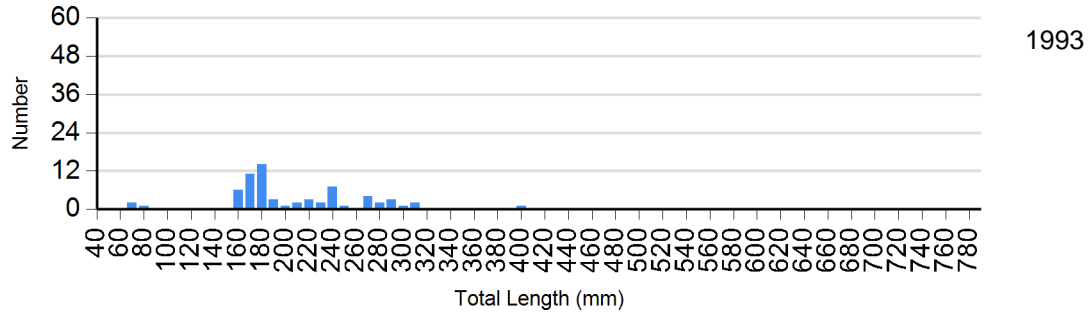
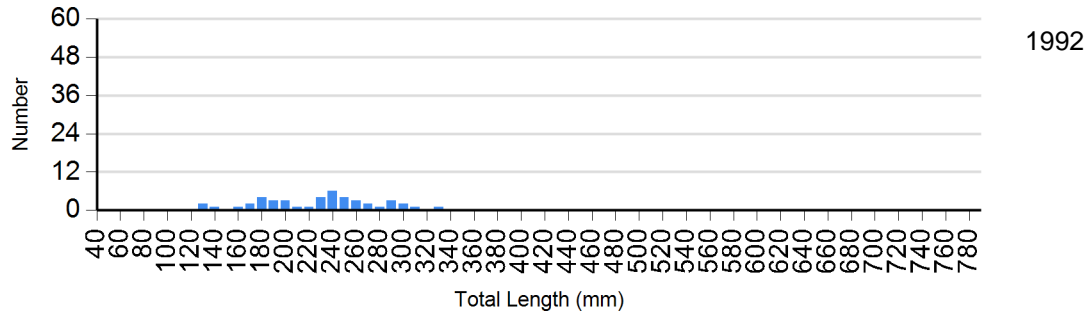


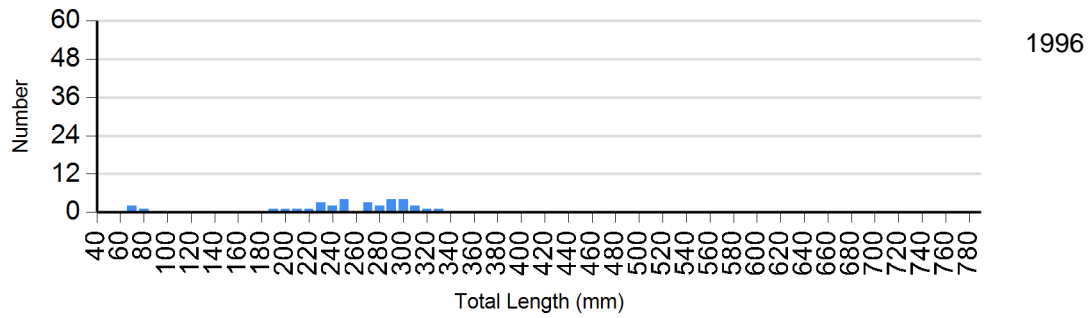
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Species: Brook Trout



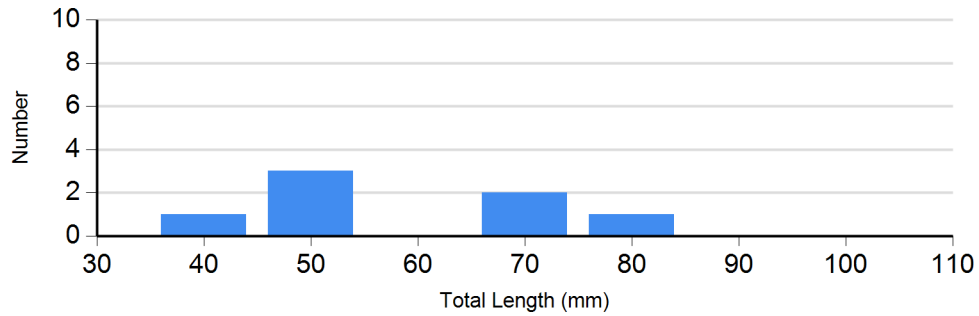


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Species: Brown Trout

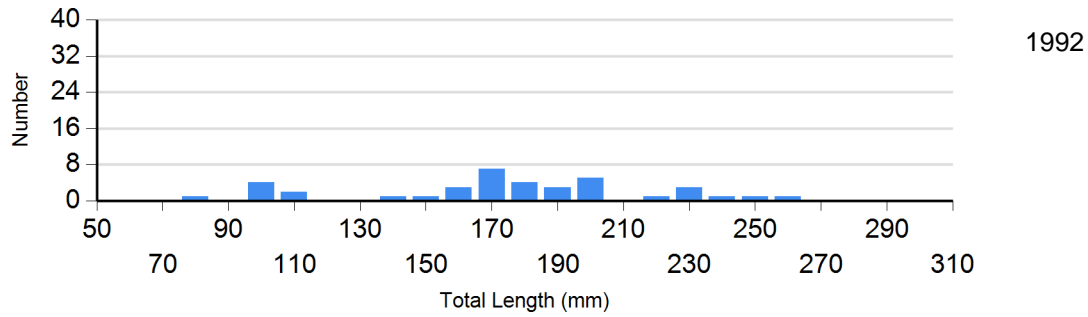


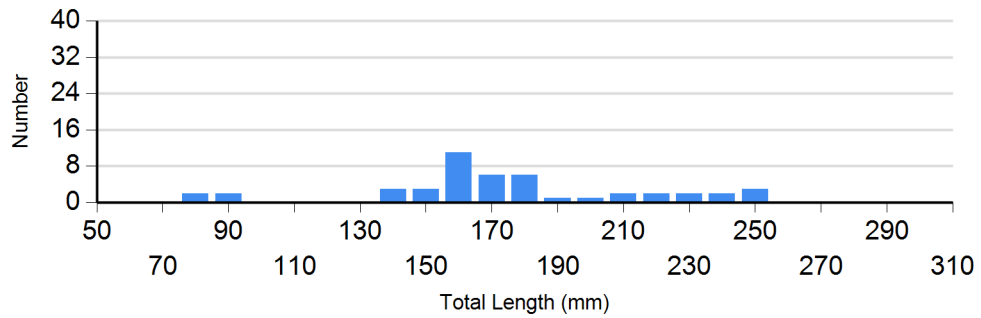
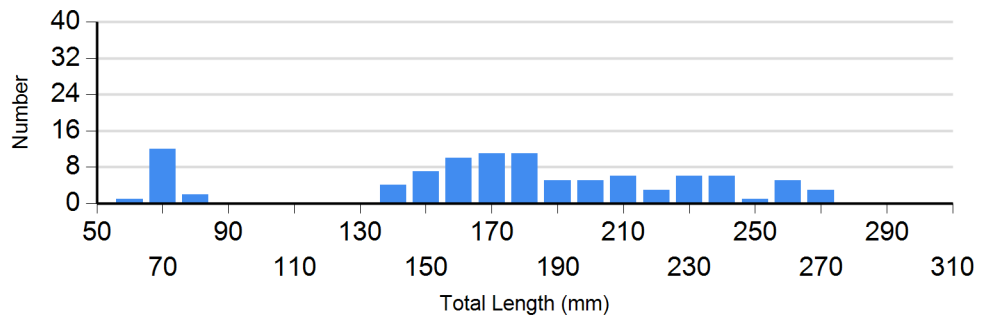
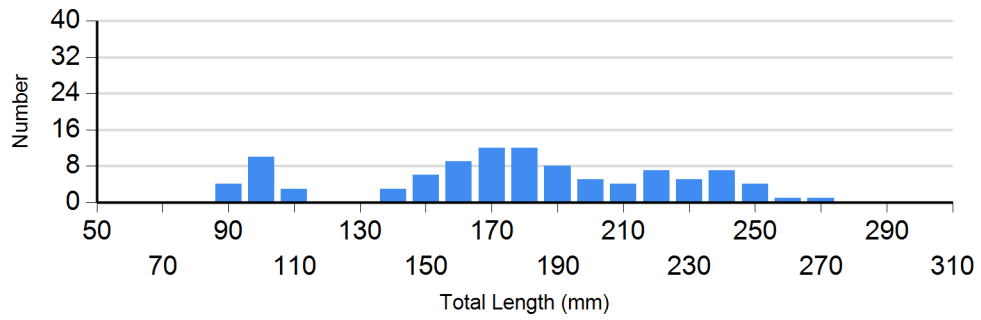
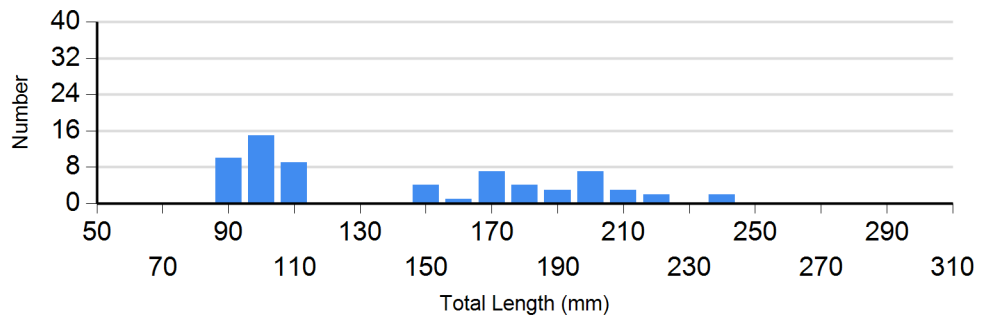


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Species: White Sucker

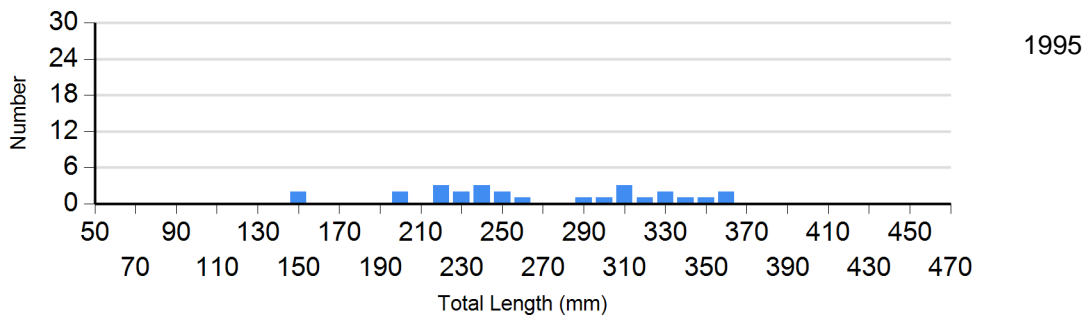
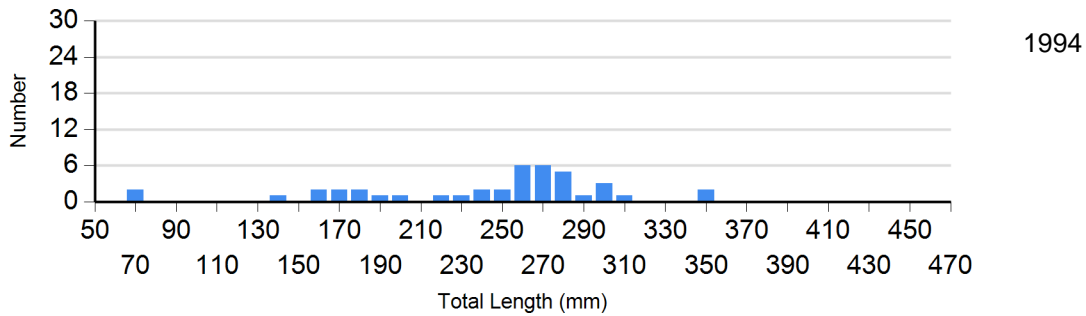
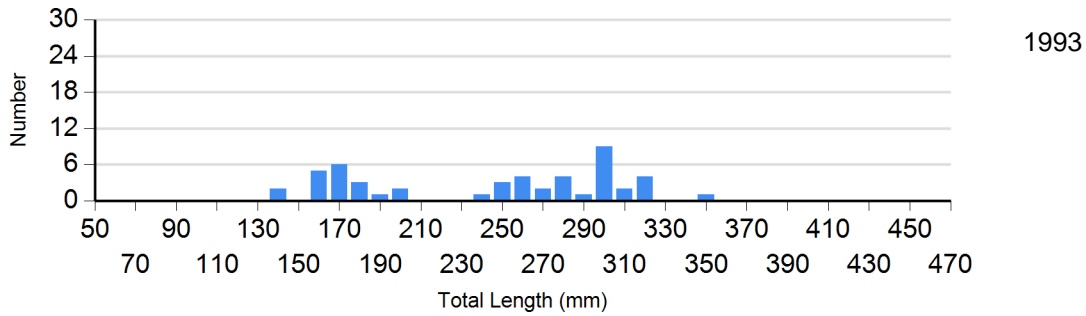
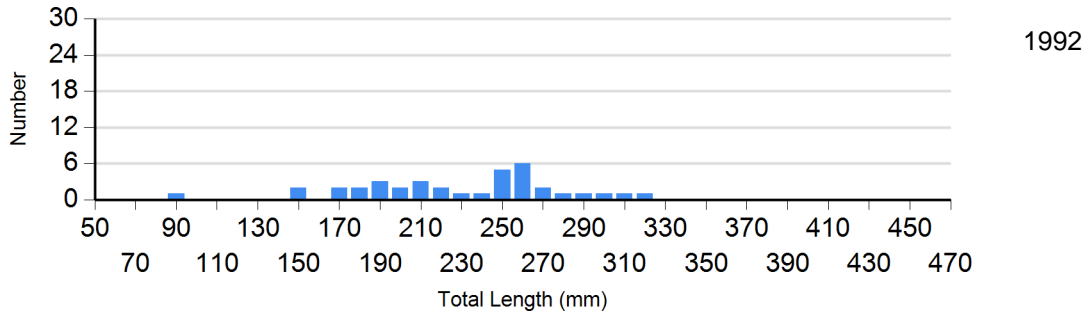


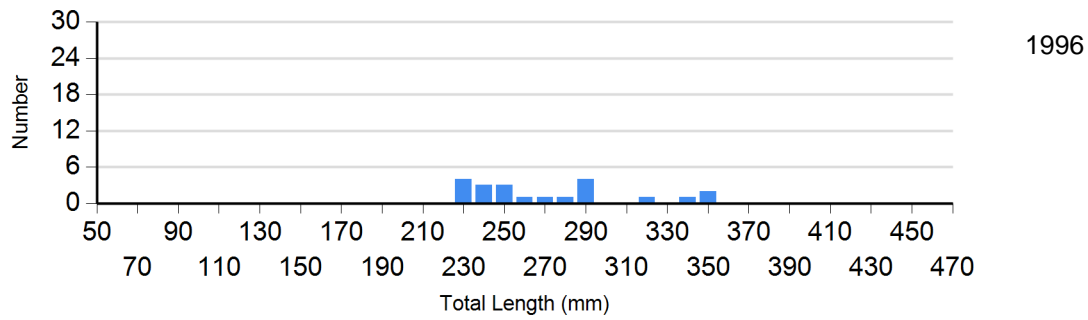
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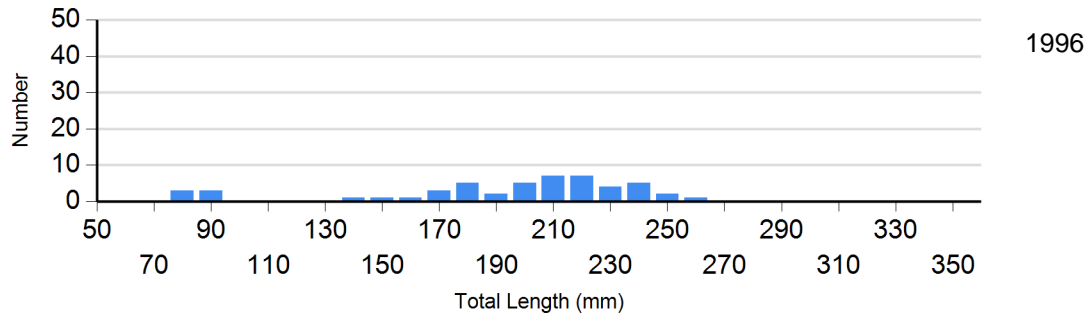


Site: 388
Species: Brown Trout

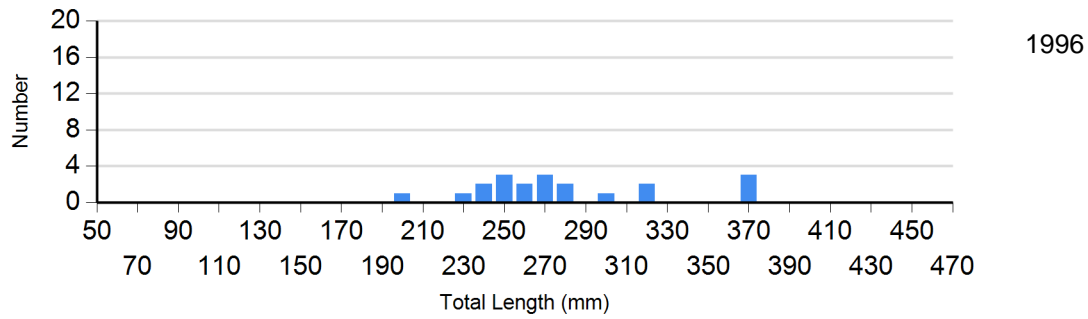




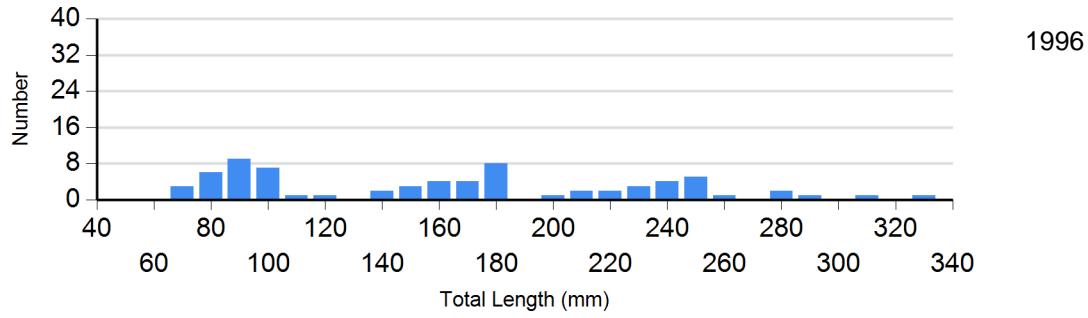
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Species: Brook Trout



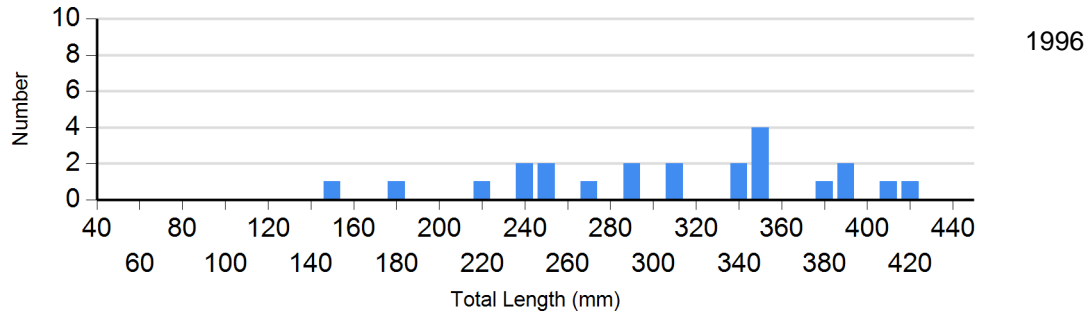
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Species: Brown Trout



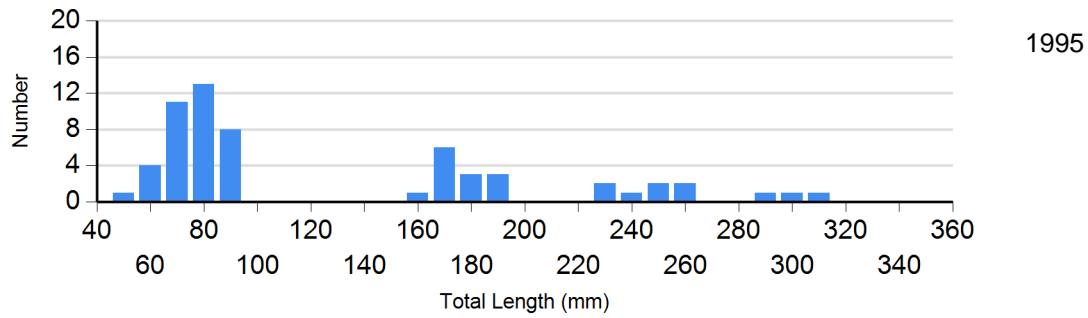
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Species: Brook Trout

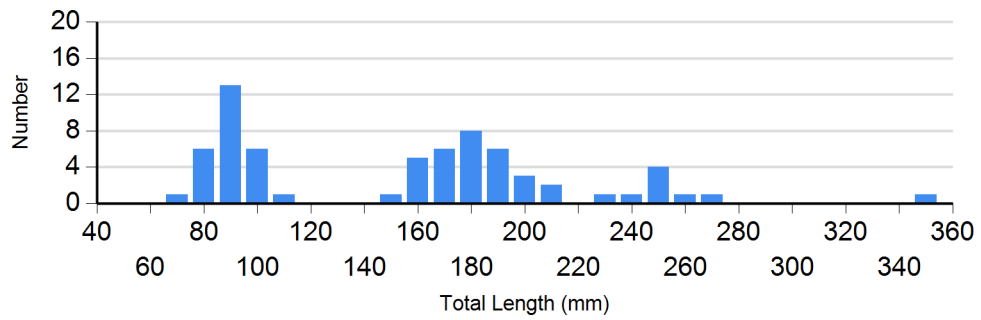


Site: 407
Species: Brown Trout

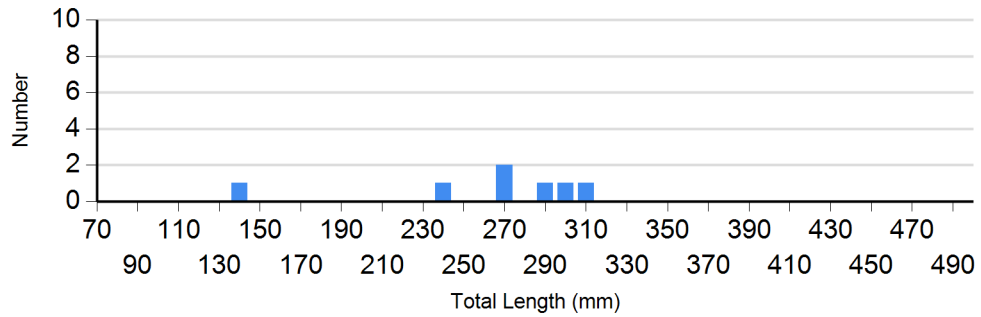


Site: 411
Species: Brook Trout

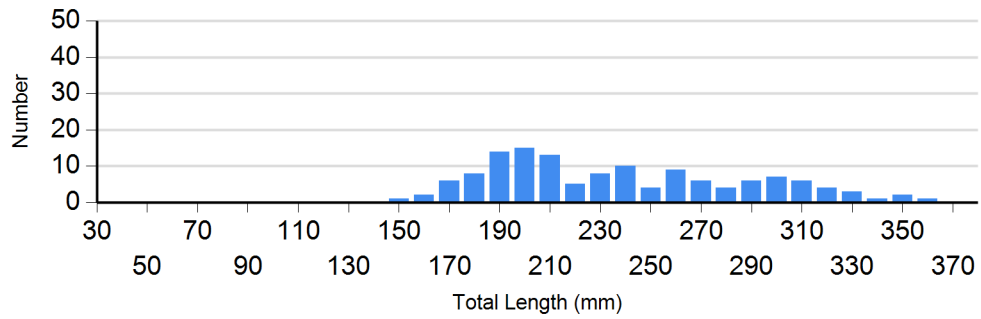




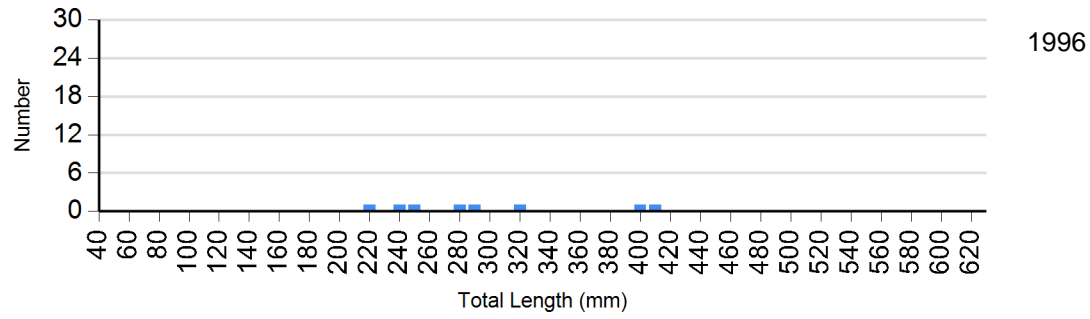
Site: 411
Species: Brown Trout



Site: 417
Species: Brook Trout



Site: 417
Species: Brown Trout



Site: 417
Species: White Sucker

