

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Whitewood Creek, Lawrence County
09-0056-00
2011

Table 1. Population and Biomass Estimates for Whitewood Creek

Site Number: 43
Site Midpoint (Latitude, Longitude): 44.62164896, -103.47136669
Survey Completed by: Unknown Consultant Firm for mining
Stream Classification: BR3

Date Sampled: 11/02/2011
Site Length (m):
Mean Width (m): 0.0
Number of Pass: 3
Conductivity (umhos/cm):
pH:
Water Temperature (C):
Voltage:

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	18	18	18	18	0	0	0	0	0.00	0	133.5	26.7
Brown Trout	>=200mm	5	5	5	5	0	0	0	0	0.00	0	301.4	302.6
Brown Trout	All	23	23	23	23	0	0	0	0	0.00	0	170.0	86.7
Creek Chub	All	454	457	461	454	0	0	0	0	0.00	0	92.7	28.5
Fathead Minnow	All	53	53	53	53	0	0	0	0	0.00	0	60.7	2.6
Longnose Dace	All	353	383	402	364	0	0	0	0	0.00	0	52.9	5.4
Mountain Sucker	All	101	102	105	101	0	0	0	0	0.00	0	63.6	27.2
Stone Cat	All	2	2	2	2	0	0	0	0	0.00	0	101.0	52.0
White Sucker	All	97	97	97	97	0	0	0	0	0.00	0	153.6	137.8

Site Number: 44
Site Midpoint (Latitude, Longitude): 44.62092026, -103.47188053
Survey Completed by: Unknown Consultant Firm for mining
Stream Classification: None

Date Sampled: 10/31/2011
Site Length (m):
Mean Width (m): 0.0
Number of Pass: 3
Conductivity (umhos/cm):
pH:
Water Temperature (C):
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)
Creek Chub	All	48	48	50	48	0	0	0	0	0.00	0	77.1	25.2
Mountain Sucker	All	24	24	26	24	0	0	0	0	0.00	0	112.0	25.6

Site Number: 131

Site Midpoint (Latitude, Longitude): 44.58943150, -103.52027768

Survey Completed by: Unknown Consultant Firm for mining

Stream Classification: None

Date Sampled: 11/01/2011

Site Length (m):

Mean Width (m): 0.0

Number of Pass: 3

Conductivity (umhos/cm):

pH:

Water Temperature (C):

Voltage:

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)
Creek Chub	All	48	48	50	48	0	0	0	0	0.00	0	77.1	25.4
Fathead Minnow	All	5	5	5	5	0	0	0	0	0.00	0	59.4	2.2
Green Sunfish	All	21	22	26	21	0	0	0	0	0.00	0	67.1	9.2
Longnose Dace	All	205	222	236	208	0	0	0	0	0.00	0	69.2	5.5
Mountain Sucker	All	24	24	26	24	0	0	0	0	0.00	0	112.0	24.5
Stone Cat	All	18	17	22	18	0	0	0	0	0.00	0	161.3	54.6
White Sucker	All	45	46	49	45	0	0	0	0	0.00	0	110.0	33.4

Site Number: 295

Site Midpoint (Latitude, Longitude): 44.51740810, -103.60458517

Survey Completed by: Unknown Consultant Firm for mining

Stream Classification: BR0

Date Sampled: 11/02/2011

Site Length (m): 100

Mean Width (m): 0.0

Number of Pass: 3

Conductivity (umhos/cm):

pH:

Water Temperature (C):

Voltage:

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	76	78	82	76	0	0	780	0	0.00	1255	125.7	21.0
Brown Trout	All	76	78	82	76	0	0	780	0	0.00	1255	125.7	21.0
Creek Chub	All	8	8	9	8	0	0	80	0	0.00	129	70.0	4.3
Fathead Minnow	All	24	24	25	24	0	0	240	0	0.00	386	61.1	3.1
Longnose Dace	All	245	489	721	257	0	0	4890	0	0.00	7868	63.7	3.1
Mountain Sucker	All	23	29	43	23	0	0	290	0	0.00	467	98.6	16.0
White Sucker	All	5	5	6	5	0	0	50	0	0.00	80	53.6	2.0

Site Number: 588

Site Midpoint (Latitude, Longitude): 44.36654564, -103.73424434

Survey Completed by: South Dakota Science and Technology Authority

Stream Classification: BK3, BR3

Date Sampled: 09/01/2011

Site Length (m): 100

Mean Width (m): 0.0

Number of Pass: 3

Conductivity (umhos/cm):

pH:

Water Temperature (C):

Voltage:

175

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	0	0	10	0	0.00	16	200.0	105.0
Brook Trout	All	1	1	1	1	0	0	10	0	0.00	16	200.0	105.0
Brown Trout	<200mm	59	64	72	59	0	0	640	0	0.00	1030	105.4	14.2
Brown Trout	>=200mm	15	22	44	15	0	0	220	0	0.00	354	277.7	236.0
Brown Trout	All	74	85	99	74	0	0	850	0	0.00	1368	140.3	59.2
Longnose Dace	All	3	3	5	3	0	0	30	0	0.00	48	110.3	16.3

Site Number: 599

Site Midpoint (Latitude, Longitude): 44.36363265, -103.73830179

Date Sampled: 08/31/2011

Site Length (m): 100

Conductivity (umhos/cm):

pH:

Survey Completed by: South Dakota Science and Technology Authority

Mean Width (m): 5.8

Water Temperature (C):

Stream Classification: BK3, BR1

Number of Pass: 3

Voltage:

175

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	5	1	17	0	10	7	0.09	16	97.0	6.0
Brook Trout	>=200mm	1	1	5	1	17	2	10	7	2.08	16	231.0	134.0
Brook Trout	All	2	1	2	2	17	1	10	7	1.08	16	164.0	70.0
Brown Trout	<200mm	118	124	132	118	2152	30	1240	871	26.72	1995	106.4	13.9
Brown Trout	>=200mm	27	27	28	27	469	104	270	190	93.12	434	268.4	222.6
Brown Trout	All	145	151	158	145	2620	138	1510	1061	123.45	2430	136.6	52.8
Mountain Sucker	All	2	2	2	2	35	4	20	14	3.64	32	201.0	117.5

Site Number: 612

Date Sampled: 08/30/2011

Conductivity (umhos/cm):

Site Midpoint (Latitude, Longitude): 44.35478049, -103.73811696

Site Length (m): 100

pH:

Survey Completed by: South Dakota Science and Technology Authority

Mean Width (m): 5.4

Water Temperature (C):

Stream Classification: BK2, BR1

Number of Pass: 3

Voltage:

180

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	28	31	38	28	575	13	310	233	11.28	499	116.9	22.0
Brook Trout	>=200mm	4	4	5	4	74	9	40	30	8.12	64	222.8	122.5
Brook Trout	All	32	35	42	32	650	22	350	263	20.03	563	130.2	34.5
Brown Trout	<200mm	114	122	131	114	2265	50	1220	917	44.68	1963	110.2	22.1
Brown Trout	>=200mm	22	22	23	22	408	72	220	165	64.55	354	257.0	177.0
Brown Trout	All	136	144	153	136	2673	126	1440	1083	112.55	2317	133.9	47.2

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 Whitewood Creek, 2001-2011

Site 43

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Sep 27, 2001	1	1-1	
	Oct 09, 2002	1	1-2	
	Oct 21, 2009	5	5-5	
	Nov 02, 2011	18	18-18	
Brown Trout >=200mm	Oct 09, 2002	2	2-2	BR3
	Oct 14, 2003	1	1-1	BR3
	Oct 12, 2006	3	3-4	BR2

Brown Trout >=200mm	Oct 21, 2009	8	8-8	BR3
	Nov 02, 2011	5	5-5	BR3
Creek Chub	Sep 27, 2001	170	165-176	
	Oct 09, 2002	49	48-52	
	Oct 14, 2003	9	9-9	
	Oct 21, 2009	213	209-218	
	Nov 02, 2011	457	454-461	
Fathead Minnow	Oct 21, 2009	1	1-1	
	Nov 02, 2011	53	53-53	
Longnose Dace	Sep 27, 2001	411	402-420	
	Oct 09, 2002	158	137-179	
	Oct 14, 2003	473	460-486	
	Oct 12, 2006	102	90-116	
	Oct 21, 2009	450	419-481	
	Nov 02, 2011	383	364-402	
Mountain Sucker	Sep 27, 2001	1	1-1	

Mountain Sucker	Oct 09, 2002	3	3-3
	Oct 14, 2003	1	1-1
	Oct 12, 2006	1	1-2
	Oct 21, 2009	42	42-44
	Nov 02, 2011	102	101-105
Stone Cat	Oct 09, 2002	2	2-3
	Oct 21, 2009	8	4-42
	Nov 02, 2011	2	2-2
White Sucker	Sep 27, 2001	43	43-44
	Oct 09, 2002	26	26-28
	Oct 14, 2003	8	8-8
	Oct 12, 2006	18	18-18
	Oct 21, 2009	58	58-59
	Nov 02, 2011	97	97-97

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout >=200mm	Oct 20, 2009	1	1-1	BR3
Creek Chub	Sep 26, 2001	3	3-3	
	Oct 15, 2003	5	5-5	
	Oct 20, 2009	8	8-10	
	Oct 31, 2011	48	48-50	
Fathead Minnow	Oct 15, 2003	12	12-12	
Green Sunfish	Oct 20, 2009	9	9-10	
Longnose Dace	Sep 26, 2001	54	54-56	
	Oct 10, 2002	7	7-8	
	Oct 15, 2003	118	113-125	
	Oct 20, 2009	108	89-130	
Mountain Sucker	Aug 17, 2009	3	3-3	
	Oct 20, 2009	11	11-11	
	Oct 31, 2011	24	24-26	
Stone Cat	Sep 26, 2001	13	13-15	

Stone Cat	Oct 10, 2002	2	2-3
	Oct 15, 2003	22	19-30
	Oct 20, 2009	87	56-137
White Sucker	Sep 26, 2001	5	5-5
	Oct 10, 2002	6	6-6
	Oct 15, 2003	8	8-9
	Oct 20, 2009	1	1-5

Site 131

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Oct 20, 2009	1	1-1	
Brown Trout >=200mm	Oct 11, 2006	1	1-1	BR3
Creek Chub	Sep 26, 2001	50	47-56	
	Oct 10, 2002	149	147-153	
	Oct 15, 2003	61	61-62	
	Oct 20, 2009	50	46-57	
	Nov 01, 2011	48	48-50	

Fathead Minnow	Oct 10, 2002	1	1-1
	Oct 15, 2003	8	8-9
	Oct 20, 2009	1	1-1
	Nov 01, 2011	5	5-5
Green Sunfish	Oct 10, 2002	1	1-1
	Oct 11, 2006	2	2-2
	Oct 20, 2009	4	4-6
	Nov 01, 2011	22	21-26
Longnose Dace	Sep 26, 2001	138	124-152
	Oct 10, 2002	64	62-68
	Oct 15, 2003	206	203-211
	Oct 11, 2006	7	7-9
	Oct 20, 2009	446	385-507
	Nov 01, 2011	222	208-236
Mountain Sucker	Oct 20, 2009	37	27-59
	Nov 01, 2011	24	24-26

Stone Cat	Sep 26, 2001	19	18-23
	Oct 10, 2002	3	3-4
	Oct 15, 2003	17	17-19
	Oct 11, 2006	3	3-3
	Oct 20, 2009	18	19-26
	Nov 01, 2011	17	18-22
White Sucker	Sep 26, 2001	40	40-42
	Oct 10, 2002	7	7-7
	Oct 15, 2003	3	3-3
	Oct 11, 2006	81	80-84
	Oct 20, 2009	58	34-112
	Nov 01, 2011	46	45-49

Site 295

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Sep 25, 2001	23	23-25	
	Oct 09, 2002	14	14-16	

Brown Trout <200mm	Oct 14, 2003	3	3-3	
	Oct 21, 2009	14	14-16	
	Nov 02, 2011	78	76-82	
Brown Trout >=200mm	Sep 25, 2001	2	2-2	BR3
	Oct 09, 2002	2	2-2	BR3
	Jun 23, 2009	1	1-1	BR3
	Oct 21, 2009	10	10-11	BR3
Creek Chub	Oct 09, 2002	22	15-44	
	Oct 14, 2003	2	2-4	
	Oct 21, 2009	35	35-36	
	Nov 02, 2011	8	8-9	
Fathead Minnow	Nov 02, 2011	24	24-25	
Longnose Dace	Sep 25, 2001	1131	801-1461	
	Oct 09, 2002	397	349-445	
	Oct 14, 2003	695	653-737	
	Oct 12, 2006	290	273-307	

Longnose Dace	Oct 21, 2009	4809	4172-5446
	Nov 02, 2011	489	257-721
Mountain Sucker	Sep 25, 2001	16	16-18
	Oct 09, 2002	6	6-7
	Oct 14, 2003	2	2-2
	Jun 23, 2009	24	24-24
	Oct 21, 2009	154	141-167
	Nov 02, 2011	29	23-43
Stone Cat	Sep 25, 2001	1	1-1
	Oct 21, 2009	4	4-4
White Sucker	Sep 25, 2001	186	185-189
	Oct 09, 2002	85	83-89
	Oct 14, 2003	14	14-15
	Oct 12, 2006	7	7-8
	Oct 12, 2006	73	73-75
	Oct 21, 2009	6	6-7

White Sucker

Nov 02, 2011

5

5-6

Site 588

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout >=200mm	Sep 01, 2011	1	1-1	BK3
Brown Trout <200mm	Jul 15, 2008	7	7-7	
	Sep 01, 2011	64	59-72	
Brown Trout >=200mm	Jul 15, 2008	33	33-33	BR1
	Sep 01, 2011	22	15-44	BR3
Longnose Dace	Sep 01, 2011	3	3-5	

Site 599

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Aug 31, 2011	1	1-5	
Brook Trout >=200mm	Aug 31, 2011	1	1-5	BK3
Brown Trout <200mm	Aug 31, 2011	124	118-132	
Brown Trout >=200mm	Aug 31, 2011	27	27-28	BR1
Mountain Sucker	Aug 31, 2011	2	2-2	

Site 612

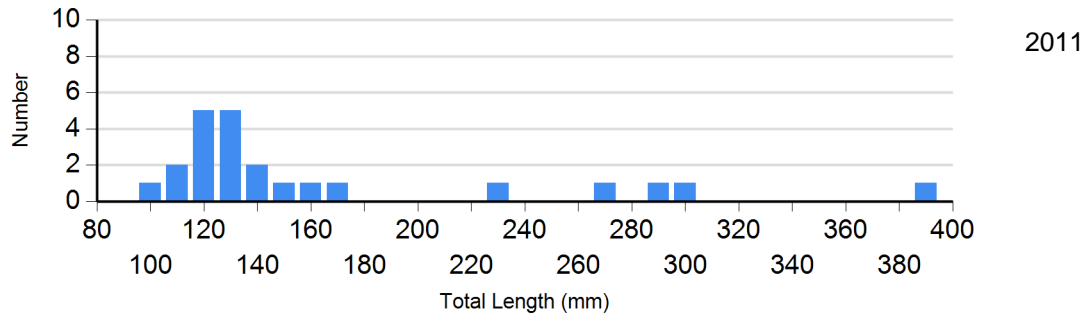
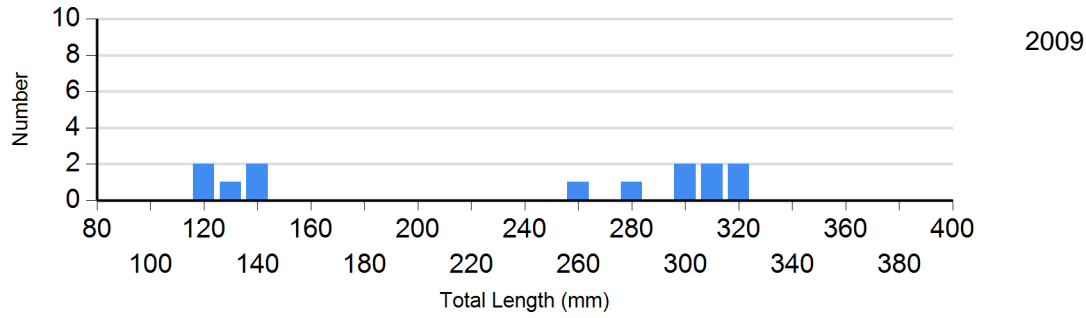
Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Aug 30, 2011	31	28-38	
Brook Trout >=200mm	Aug 30, 2011	4	4-5	BK2
Brown Trout <200mm	Aug 14, 2009	30	30-30	
	Aug 30, 2011	122	114-131	
Brown Trout >=200mm	Aug 14, 2009	22	22-22	BR1
	Aug 30, 2011	22	22-23	BR1

Length Frequency Distribution

Length frequency histogram of species sampled by year.

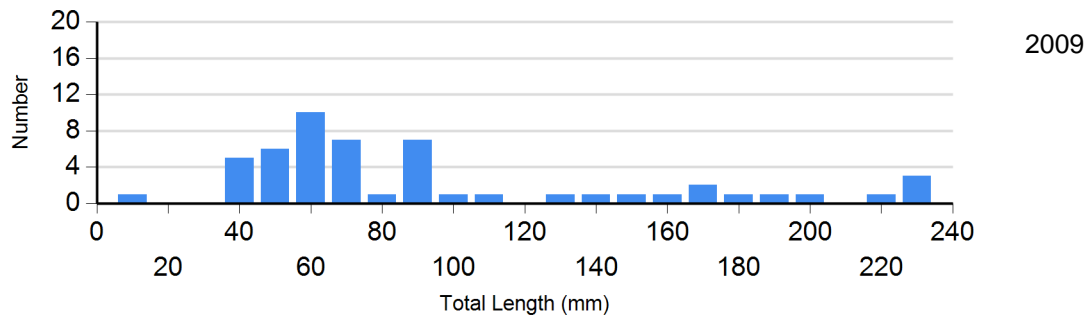
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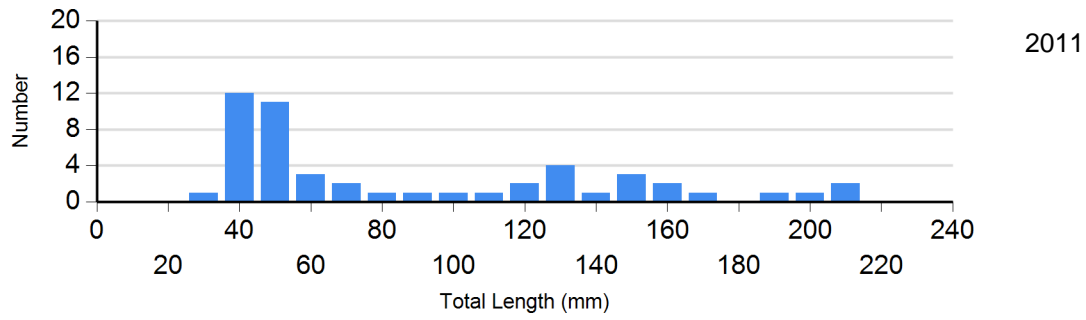
Species: Brown Trout



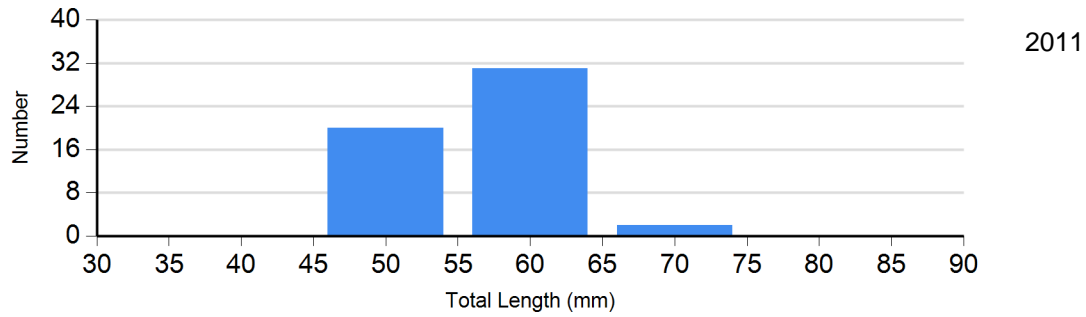
Site: 43

Species: Creek Chub

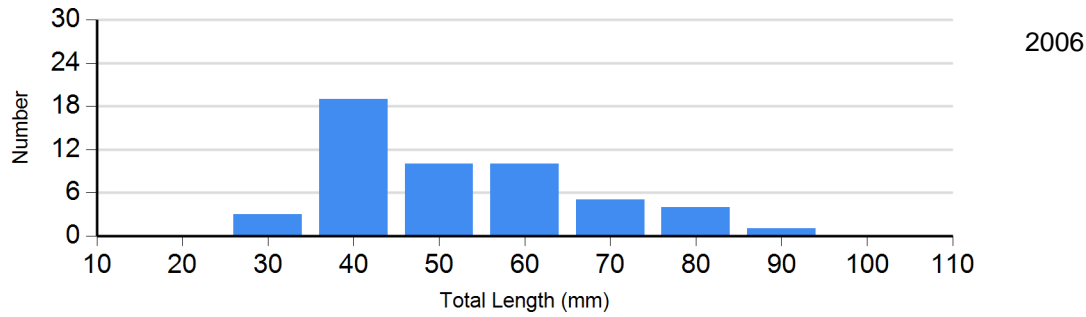


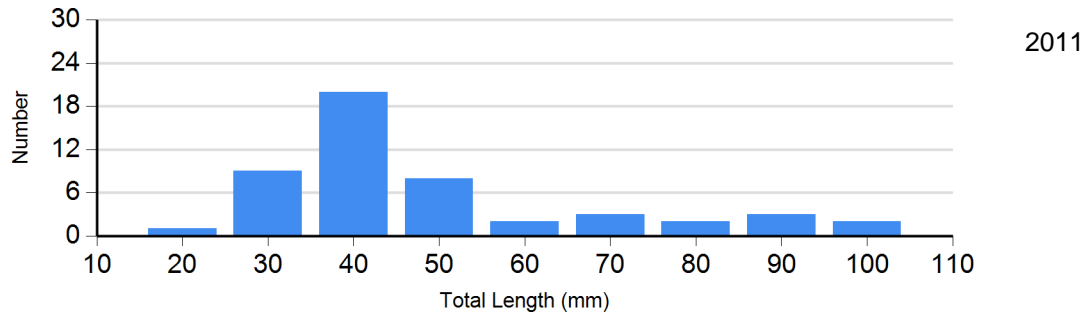
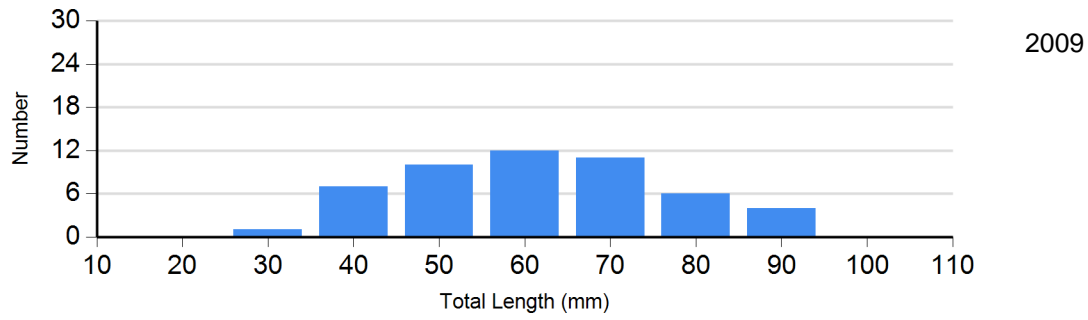


Site: 43
Species: Fathead Minnow

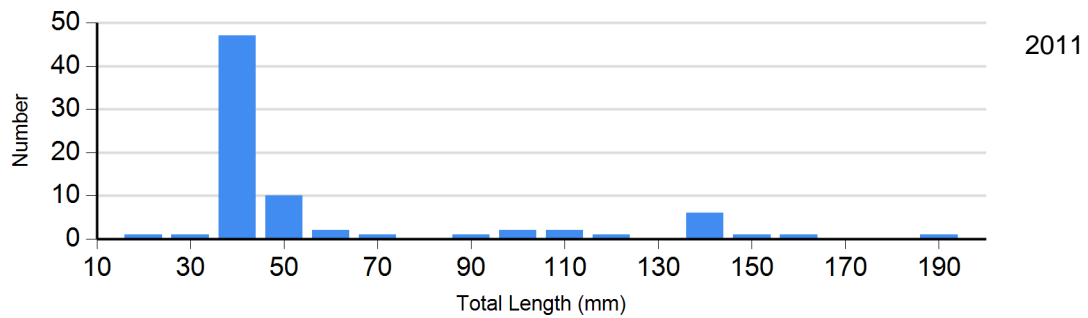
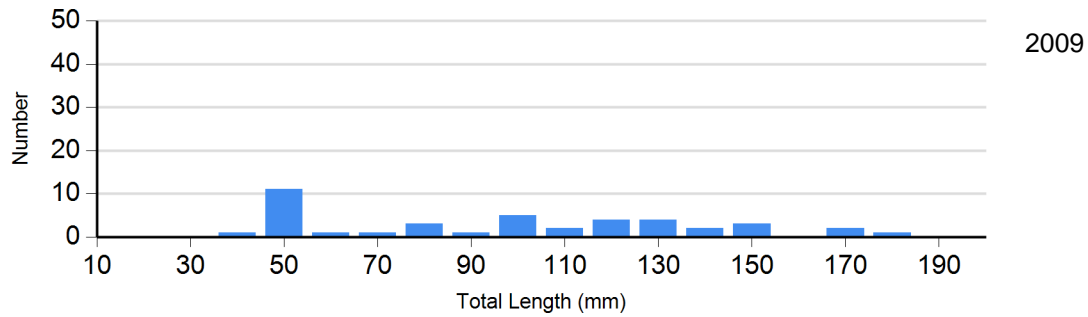


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Species: Longnose Dace

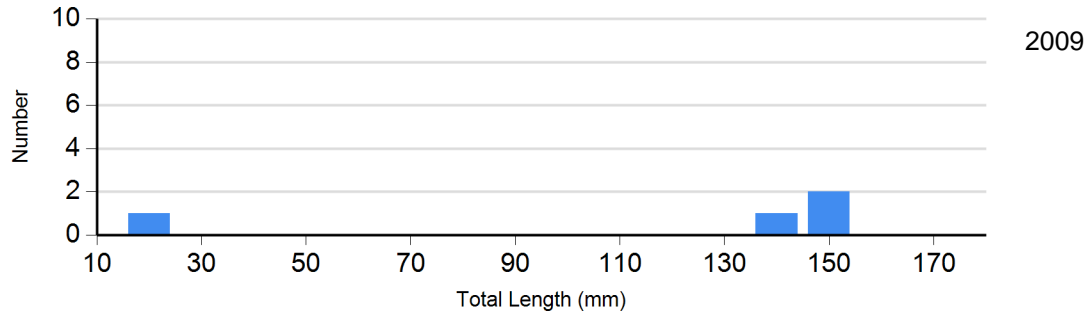




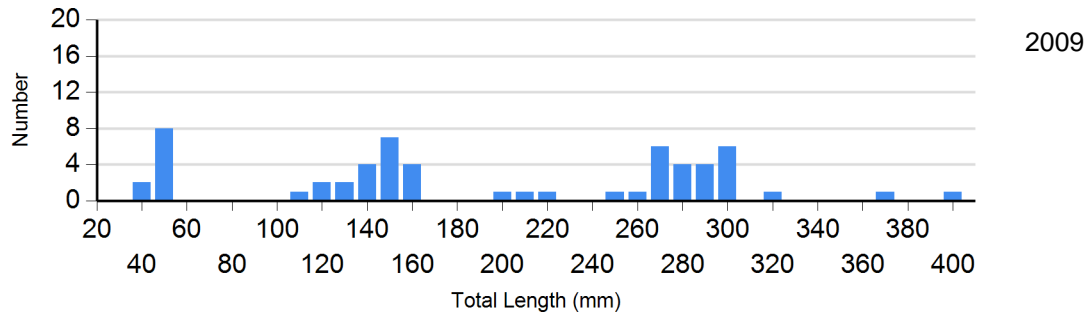
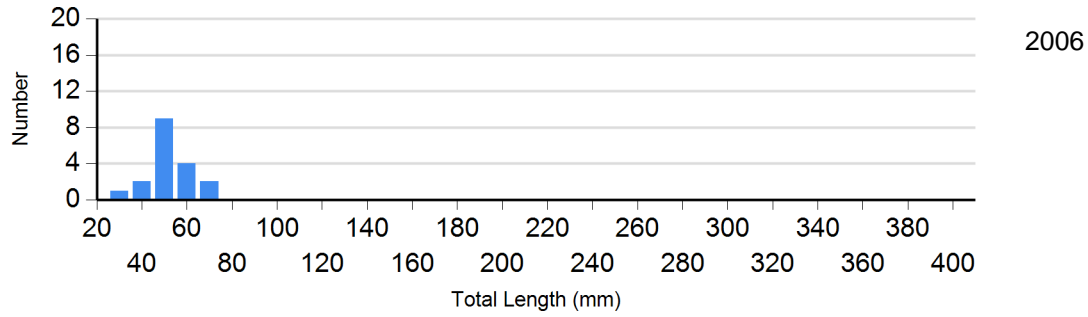
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Species: Mountain Sucker

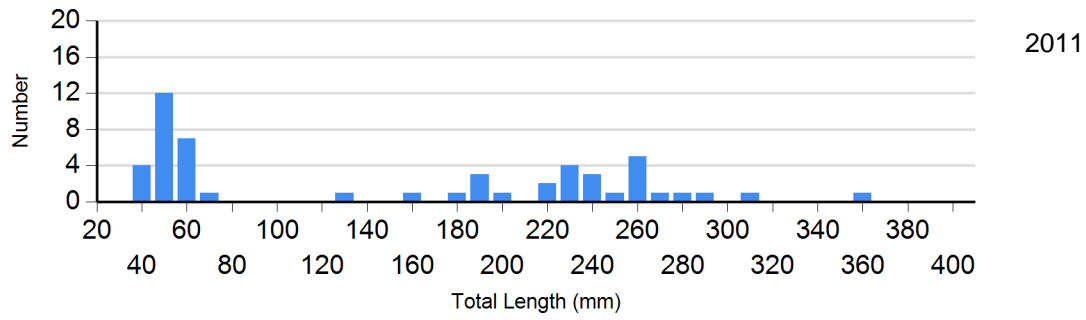


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Species: Stone Cat

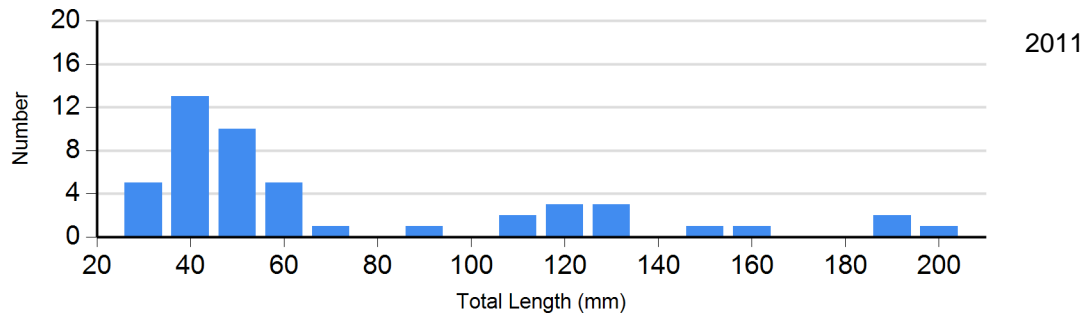
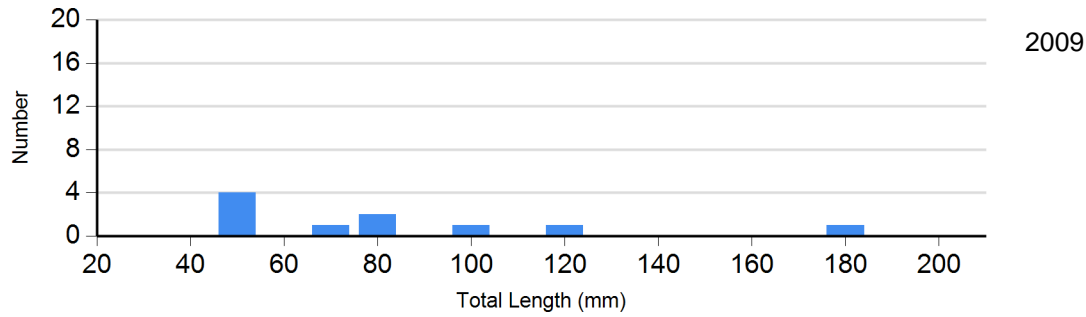


Site: 43
Species: White Sucker

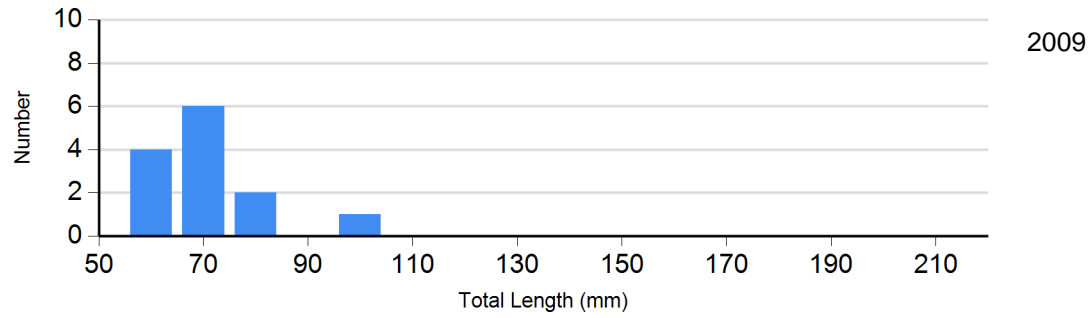




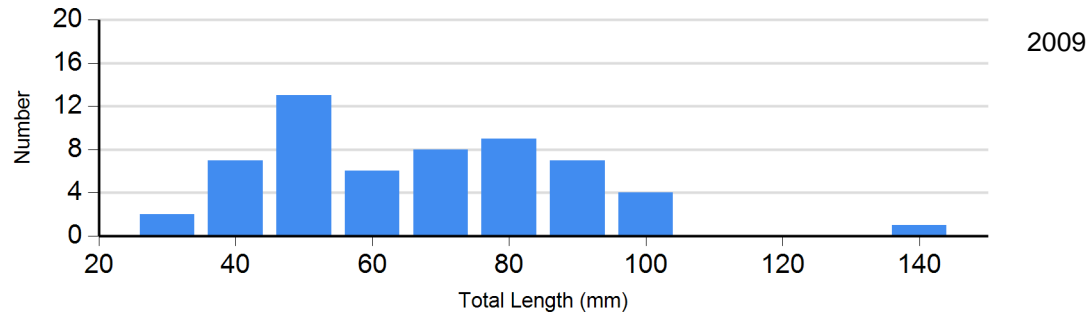
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Species: Creek Chub



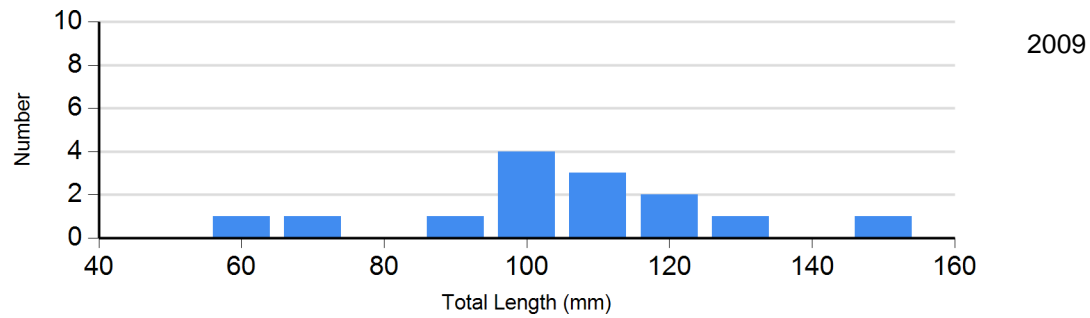
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Species: Green Sunfish

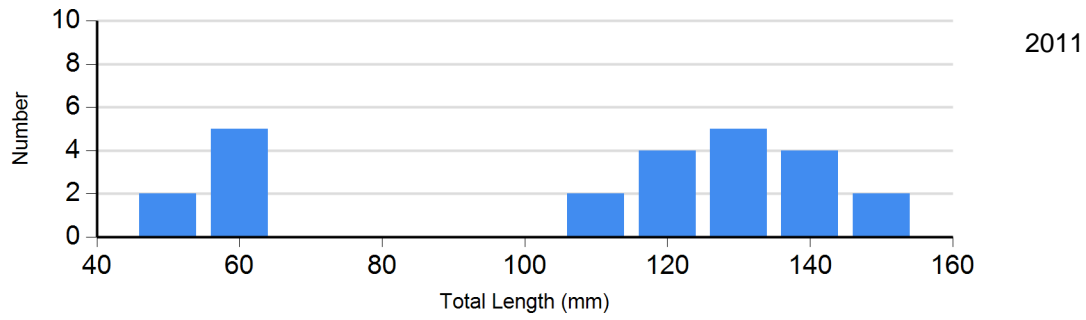


Site: 44
Species: Longnose Dace

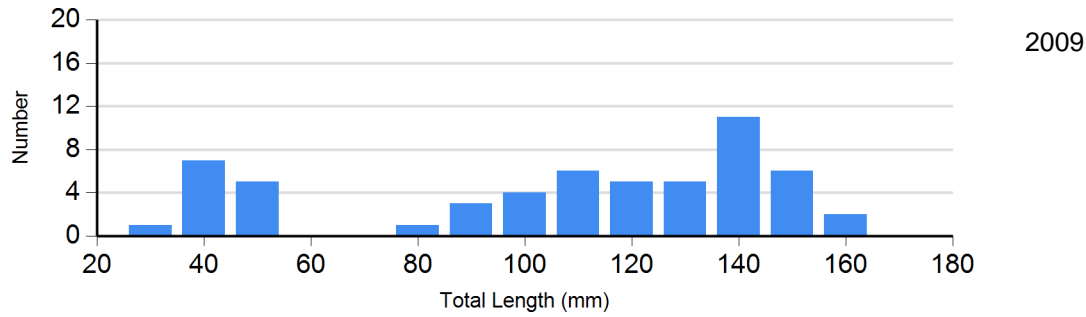


Site: 44
Species: Mountain Sucker

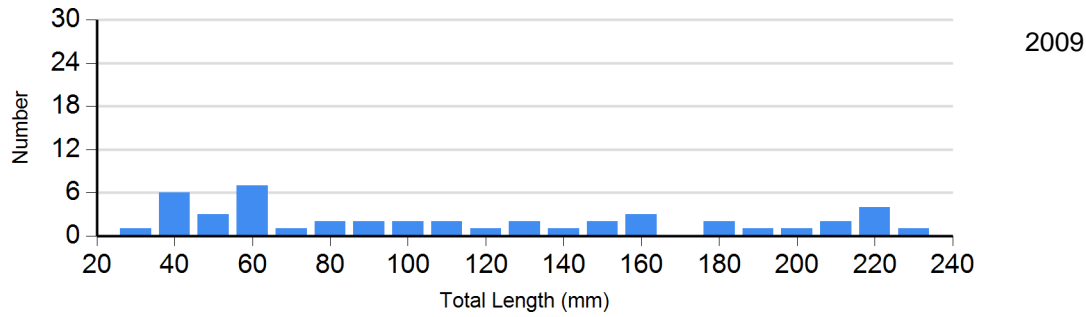


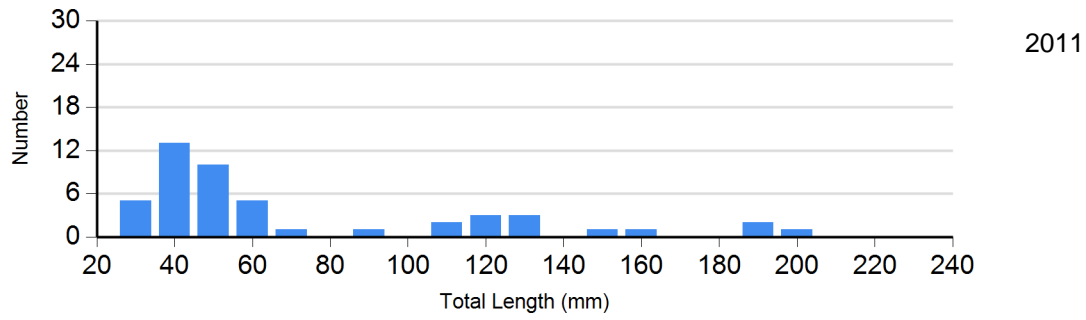


Site: 44
Species: Stone Cat

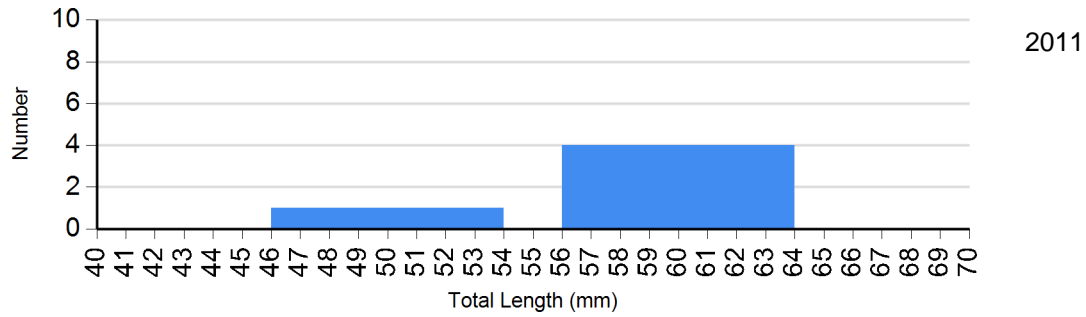


Site: 131
Species: Creek Chub

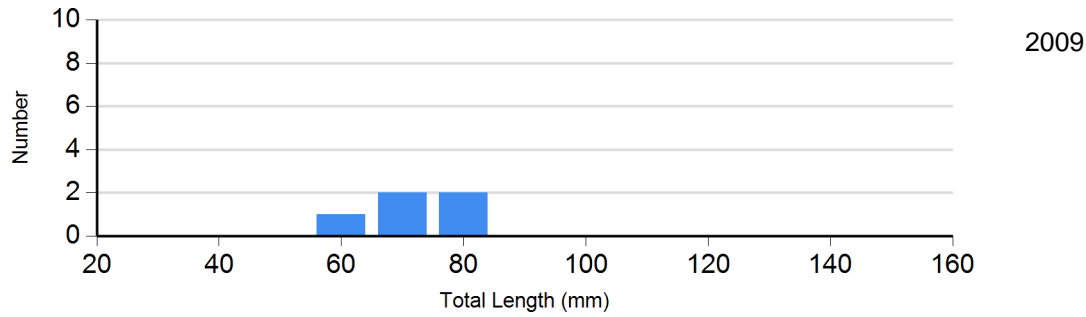


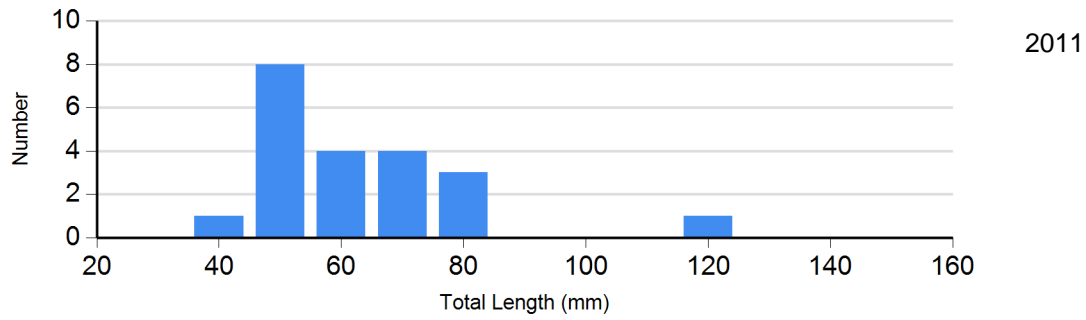


Site: 131
Species: Fathead Minnow

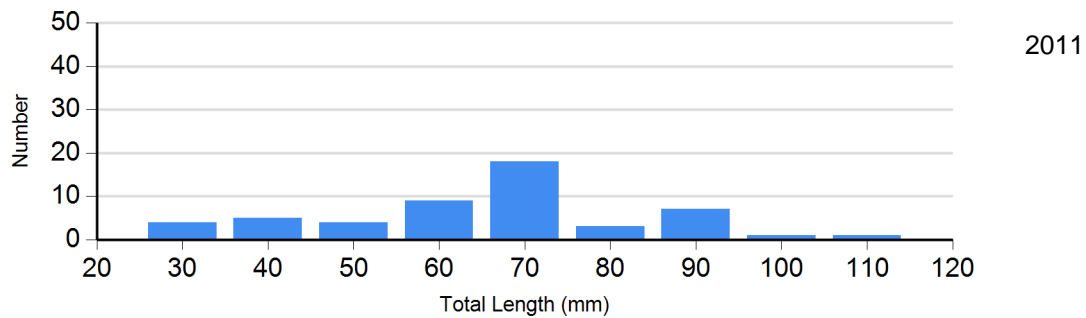
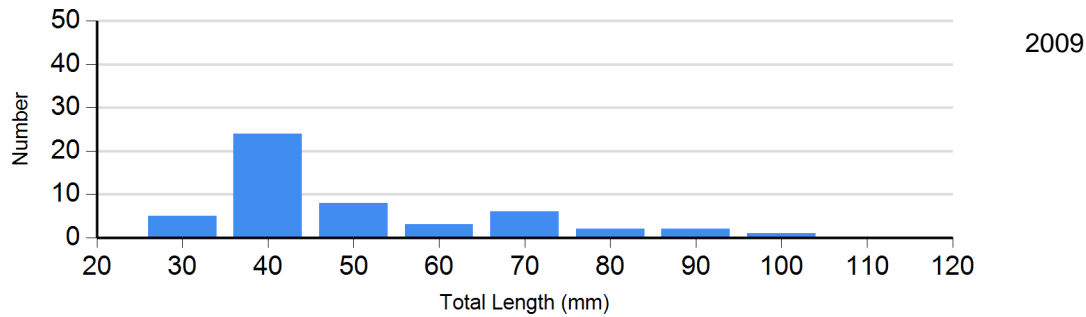
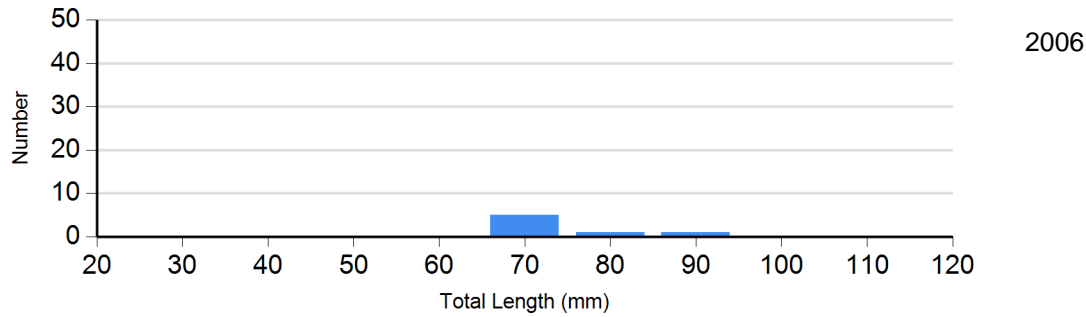


Site: 131
Species: Green Sunfish

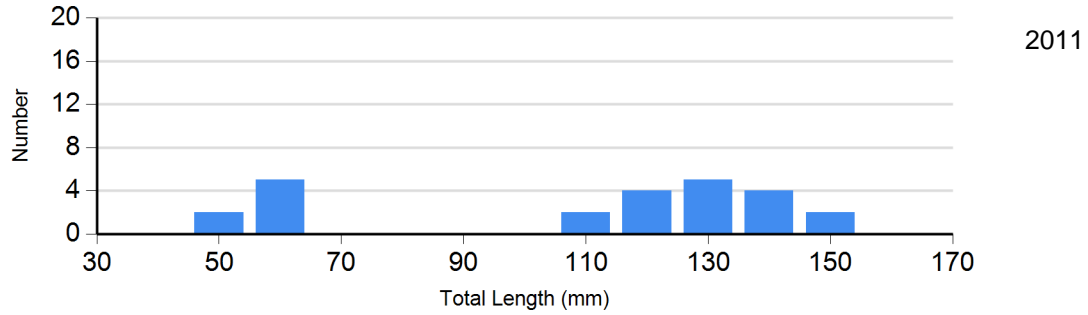
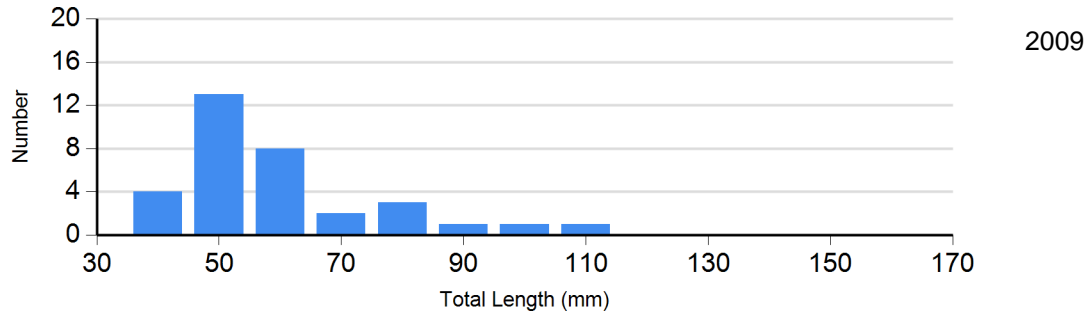




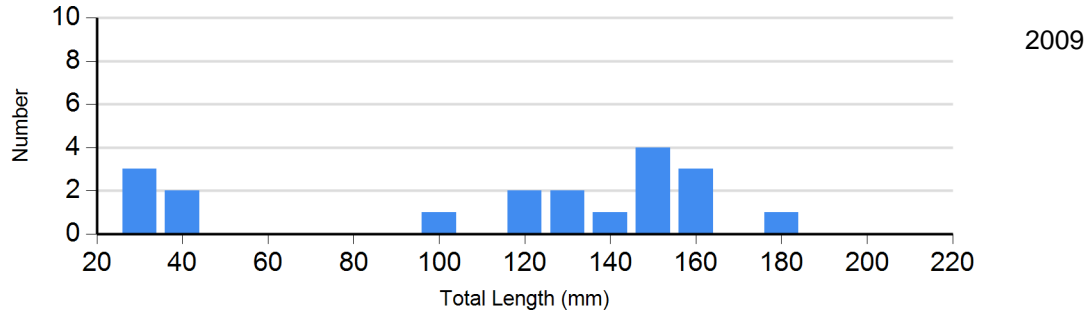
Site: 131
Species: Longnose Dace

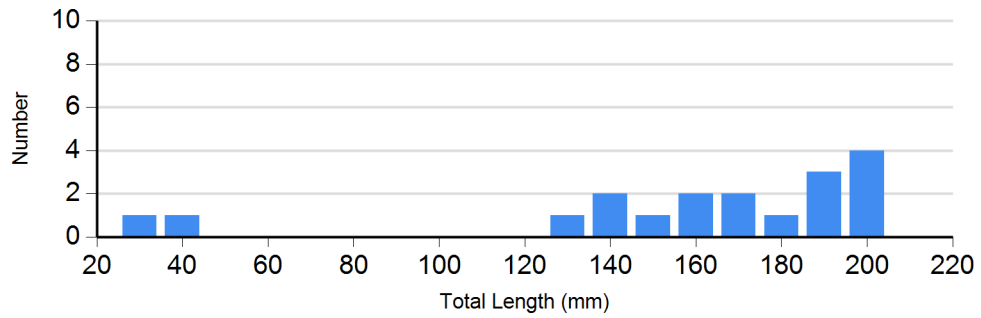


Site: 131
Species: Mountain Sucker



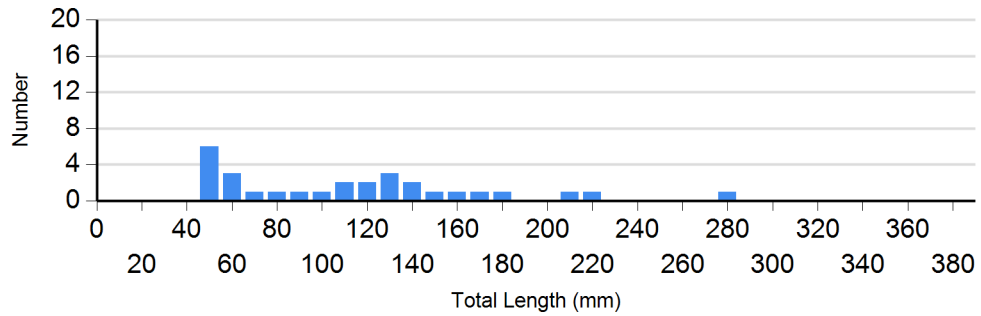
Site: 131
Species: Stone Cat



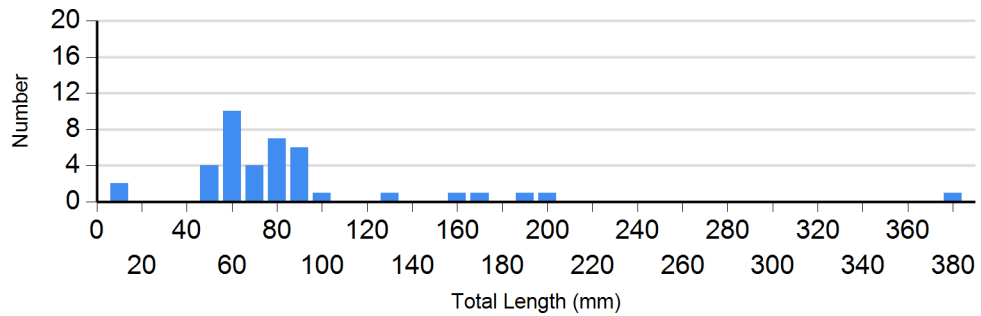


2011

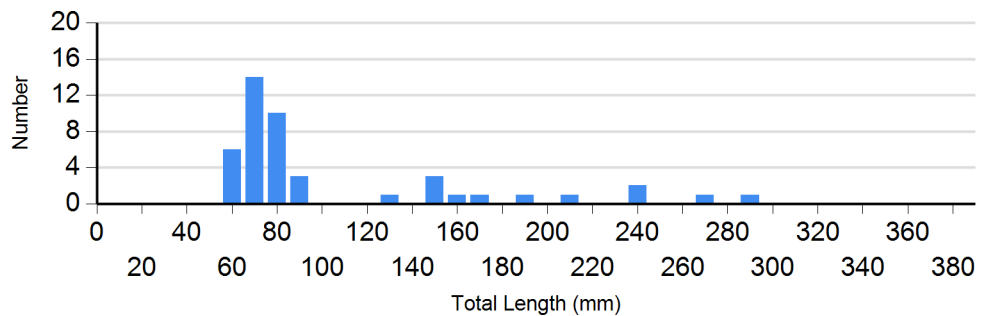
Site: 131
Species: White Sucker



2006

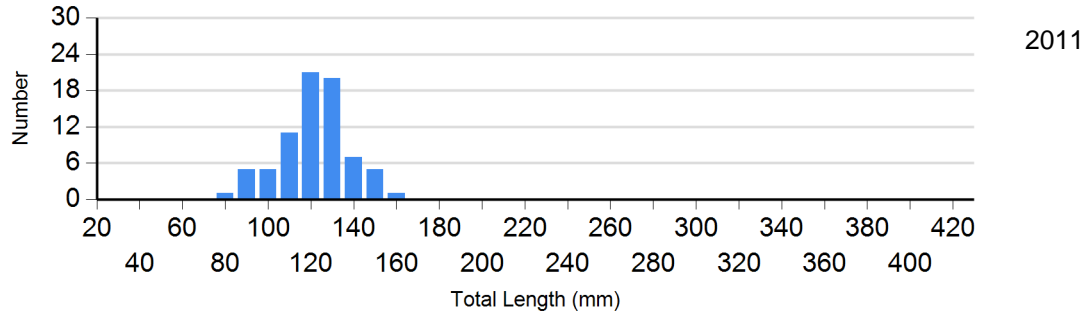
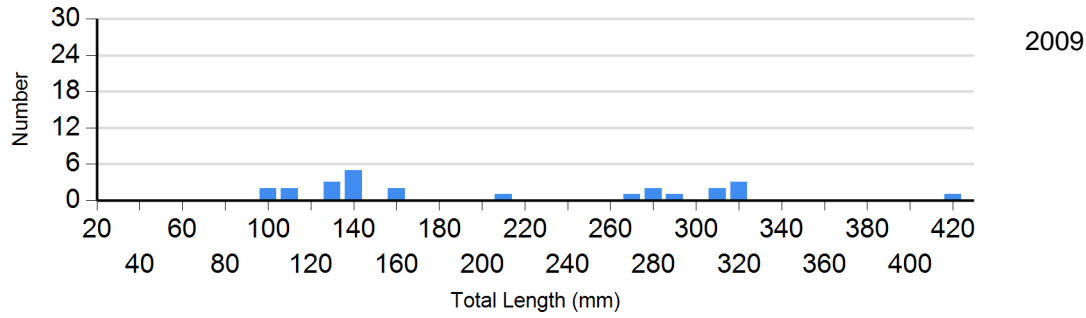


2009

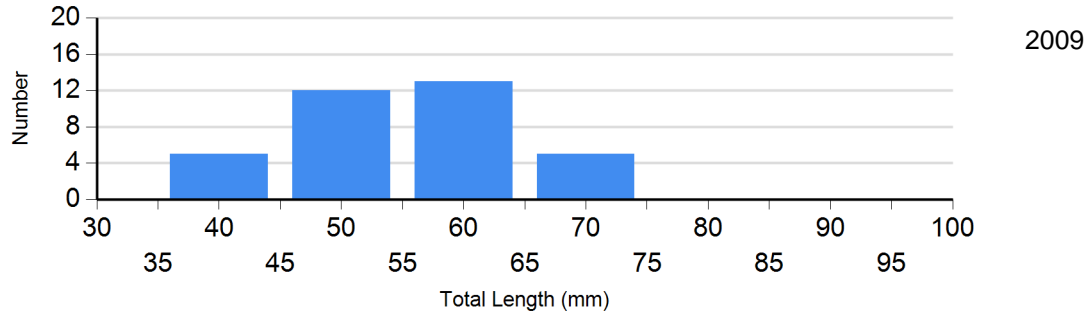


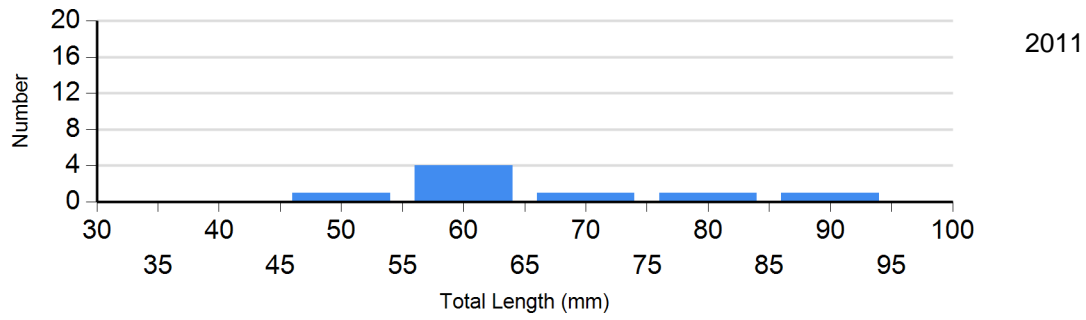
2011

Site: 295
Species: Brown Trout

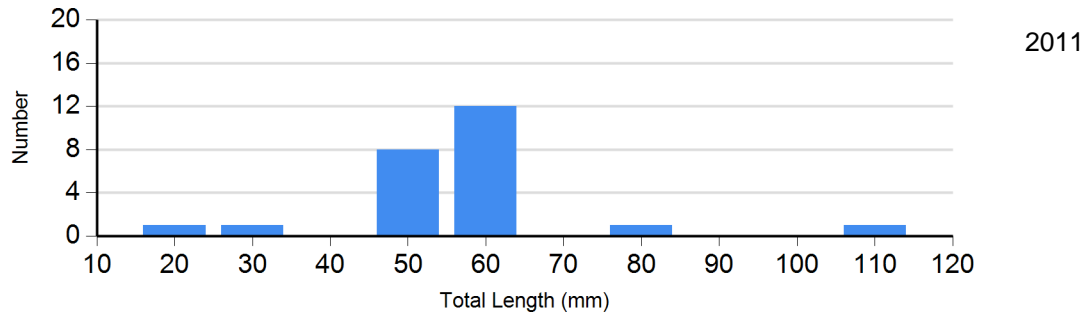


Site: 295
Species: Creek Chub

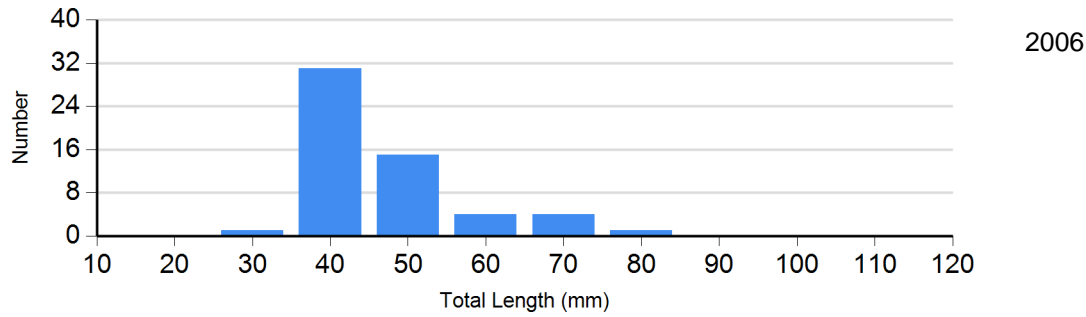


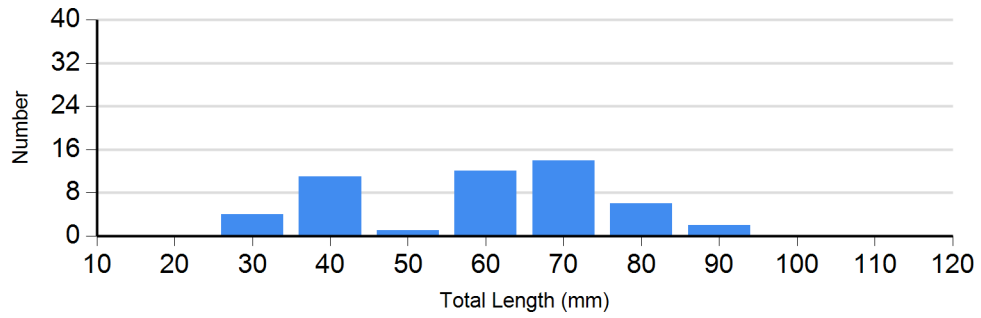
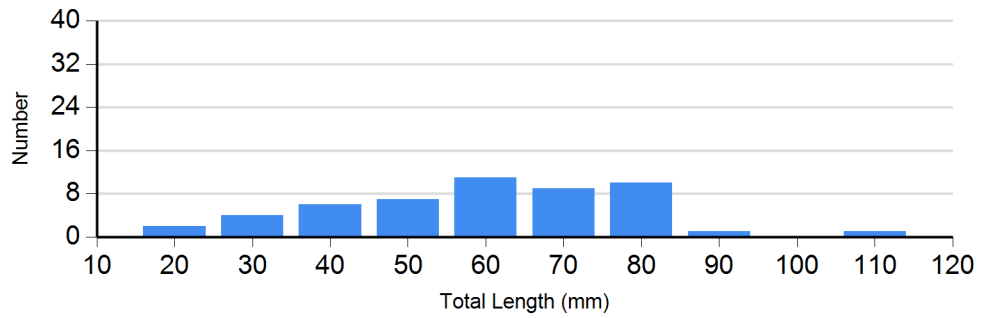


Site: 295
Species: Fathead Minnow

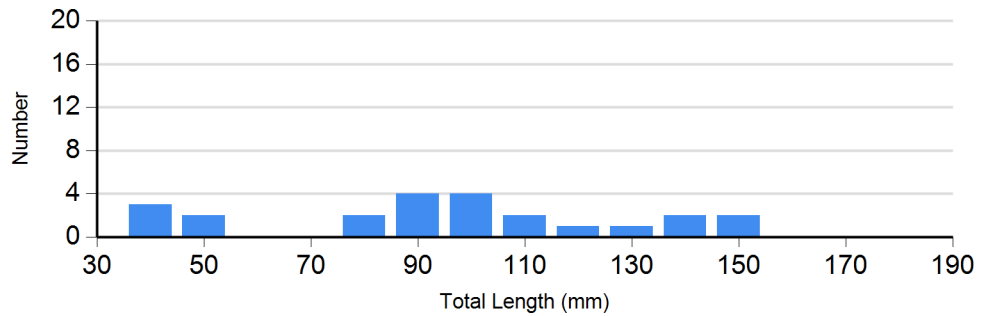
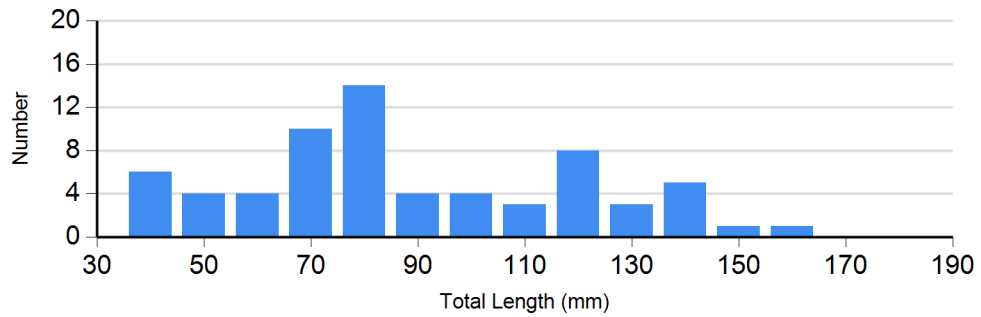


Site: 295
Species: Longnose Dace

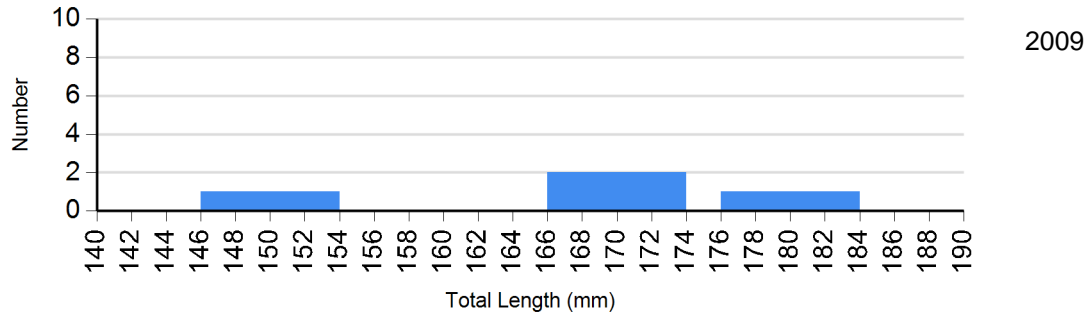




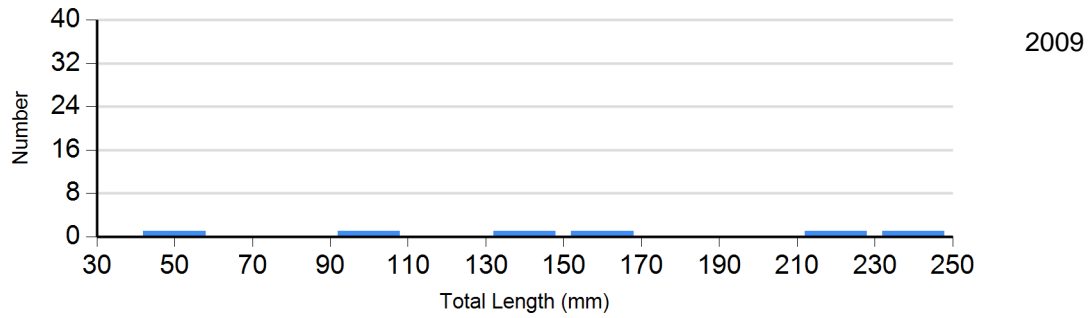
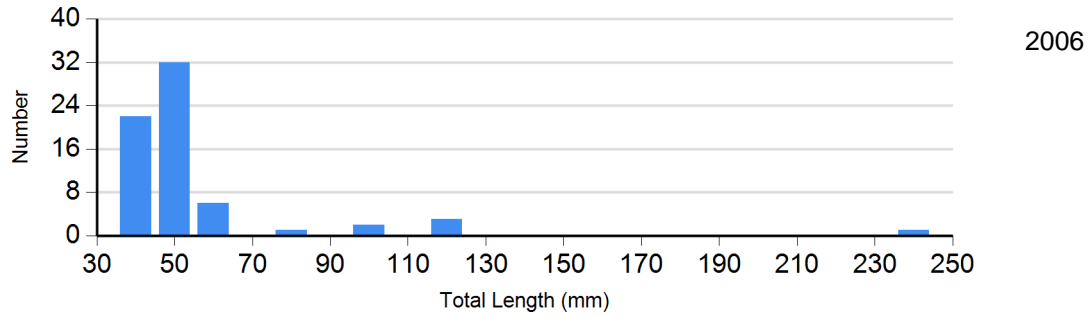
Site: 295
Species: Mountain Sucker

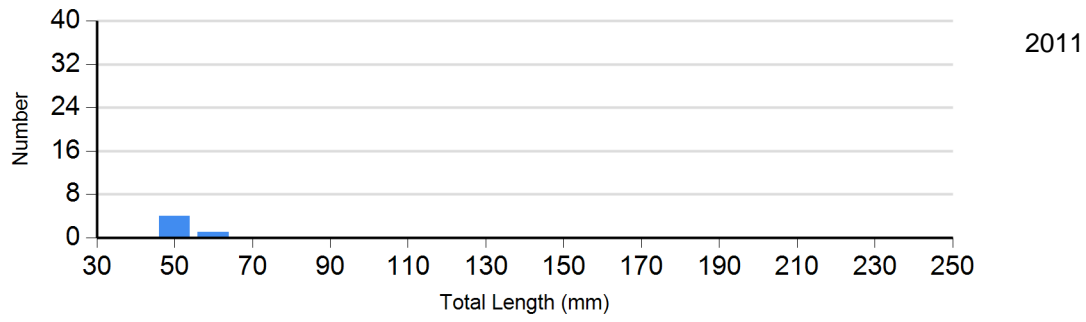


Site: 295
Species: Stone Cat

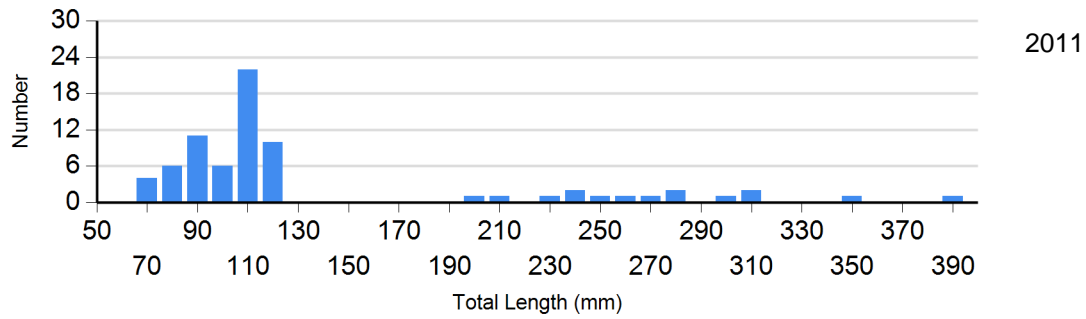
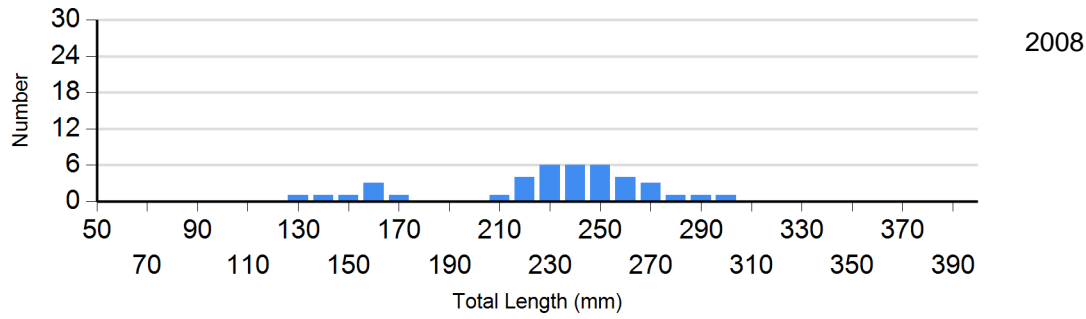


Site: 295
Species: White Sucker

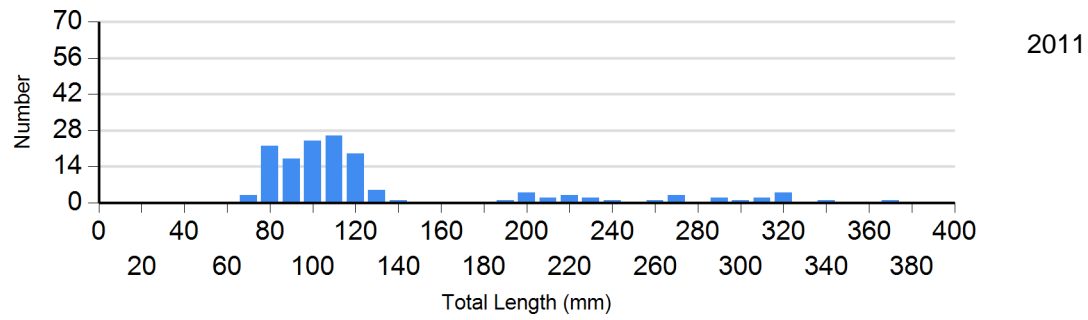




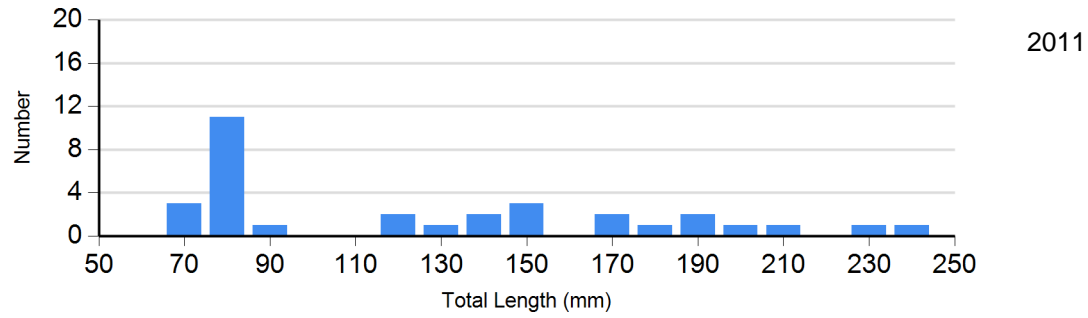
Site: 588
Species: Brown Trout



Site: 599
Species: Brown Trout



Site: 612
Species: Brook Trout



Site: 612
Species: Brown Trout

