

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Boxelder Creek, Pennington County
09-0065-00
2012

Table 1. Population and Biomass Estimates for Boxelder Creek

| | | |
|--|---------------------------------|-------------------------------------|
| Site Number: 1983 | Date Sampled: 06/20/2012 | Conductivity (umhos/cm): 320 |
| Site Midpoint (Latitude, Longitude): 44.15674459, -103.46614706 | Site Length (m): 100 | pH: 8.4 |
| Survey Completed by: South Dakota Game, Fish and Parks | Mean Width (m): 8.5 | Water Temperature (C): 18.2 |
| Stream Classification: BK3, BR2 | 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) |
|-----------------|------------|-----------------------|----------------|--------------|--------------|----------------|-----------------|----------|------------|--------------|------------|------------------|---------------------|
| Brook Trout | <200mm | 13 | 16 | 26 | 13 | 187 | 7 | 160 | 76 | 6.28 | 257 | 153.8 | 37.5 |
| Brook Trout | >=200mm | 5 | 5 | 5 | 5 | 59 | 6 | 50 | 24 | 5.51 | 80 | 211.6 | 105.4 |
| Brook Trout | All | 18 | 19 | 23 | 18 | 223 | 13 | 190 | 90 | 11.21 | 306 | 169.9 | 56.4 |
| Brown Trout | <200mm | 30 | 31 | 35 | 30 | 363 | 21 | 310 | 147 | 18.94 | 499 | 98.3 | 58.4 |
| Brown Trout | >=200mm | 16 | 16 | 16 | 16 | 187 | 31 | 160 | 76 | 28.02 | 257 | 253.9 | 167.4 |
| Brown Trout | All | 50 | 51 | 54 | 50 | 597 | 75 | 510 | 242 | 66.95 | 821 | 152.4 | 125.5 |
| Creek Chub | All | 1 | 1 | 2 | 1 | 12 | 0 | 10 | 5 | 0.32 | 16 | 112.0 | 31.0 |
| Mountain Sucker | All | 16 | 16 | 17 | 16 | 187 | 6 | 160 | 76 | 5.32 | 257 | 138.9 | 31.8 |
| Stone Cat | All | 19 | 18 | 25 | 19 | 211 | 6 | 180 | 85 | 5.23 | 290 | 139.4 | 27.8 |
| White Sucker | All | 5 | 5 | 7 | 5 | 59 | 1 | 50 | 24 | 1.09 | 80 | 116.2 | 20.8 |

| | | |
|--|---------------------------------|-------------------------------------|
| Site Number: 1989 | Date Sampled: 06/22/2012 | Conductivity (umhos/cm): 306 |
| Site Midpoint (Latitude, Longitude): 44.15898073, -103.47229427 | Site Length (m): 100 | pH: 8.3 |
| Survey Completed by: South Dakota Game, Fish and Parks | Mean Width (m): 10.2 | Water Temperature (C): |
| Stream Classification: BK3, BR2 | 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) |
|-----------------|------------|-----------------------|----------------|--------------|--------------|----------------|-----------------|----------|------------|--------------|------------|------------------|---------------------|
| Black Bullhead | All | 1 | 1 | 2 | 1 | 10 | 0 | 10 | 4 | 0.27 | 16 | 187.0 | 31.0 |
| Brook Trout | <200mm | 8 | 8 | 9 | 8 | 79 | 3 | 80 | 32 | 2.79 | 129 | 138.6 | 39.8 |
| Brook Trout | >=200mm | 3 | 3 | 3 | 3 | 29 | 3 | 30 | 12 | 2.81 | 48 | 215.0 | 107.0 |
| Brook Trout | All | 11 | 11 | 12 | 11 | 108 | 7 | 110 | 44 | 6.00 | 177 | 159.5 | 62.2 |
| Brown Trout | <200mm | 24 | 25 | 29 | 24 | 245 | 16 | 250 | 99 | 14.49 | 402 | 87.4 | 66.2 |
| Brown Trout | >=200mm | 20 | 21 | 25 | 20 | 206 | 51 | 210 | 83 | 45.58 | 338 | 277.4 | 247.7 |
| Brown Trout | All | 45 | 49 | 56 | 45 | 481 | 97 | 490 | 195 | 86.86 | 788 | 173.8 | 202.3 |
| Creek Chub | All | 2 | 2 | 3 | 2 | 20 | 0 | 20 | 8 | 0.33 | 32 | 130.5 | 19.0 |
| Mountain Sucker | All | 9 | 40 | 380 | 9 | 393 | 10 | 400 | 159 | 8.56 | 644 | 140.4 | 24.4 |
| Stone Cat | All | 10 | 9 | 15 | 10 | 88 | 3 | 90 | 36 | 2.56 | 145 | 150.4 | 32.5 |
| White Sucker | All | 125 | 143 | 161 | 125 | 1403 | 198 | 1430 | 568 | 177.03 | 2301 | 178.5 | 141.3 |

Site Number: 2099
Site Midpoint (Latitude, Longitude): 44.19841227, -103.53502386
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR3

Date Sampled: 06/20/2012
Site Length (m): 100
Mean Width (m): 6.6
Number of Pass: 3
Conductivity (umhos/cm): 262
pH: 8.6
Water Temperature (C): 18.6
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 | 57 | 57 | 58 | 57 | 859 | 29 | 570 | 348 | 25.76 | 917 | 142.7 | 33.6 |
| Brook Trout | >=200mm | 5 | 5 | 5 | 5 | 75 | 8 | 50 | 31 | 6.97 | 80 | 209.8 | 103.6 |
| Brook Trout | All | 62 | 62 | 63 | 62 | 934 | 37 | 620 | 378 | 32.73 | 998 | 148.1 | 39.2 |
| Brown Trout | <200mm | 51 | 63 | 81 | 51 | 949 | 46 | 630 | 384 | 41.44 | 1014 | 79.3 | 48.9 |
| Brown Trout | >=200mm | 1 | 1 | 2 | 1 | 15 | 3 | 10 | 6 | 2.29 | 16 | 250.0 | 170.0 |

| | | | | | | | | | | | | | |
|-----------------|-----|----|----|-----|----|------|----|-----|-----|-------|------|-------|------|
| Brown Trout | All | 52 | 65 | 85 | 52 | 979 | 60 | 650 | 397 | 53.35 | 1046 | 82.6 | 61.0 |
| Mountain Sucker | All | 49 | 78 | 130 | 49 | 1175 | 52 | 780 | 476 | 46.24 | 1255 | 152.9 | 44.1 |
| White Sucker | All | 1 | 1 | 5 | 1 | 15 | 1 | 10 | 6 | 0.71 | 16 | 160.0 | 53.0 |

Site Number: 2207

Site Midpoint (Latitude, Longitude): 44.22882427, -103.59960513

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK1

Date Sampled: 06/15/2012

Site Length (m): 100

Mean Width (m): 3.4

Number of Pass: 3

Conductivity (umhos/cm): 225

pH: 8.5

Water Temperature (C): 19.9

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 | 211 | 244 | 269 | 219 | 7235 | 206 | 2440 | 2930 | 184.01 | 3926 | 130.1 | 28.5 |
| Brook Trout | >=200mm | 13 | 16 | 26 | 13 | 474 | 47 | 160 | 192 | 41.74 | 257 | 210.5 | 98.5 |
| Brook Trout | All | 224 | 262 | 289 | 235 | 7768 | 264 | 2620 | 3146 | 235.41 | 4216 | 134.8 | 33.9 |
| Mountain Sucker | All | 5 | 6 | 13 | 5 | 178 | 9 | 60 | 72 | 7.97 | 97 | 167.8 | 50.2 |

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 Boxelder Creek, 2002-2012

Site 1983

| Species/Size | Date | Pop Est. | (95% C.I.) | Stream Classification |
|---------------------|--------------|----------|------------|-----------------------|
| Brook Trout <200mm | Aug 25, 2010 | 21 | 21-21 | |
| | Jun 20, 2012 | 16 | 13-26 | |
| Brook Trout >=200mm | Aug 25, 2010 | 7 | 7-7 | BK2 |
| | Jun 20, 2012 | 5 | 5-5 | BK3 |
| Brown Trout <200mm | Aug 25, 2010 | 18 | 18-18 | |
| | Jun 20, 2012 | 31 | 30-35 | |
| Brown Trout >=200mm | Aug 25, 2010 | 21 | 21-21 | BR2 |

| | | | | |
|---------------------|--------------|----|-------|-----|
| Brown Trout >=200mm | Jun 20, 2012 | 16 | 16-16 | BR2 |
| Creek Chub | Jun 20, 2012 | 1 | 1-2 | |
| Mountain Sucker | Aug 25, 2010 | 20 | 20-20 | |
| | Jun 20, 2012 | 16 | 16-17 | |
| Stone Cat | Aug 25, 2010 | 6 | 6-6 | |
| | Jun 20, 2012 | 18 | 19-25 | |
| White Sucker | Aug 25, 2010 | 28 | 28-28 | |
| | Jun 20, 2012 | 5 | 5-7 | |

Site 1989

| Species/Size | Date | Pop Est. | (95% C.I.) | Stream Classification |
|---------------------|--------------|-----------------|-------------------|------------------------------|
| Black Bullhead | Jun 22, 2012 | 1 | 1-2 | |
| Brook Trout <200mm | Jun 22, 2012 | 8 | 8-9 | |
| Brook Trout >=200mm | Jun 22, 2012 | 3 | 3-3 | BK3 |
| Brown Trout <200mm | Jun 22, 2012 | 25 | 24-29 | |
| Brown Trout >=200mm | Jun 22, 2012 | 21 | 20-25 | BR2 |
| Creek Chub | Jun 22, 2012 | 2 | 2-3 | |

| | | | |
|-----------------|--------------|-----|---------|
| Mountain Sucker | Jun 22, 2012 | 40 | 9-380 |
| Stone Cat | Jun 22, 2012 | 9 | 10-15 |
| White Sucker | Jun 22, 2012 | 143 | 125-161 |

Site 2099

| Species/Size | Date | Pop Est. | (95% C.I.) | Stream Classification |
|---------------------|--------------|-----------------|-------------------|------------------------------|
| Brook Trout <200mm | Jun 20, 2012 | 57 | 57-58 | |
| Brook Trout >=200mm | Jun 20, 2012 | 5 | 5-5 | BK2 |
| Brown Trout <200mm | Jun 20, 2012 | 63 | 51-81 | |
| Brown Trout >=200mm | Jun 20, 2012 | 1 | 1-2 | BR3 |
| Mountain Sucker | Jun 20, 2012 | 78 | 49-130 | |
| White Sucker | Jun 20, 2012 | 1 | 1-5 | |

Site 2207

| Species/Size | Date | Pop Est. | (95% C.I.) | Stream Classification |
|---------------------|--------------|-----------------|-------------------|------------------------------|
| Brook Trout <200mm | Aug 25, 2010 | 29 | 29-29 | |
| | Jun 15, 2012 | 244 | 219-269 | |
| Brook Trout >=200mm | Aug 25, 2010 | 9 | 9-9 | BK2 |
| | Jun 15, 2012 | 16 | 13-26 | BK1 |

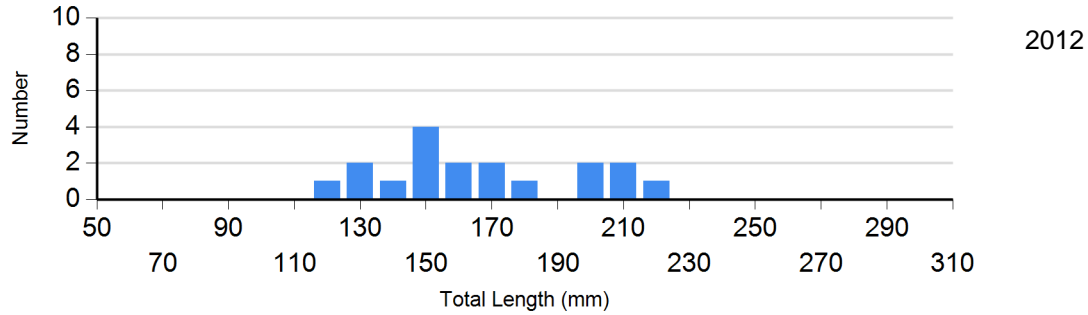
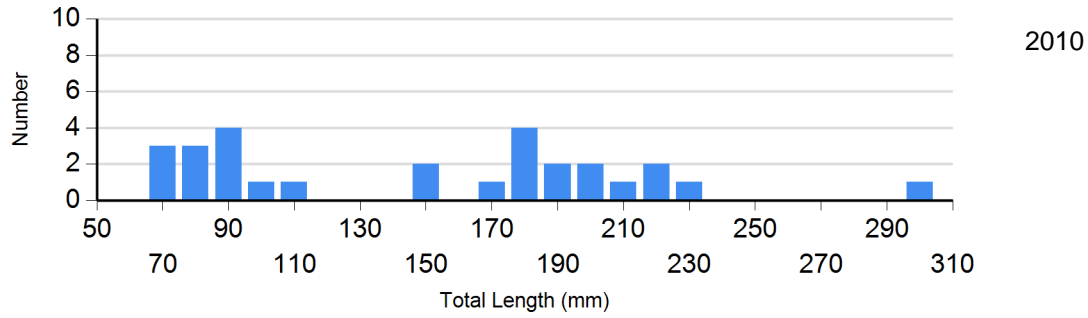
| | | | |
|-----------------|--------------|---|------|
| Mountain Sucker | Aug 25, 2010 | 4 | 4-4 |
| | Jun 15, 2012 | 6 | 5-13 |
| White Sucker | Aug 25, 2010 | 1 | 1-1 |

Length Frequency Distribution

Length frequency histogram of species sampled by year.

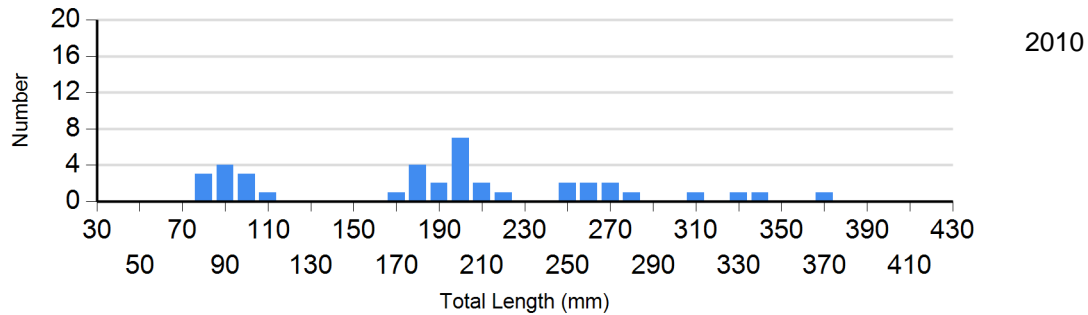
Site: 1983

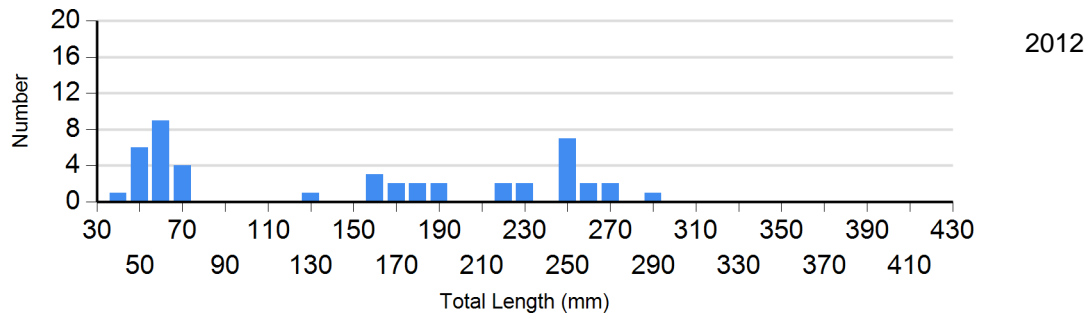
Species: Brook Trout



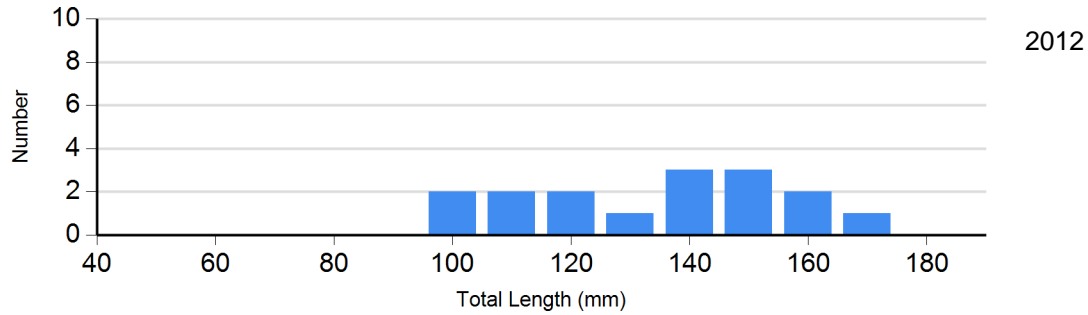
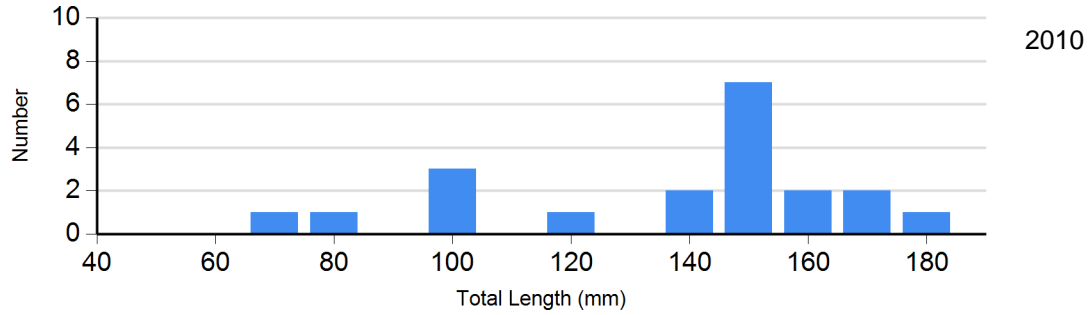
Site: 1983

Species: Brown Trout

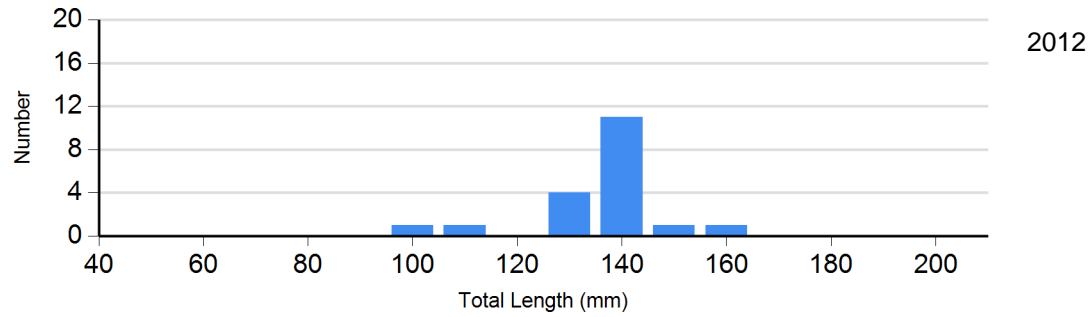
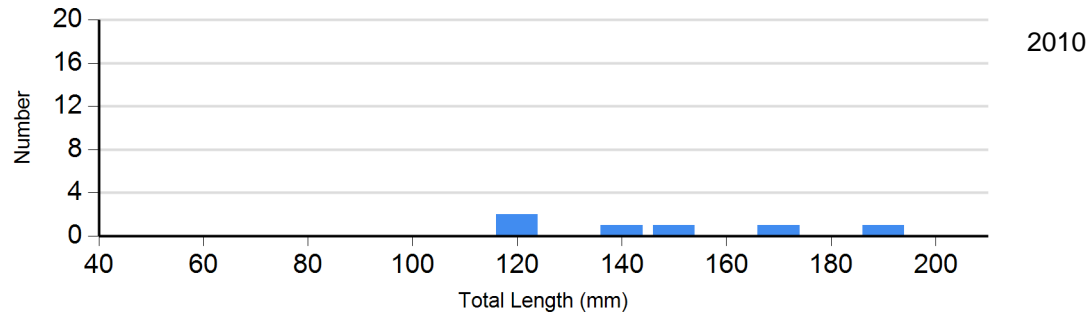




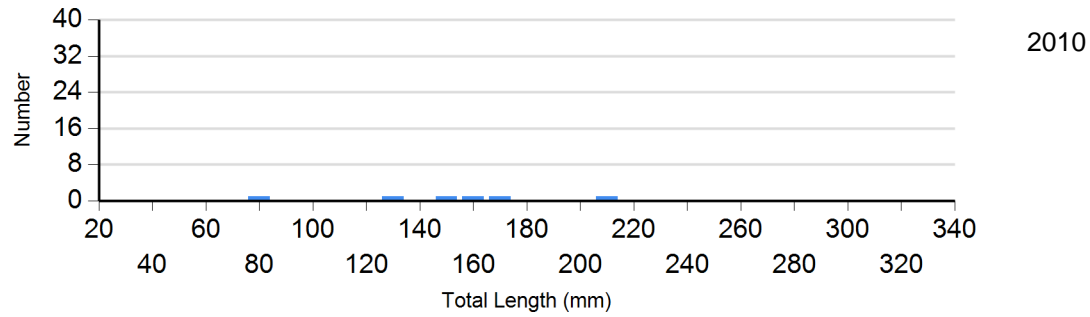
Site: 1983
Species: Mountain Sucker

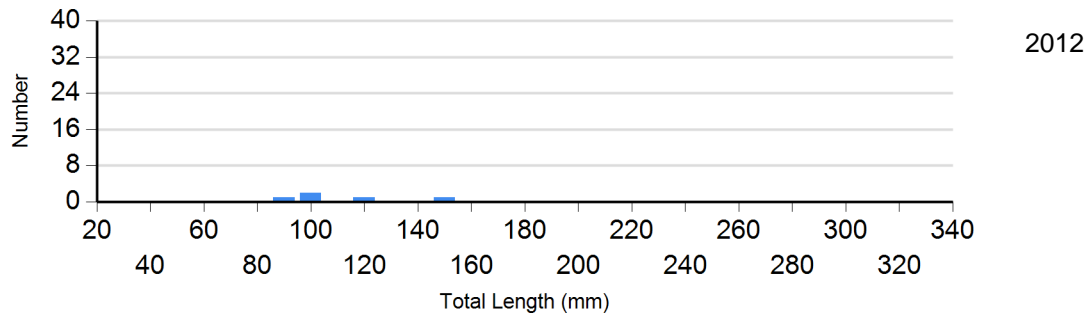


Site: 1983
Species: Stone Cat

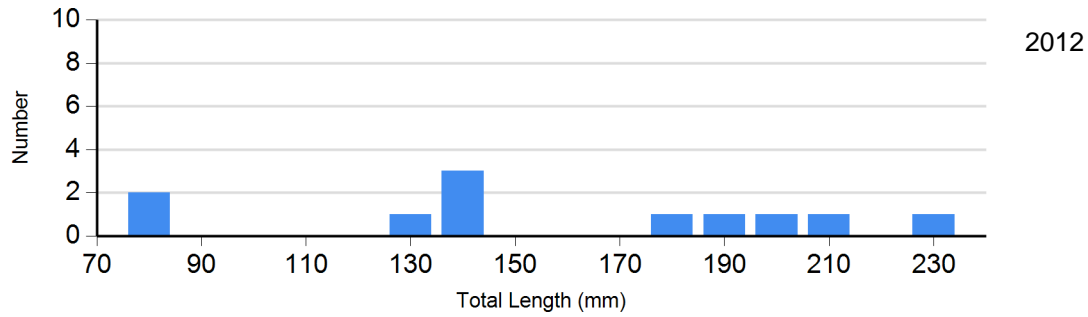


Site: 1983
Species: White Sucker

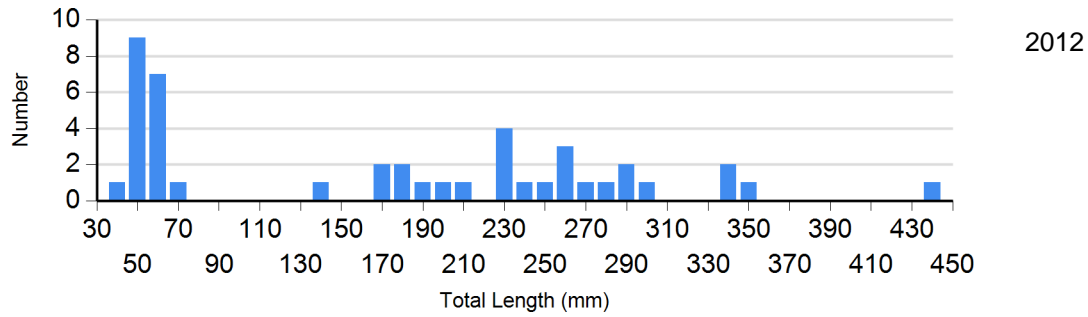




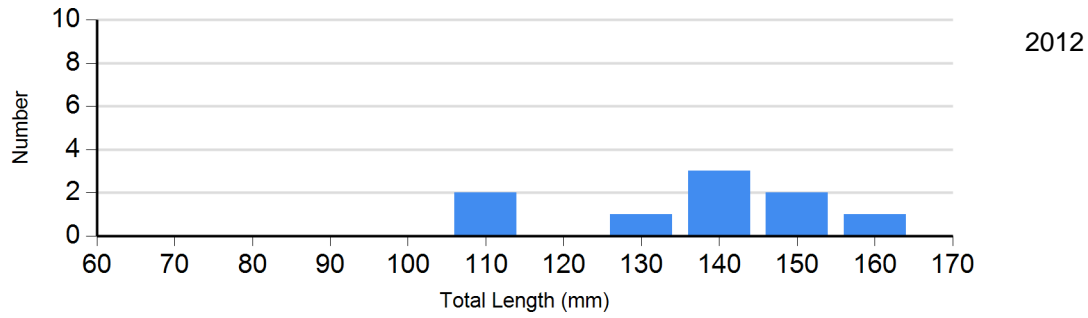
Site: 1989
Species: Brook Trout



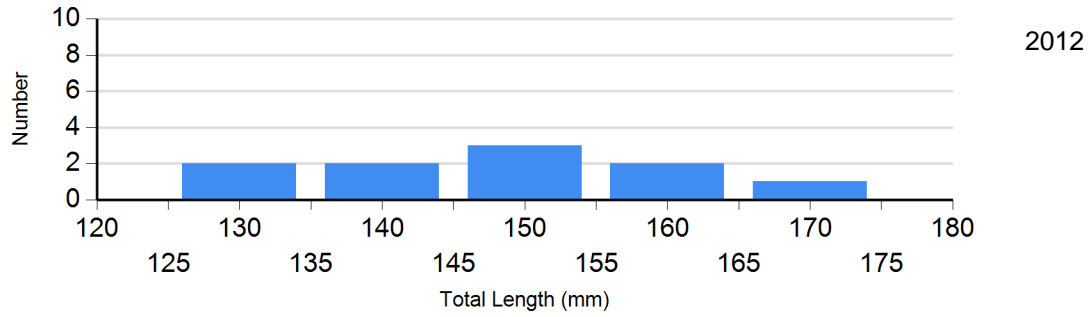
Site: 1989
Species: Brown Trout



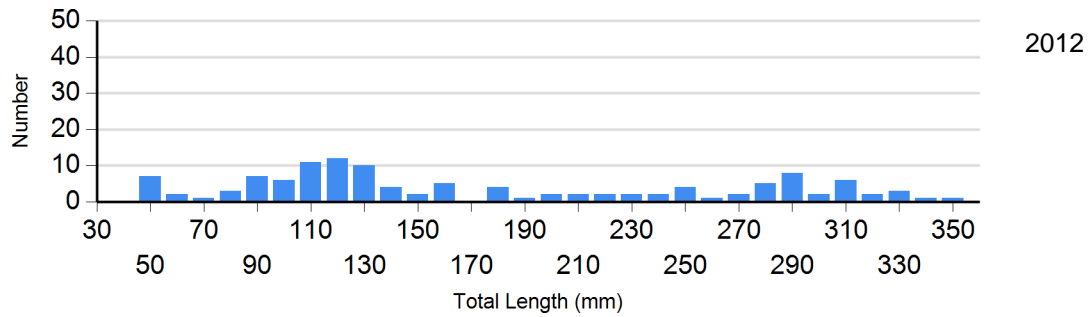
Site: 1989
Species: Mountain Sucker



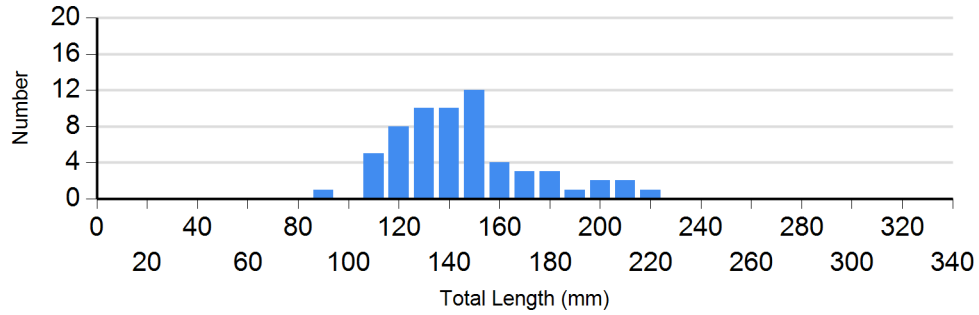
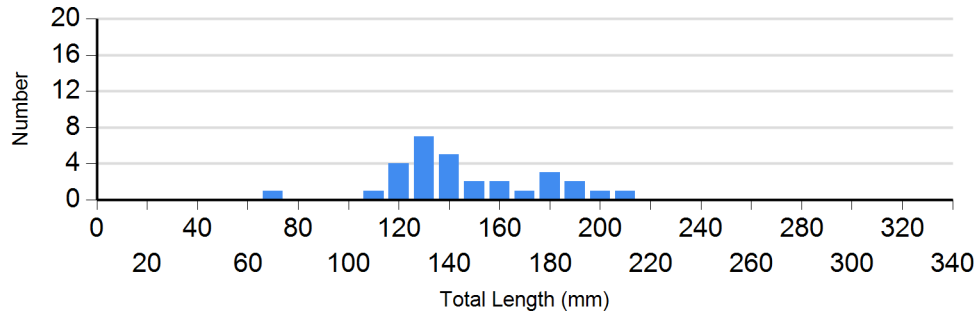
Site: 1989
Species: Stone Cat



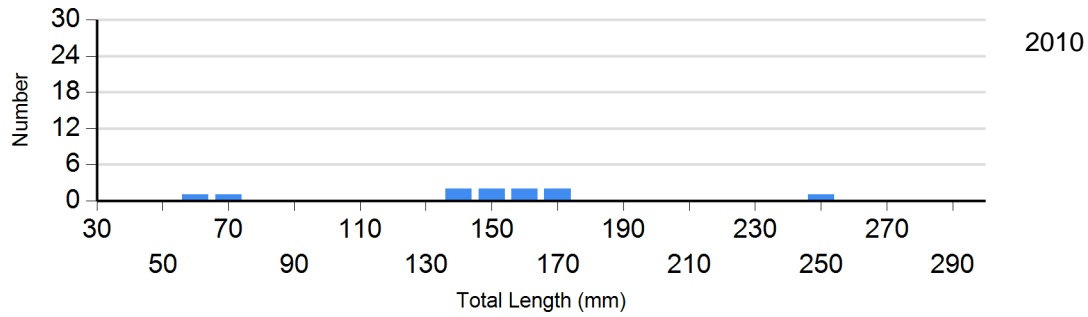
Site: 1989
Species: White Sucker

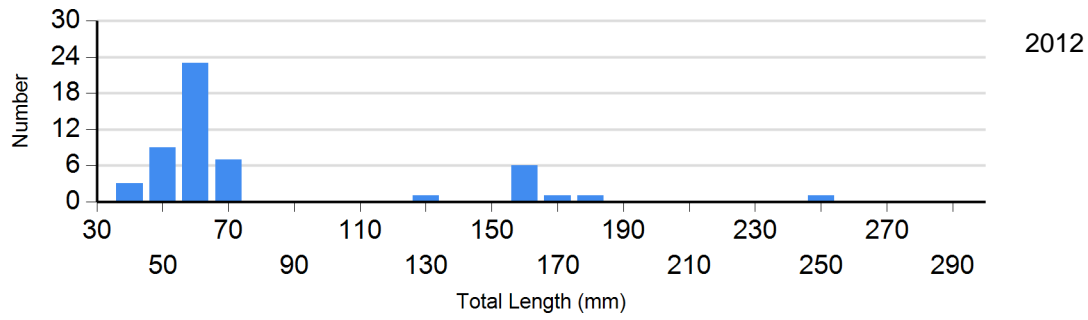


Site: 2099
Species: Brook Trout

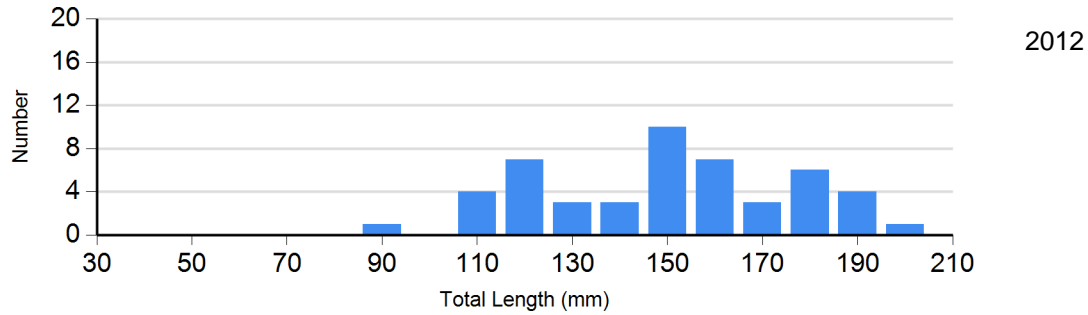
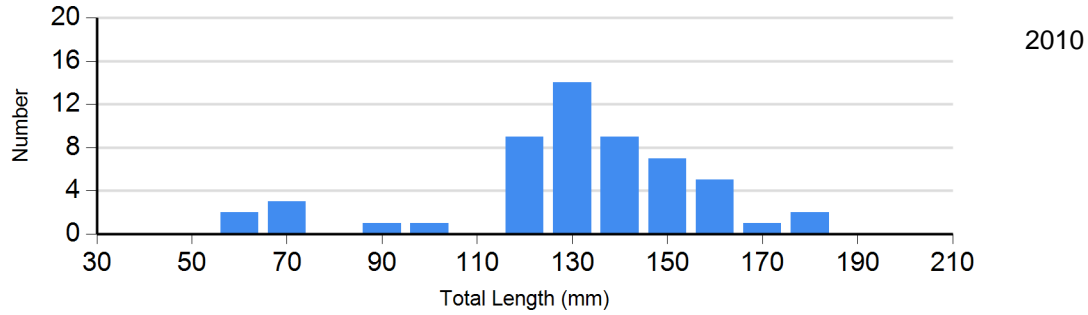


Site: 2099
Species: Brown Trout

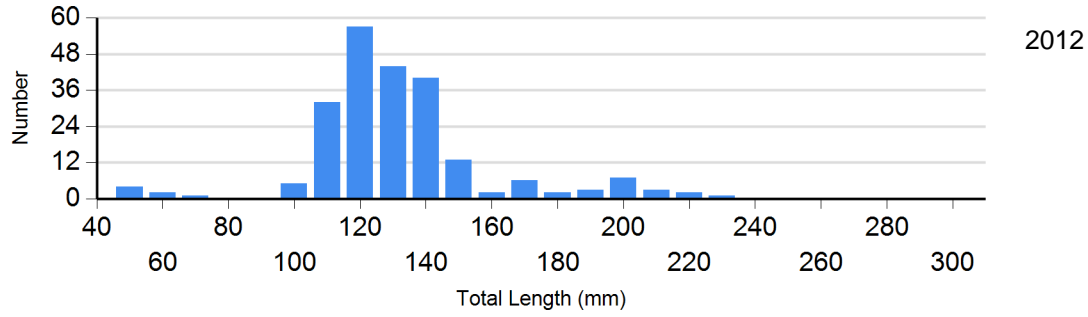
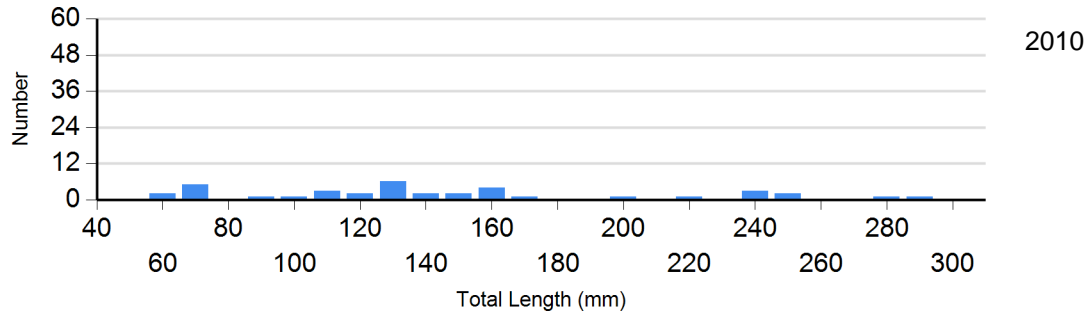




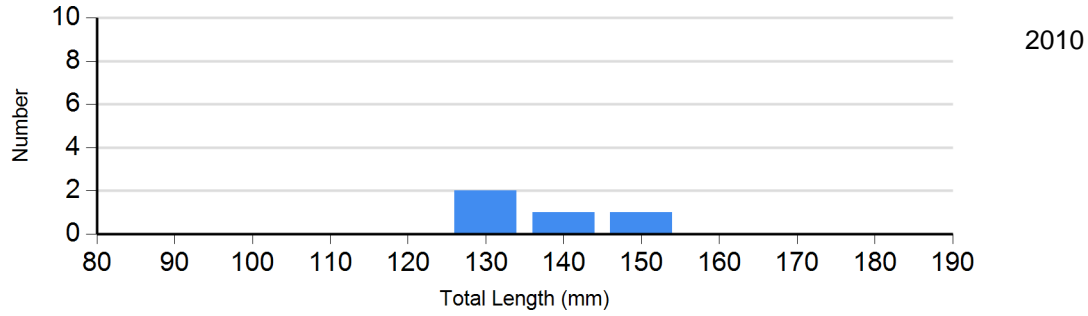
Site: 2099
Species: Mountain Sucker

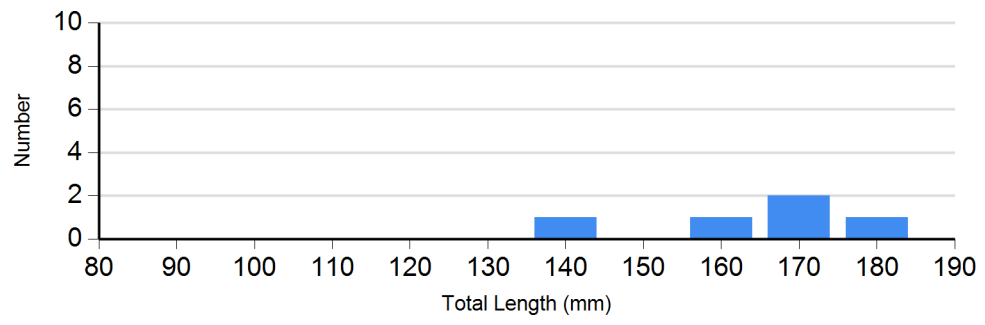


Site: 2207
Species: Brook Trout



Site: 2207
Species: Mountain Sucker





2012