

**SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY**  
**Boxelder Creek, Pennington County**  
**09-0065-00**  
**2013**

Table 1. Population and Biomass Estimates for Boxelder Creek

|  |                                 |                                     |
|--|---------------------------------|-------------------------------------|
| <b>Site Number:</b> 1983   | <b>Date Sampled:</b> 06/19/2013 | <b>Conductivity (umhos/cm):</b> 228 |
| <b>Site Midpoint (Latitude, Longitude):</b> 44.15674459, -103.46614706 | <b>Site Length (m):</b> 100     | <b>pH:</b> 8.6                      |
| <b>Survey Completed by:</b>  | <b>Mean Width (m):</b> 8.9      | <b>Water Temperature (C):</b> 18.7  |
| <b>Stream Classification:</b> BK3, BR2                                 | <b>Number of Pass:</b> 3        | <b>Voltage:</b>                     |

| 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            | 11             | 0               | 10       | 5          | 0.37         | 16         | 139.0            | 37.0                |
| Brook Trout   | >=200mm    | 1                     | 1              | 1            | 1            | 11             | 1               | 10       | 5          | 1.26         | 16         | 227.0            | 126.0               |
| Brook Trout   | All        | 2                     | 2              | 4            | 2            | 22             | 2               | 20       | 9          | 1.63         | 32         | 183.0            | 81.5                |
| Brown Trout   | <200mm     | 4                     | 4              | 4            | 4            | 45             | 3               | 40       | 18         | 2.83         | 64         | 142.8            | 70.8                |
| Brown Trout   | >=200mm    | 13                    | 13             | 14           | 13           | 146            | 28              | 130      | 59         | 24.67        | 209        | 275.2            | 189.8               |
| Brown Trout   | All        | 18                    | 18             | 19           | 18           | 202            | 33              | 180      | 82         | 29.12        | 290        | 244.0            | 161.8               |
| Longnose Dace | All        | 89                    | 170            | 293          | 89           | 1904           | 33              | 1700     | 771        | 29.47        | 2735       | 58.4             | 17.3                |
| Stone Cat     | All        | 5                     | 6              | 13           | 5            | 67             | 2               | 60       | 27         | 1.66         | 97         | 145.0            | 27.6                |
| White Sucker  | All        | 95                    | 102            | 111          | 95           | 1143           | 38              | 1020     | 463        | 34.03        | 1641       | 78.2             | 33.4                |

|  |                                 |                                     |
|--|---------------------------------|-------------------------------------|
| <b>Site Number:</b> 1989   | <b>Date Sampled:</b> 06/18/2013 | <b>Conductivity (umhos/cm):</b> 219 |
| <b>Site Midpoint (Latitude, Longitude):</b> 44.15898073, -103.47229427 | <b>Site Length (m):</b> 100     | <b>pH:</b> 8.7                      |
| <b>Survey Completed by:</b>  | <b>Mean Width (m):</b> 10.4     | <b>Water Temperature (C):</b> 22.3  |
| <b>Stream Classification:</b> BK3, BR2, RB2                            | <b>Number of Pass:</b> 1        | <b>Voltage:</b> 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     | 1                     | 1              | 1            | 1            | 10             | 0               | 10       | 4          | 0.18         | 16         | 116.0            | 21.0                |
| Brook Trout     | >=200mm    | 3                     | 3              | 3            | 3            | 29             | 3               | 30       | 12         | 3.07         | 48         | 228.7            | 118.7               |
| Brook Trout     | All        | 4                     | 4              | 4            | 4            | 39             | 4               | 40       | 16         | 3.25         | 64         | 200.5            | 94.3                |
| Brown Trout     | <200mm     | 1                     | 1              | 1            | 1            | 10             | 0               | 10       | 4          | 0.28         | 16         | 146.0            | 33.0                |
| Brown Trout     | >=200mm    | 7                     | 7              | 7            | 7            | 68             | 16              | 70       | 27         | 14.29        | 113        | 284.7            | 237.0               |
| Brown Trout     | All        | 8                     | 8              | 8            | 8            | 77             | 16              | 80       | 31         | 14.58        | 129        | 267.4            | 211.5               |
| Mountain Sucker | All        | 3                     | 3              | 3            | 3            | 29             | 1               | 30       | 12         | 0.66         | 48         | 116.3            | 25.5                |
| Rainbow Trout   | >=200mm    | 1                     | 1              | 1            | 1            | 10             | 1               | 10       | 4          | 1.33         | 16         | 253.0            | 154.0               |
| Rainbow Trout   | All        | 1                     | 1              | 1            | 1            | 10             | 1               | 10       | 4          | 1.33         | 16         | 253.0            | 154.0               |
| Stone Cat       | All        | 1                     | 1              | 1            | 1            | 10             | 0               | 10       | 4          | 0.34         | 16         | 156.0            | 39.0                |
| White Sucker    | All        | 91                    | 91             | 91           | 91           | 878            | 122             | 910      | 356        | 109.33       | 1464       | 74.7             | 139.4               |

**Site Number:** 2099  
**Site Midpoint (Latitude, Longitude):** 44.19841227, -103.53502386  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BK2, BR0

**Date Sampled:** 06/19/2013  
**Site Length (m):** 100  
**Mean Width (m):** 7.0  
**Number of Pass:** 3  
**Conductivity (umhos/cm):** 217  
**pH:** 8.0  
**Water Temperature (C):**  
**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     | 45                    | 47             | 51           | 45           | 670            | 24              | 470      | 271        | 21.05        | 756        | 135.1            | 35.2                |
| Brook Trout | >=200mm    | 5                     | 5              | 5            | 5            | 71             | 7               | 50       | 29         | 5.99         | 80         | 207.2            | 94.2                |
| Brook Trout | All        | 50                    | 52             | 56           | 50           | 741            | 31              | 520      | 300        | 27.62        | 837        | 142.3            | 41.8                |
| Brown Trout | <200mm     | 11                    | 14             | 25           | 11           | 199            | 7               | 140      | 81         | 6.25         | 225        | 143.6            | 35.1                |
| Brown Trout | All        | 11                    | 14             | 25           | 11           | 199            | 7               | 140      | 81         | 6.25         | 225        | 143.6            | 35.1                |

|                 |     |     |     |     |     |      |    |      |      |       |      |       |      |
|-----------------|-----|-----|-----|-----|-----|------|----|------|------|-------|------|-------|------|
| Longnose Dace   | All | 142 | 180 | 214 | 146 | 2565 | 27 | 1800 | 1039 | 23.66 | 2896 | 72.3  | 10.3 |
| Mountain Sucker | All | 17  | 20  | 29  | 17  | 285  | 12 | 200  | 115  | 10.88 | 322  | 113.9 | 42.8 |
| White Sucker    | All | 1   | 1   | 1   | 1   | 14   | 0  | 10   | 6    | 0.05  | 16   | 66.0  | 4.0  |

Site Number: 2207

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

Survey Completed by:

Stream Classification: BK2, BR0

Date Sampled: 06/20/2013

Site Length (m): 100

Mean Width (m): 2.8

Number of Pass: 3

Conductivity (umhos/cm): 179

pH: 7.9

Water Temperature (C): 18.0

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     | 56                    | 60             | 67           | 56           | 2109           | 80              | 600      | 854        | 71.86        | 965        | 150.5            | 38.2                |
| Brook Trout   | >=200mm    | 5                     | 5              | 6            | 5            | 176            | 17              | 50       | 71         | 15.50        | 80         | 214.2            | 98.8                |
| Brook Trout   | All        | 61                    | 65             | 72           | 61           | 2284           | 99              | 650      | 925        | 88.33        | 1046       | 155.7            | 43.3                |
| Brown Trout   | <200mm     | 3                     | 3              | 4            | 3            | 105            | 3               | 30       | 43         | 2.42         | 48         | 134.3            | 25.7                |
| Brown Trout   | All        | 3                     | 3              | 4            | 3            | 105            | 3               | 30       | 43         | 2.42         | 48         | 134.3            | 25.7                |
| Longnose Dace | All        | 132                   | 149            | 165          | 133          | 5236           | 48              | 1490     | 2121       | 42.50        | 2397       | 73.9             | 9.1                 |

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 |   |
|--|---|
| <b>Class BR1</b>                                   | Number of wild Brown Trout exceeds 150 per acre           |
| <b>Class BR2</b>                                   | Number of wild Brook Trout ranges from 25 to 150 per acre |
| <b>Class BR3</b>                                   | Number of wild Brown Trout is less than 25 per acre       |
| <b>Class BK1</b>                                   | Number of wild Brook Trout exceeds 150 per acre           |
| <b>Class BK2</b>                                   | Number of wild Brook Trout ranges from 25 to 150 per acre |
| <b>Class BK3</b>                                   | Number of wild Brook Trout is less than 25 per acre       |
| <b>Class RB1</b>                                   | Number of wild Rainbow Trout exceeds 25 per acre          |
| <b>Class RB2</b>                                   | Number of wild Rainbow Trout is less than 25 per acre     |

Table 2. Species composition and population estimates on Boxelder Creek, 2003-2013

**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      |                       |
|                     | Jun 19, 2013 | 1        | 1-5        |                       |
| Brook Trout >=200mm | Aug 25, 2010 | 7        | 7-7        | BK2                   |
|                     | Jun 20, 2012 | 5        | 5-5        | BK3                   |
|                     | Jun 19, 2013 | 1        | 1-1        | BK3                   |
| Brown Trout <200mm  | Aug 25, 2010 | 18       | 18-18      |                       |

|                     |              |     |        |     |
|---------------------|--------------|-----|--------|-----|
| Brown Trout <200mm  | Jun 20, 2012 | 31  | 30-35  |     |
|                     | Jun 19, 2013 | 4   | 4-4    |     |
| Brown Trout >=200mm | Aug 25, 2010 | 21  | 21-21  | BR2 |
|                     | Jun 20, 2012 | 16  | 16-16  | BR2 |
|                     | Jun 19, 2013 | 13  | 13-14  | BR2 |
| Creek Chub          | Jun 20, 2012 | 1   | 1-2    |     |
| Longnose Dace       | Jun 19, 2013 | 170 | 89-293 |     |
| 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  |     |
|                     | Jun 19, 2013 | 6   | 5-13   |     |
| White Sucker        | Aug 25, 2010 | 28  | 28-28  |     |
|                     | Jun 20, 2012 | 5   | 5-7    |     |
|                     | Jun 19, 2013 | 102 | 95-111 |     |

| Species/Size          | Date         | Pop Est. | (95% C.I.) | Stream Classification |
|-----------------------|--------------|----------|------------|-----------------------|
| Brook Trout <200mm    | Jun 22, 2012 | 8        | 8-9        |                       |
|                       | Jun 18, 2013 | 1        | 1-1        |                       |
| Brook Trout >=200mm   | Jun 22, 2012 | 3        | 3-3        | BK3                   |
|                       | Jun 18, 2013 | 3        | 3-3        | BK3                   |
| Brown Trout <200mm    | Jun 22, 2012 | 25       | 24-29      |                       |
|                       | Jun 18, 2013 | 1        | 1-1        |                       |
| Brown Trout >=200mm   | Jun 22, 2012 | 21       | 20-25      | BR2                   |
|                       | Jun 18, 2013 | 7        | 7-7        | BR2                   |
| Creek Chub            | Jun 22, 2012 | 2        | 2-3        |                       |
| Mountain Sucker       | Jun 22, 2012 | 40       | 9-380      |                       |
|                       | Jun 18, 2013 | 3        | 3-3        |                       |
| Rainbow Trout >=200mm | Jun 18, 2013 | 1        | 1-1        | RB2                   |
| Stone Cat             | Jun 22, 2012 | 9        | 10-15      |                       |
|                       | Jun 18, 2013 | 1        | 1-1        |                       |
| White Sucker          | Jun 22, 2012 | 143      | 125-161    |                       |

White Sucker

Jun 18, 2013

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91-91

**Site 2099**

| <b>Species/Size</b> | <b>Date</b>  | <b>Pop Est.</b> | <b>(95% C.I.)</b> | <b>Stream Classification</b> |
|---------------------|--------------|-----------------|-------------------|------------------------------|
| Brook Trout <200mm  | Jun 20, 2012 | 57              | 57-58             |                              |
|                     | Jun 19, 2013 | 47              | 45-51             |                              |
| Brook Trout >=200mm | Jun 20, 2012 | 5               | 5-5               | BK2                          |
|                     | Jun 19, 2013 | 5               | 5-5               | BK2                          |
| Brown Trout <200mm  | Jun 20, 2012 | 63              | 51-81             |                              |
|                     | Jun 19, 2013 | 14              | 11-25             |                              |
| Brown Trout >=200mm | Jun 20, 2012 | 1               | 1-2               | BR3                          |
| Longnose Dace       | Jun 19, 2013 | 180             | 146-214           |                              |
| Mountain Sucker     | Jun 20, 2012 | 78              | 49-130            |                              |
|                     | Jun 19, 2013 | 20              | 17-29             |                              |
| White Sucker        | Jun 20, 2012 | 1               | 1-5               |                              |
|                     | Jun 19, 2013 | 1               | 1-1               |                              |

**Site 2207**

| <b>Species/Size</b> | <b>Date</b>  | <b>Pop Est.</b> | <b>(95% C.I.)</b> | <b>Stream Classification</b> |
|---------------------|--------------|-----------------|-------------------|------------------------------|
| Brook Trout <200mm  | Aug 25, 2010 | 29              | 29-29             |                              |
|                     | Jun 15, 2012 | 244             | 219-269           |                              |
|                     | Jun 20, 2013 | 60              | 56-67             |                              |
| Brook Trout >=200mm | Aug 25, 2010 | 9               | 9-9               | BK2                          |
|                     | Jun 15, 2012 | 16              | 13-26             | BK1                          |
|                     | Jun 20, 2013 | 5               | 5-6               | BK2                          |
| Brown Trout <200mm  | Jun 20, 2013 | 3               | 3-4               |                              |
| Longnose Dace       | Jun 20, 2013 | 149             | 133-165           |                              |
| Mountain Sucker     | Aug 25, 2010 | 4               | 4-4               |                              |
|                     | Jun 15, 2012 | 6               | 5-13              |                              |
| White Sucker        | Aug 25, 2010 | 1               | 1-1               |                              |

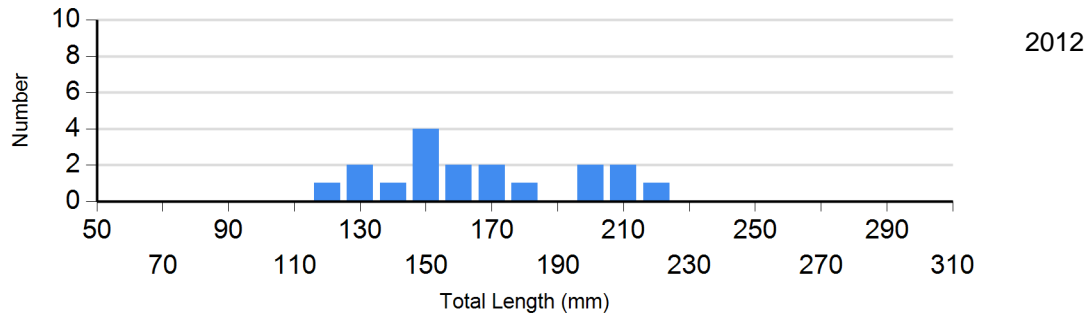
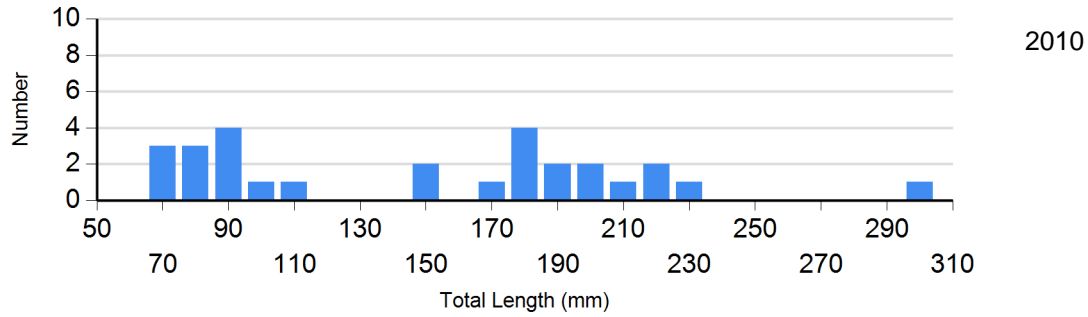


## Length Frequency Distribution

Length frequency histogram of species sampled by year.

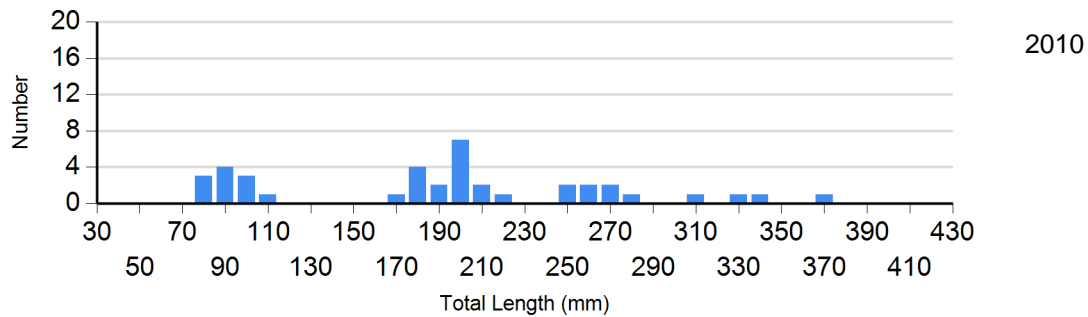
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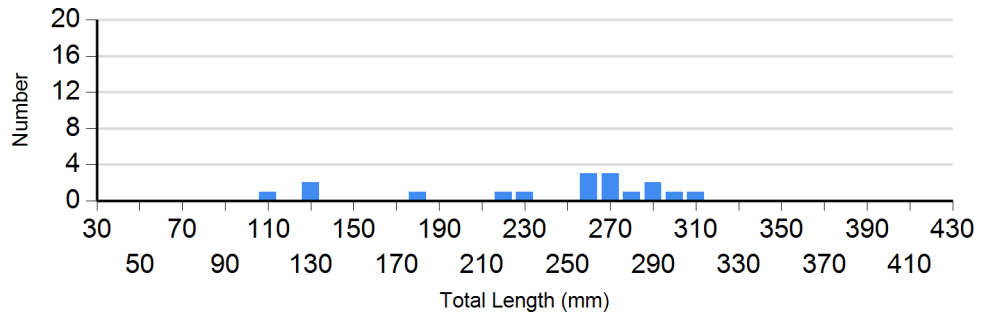
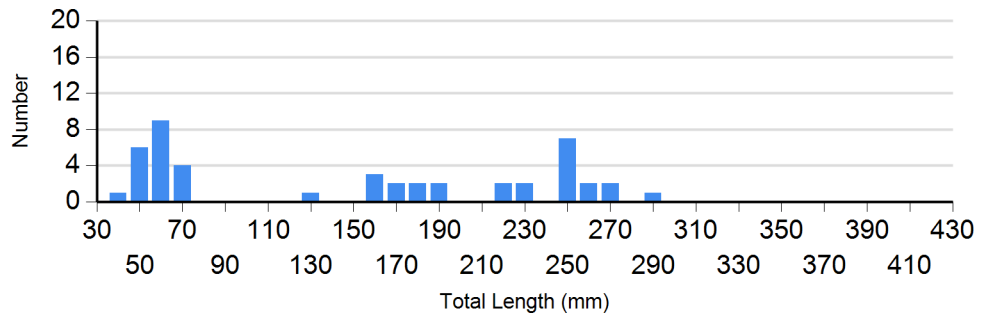
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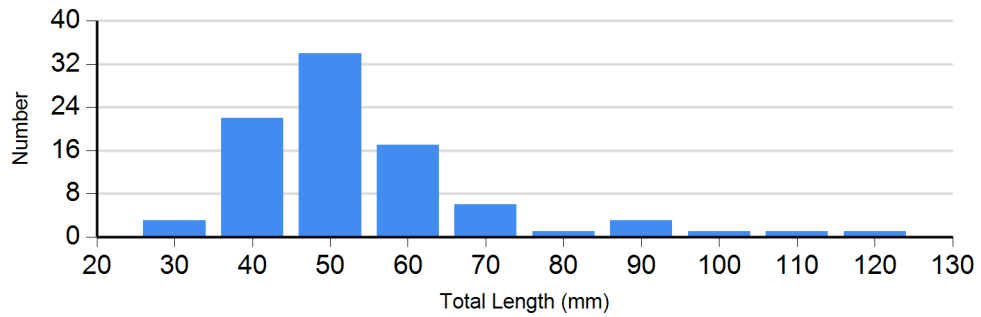
**Site:** 1983

**Species:** Brown Trout

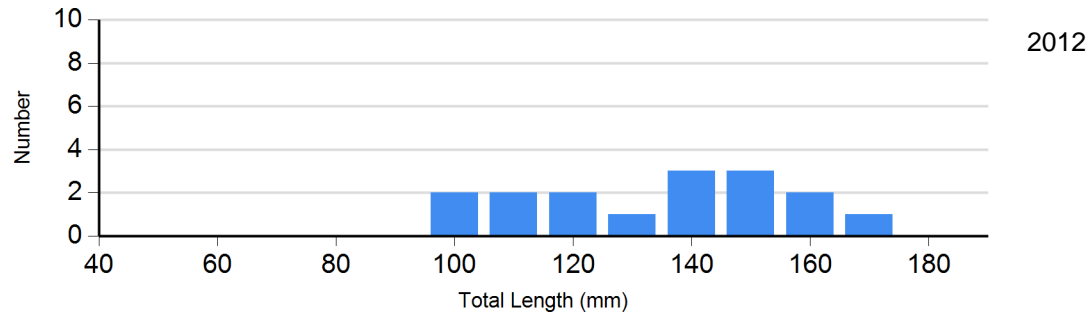
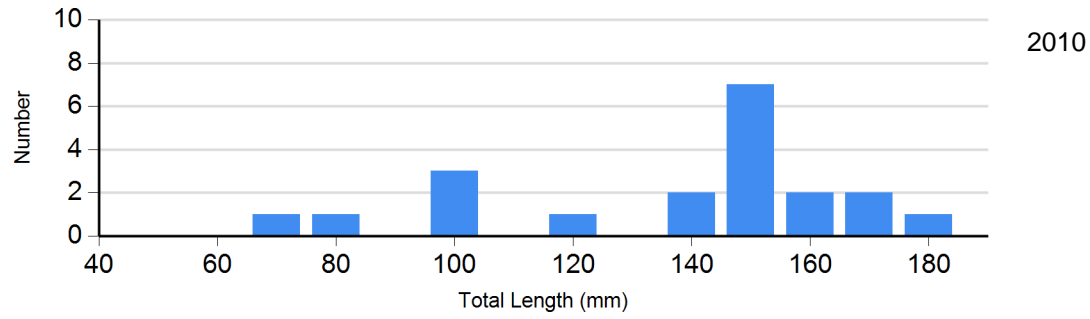




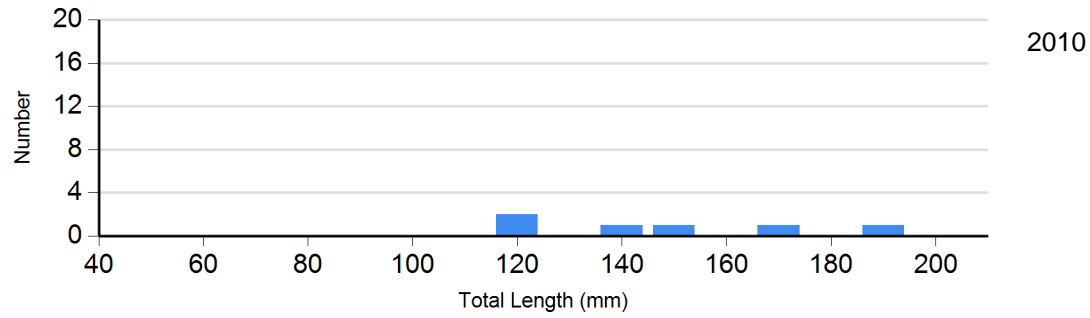
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**Species:** Longnose Dace

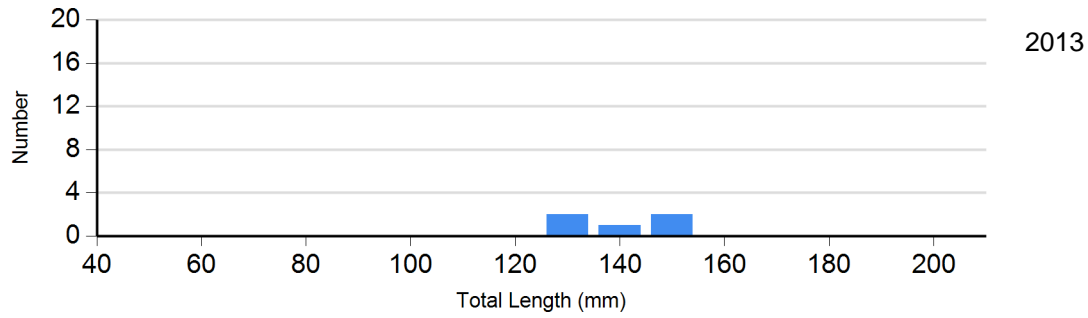
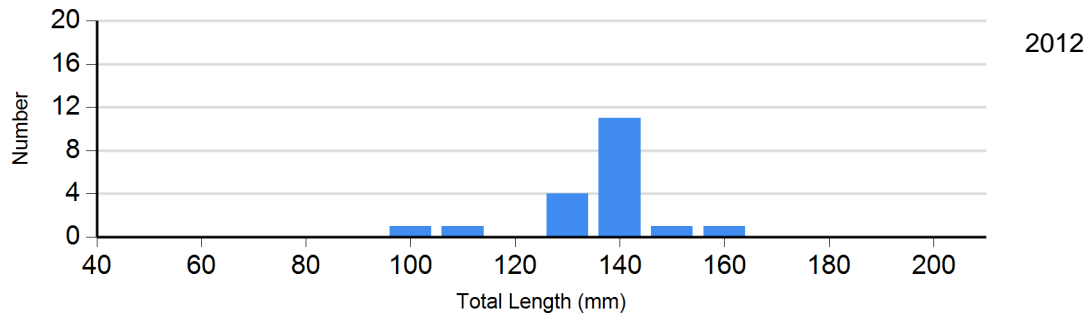


**Site:** 1983  
**Species:** Mountain Sucker

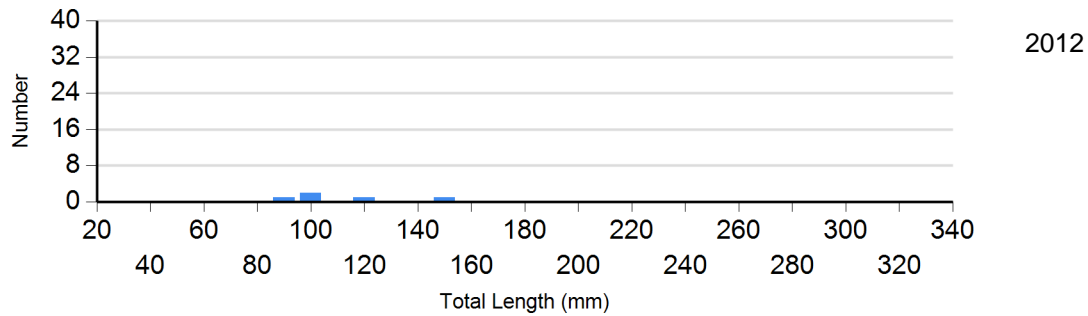
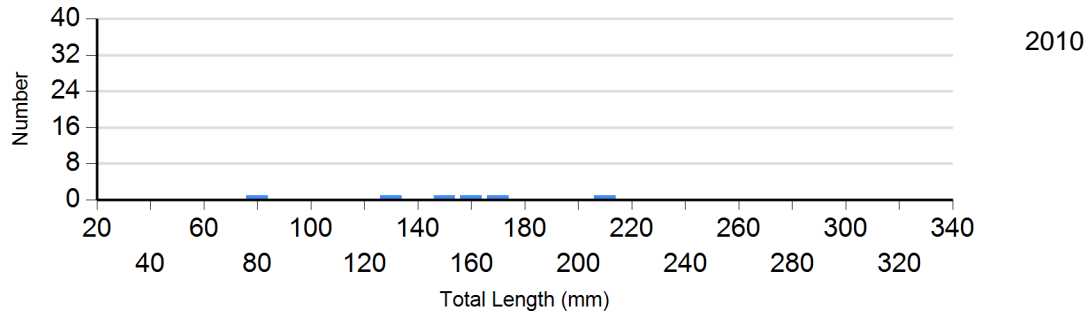


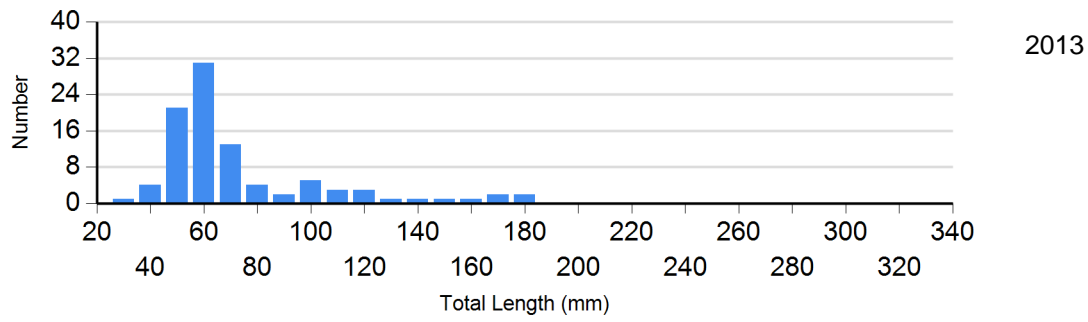
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**Species:** Stone Cat



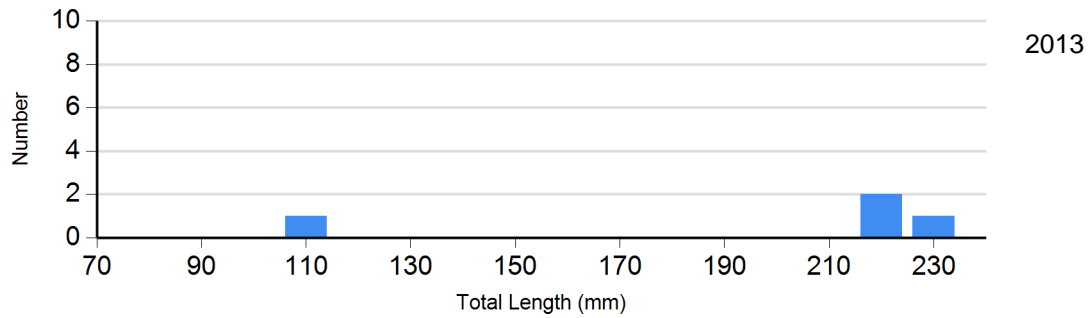
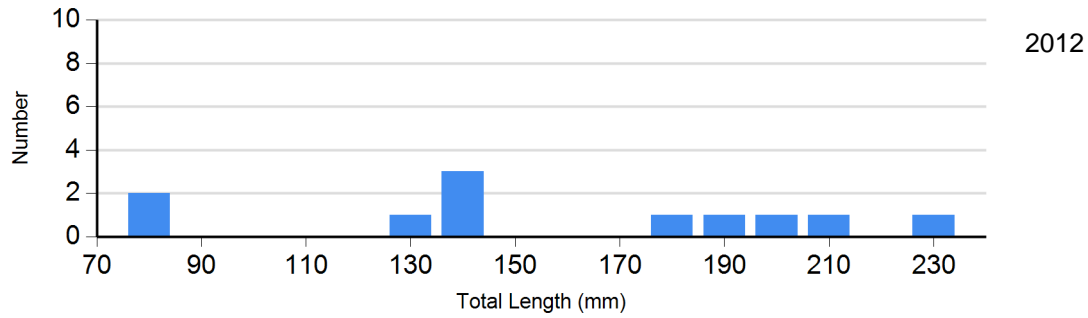


**Site:** 1983  
**Species:** White Sucker

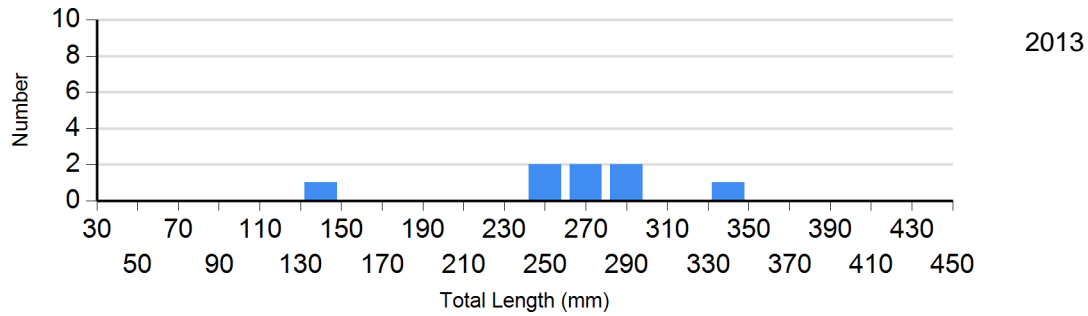
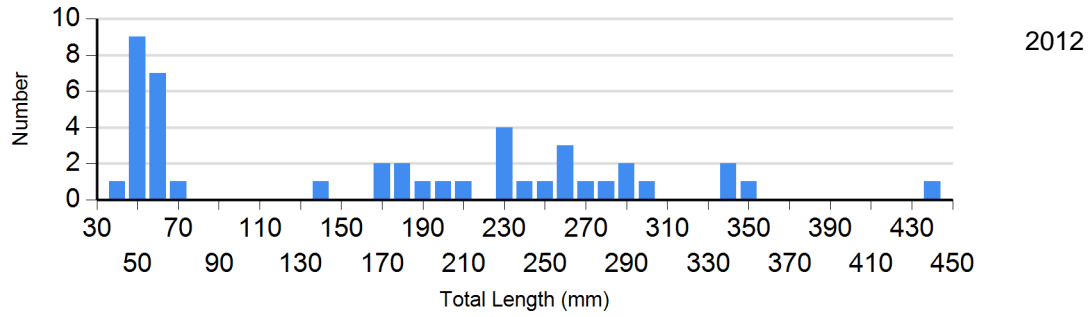




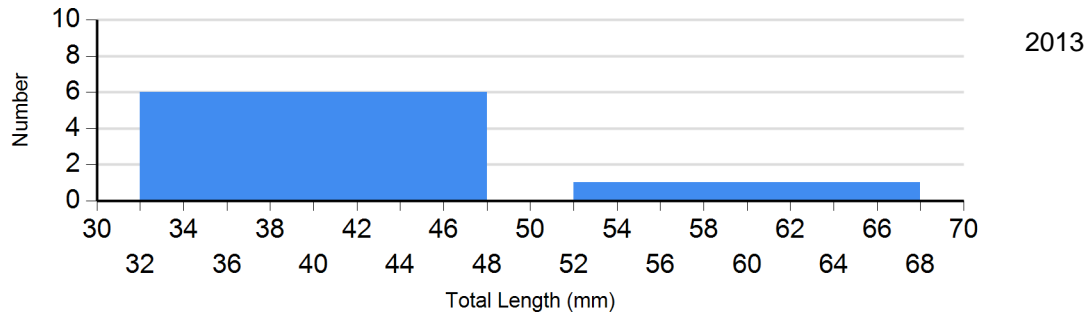
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Species: Brook Trout



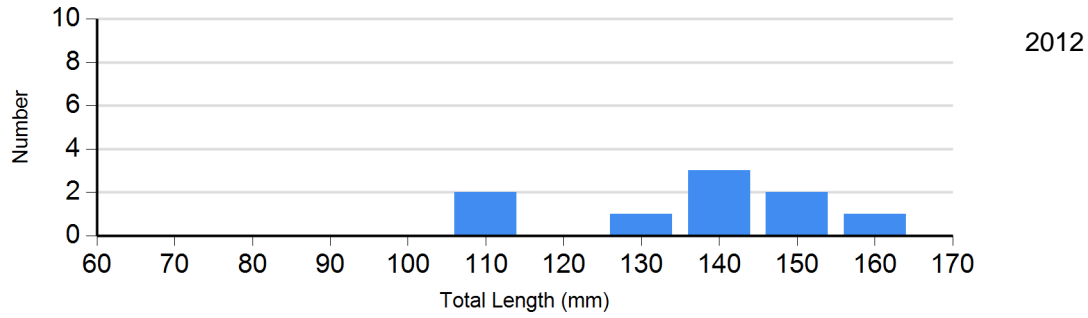
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**Species:** Brown Trout



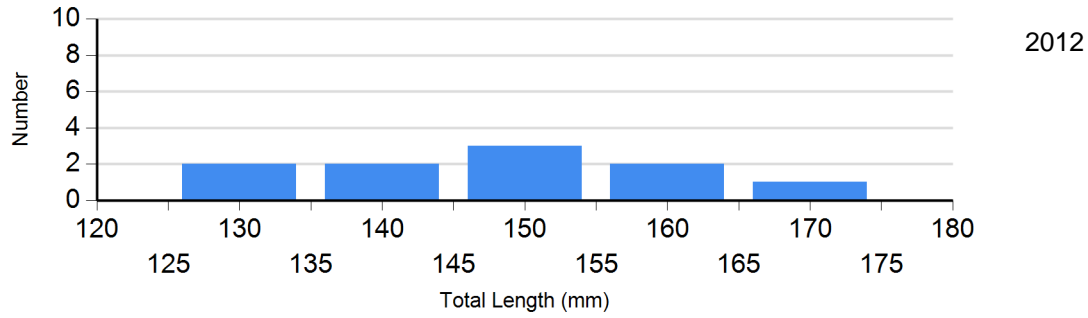
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**Species:** Longnose Dace



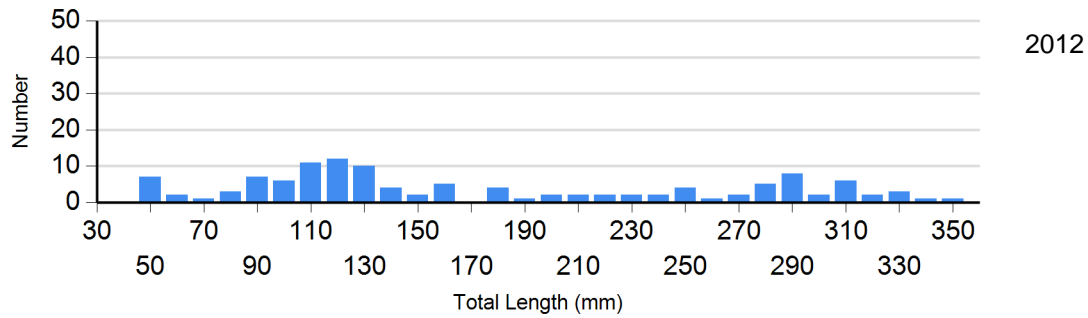
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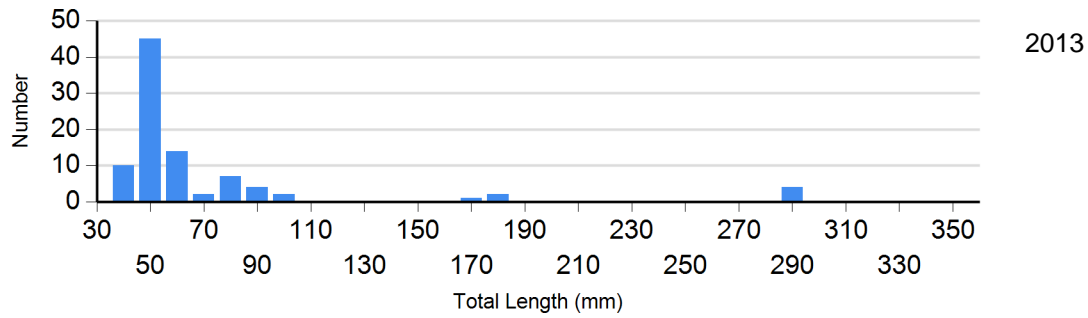


**Site:** 1989  
**Species:** Stone Cat

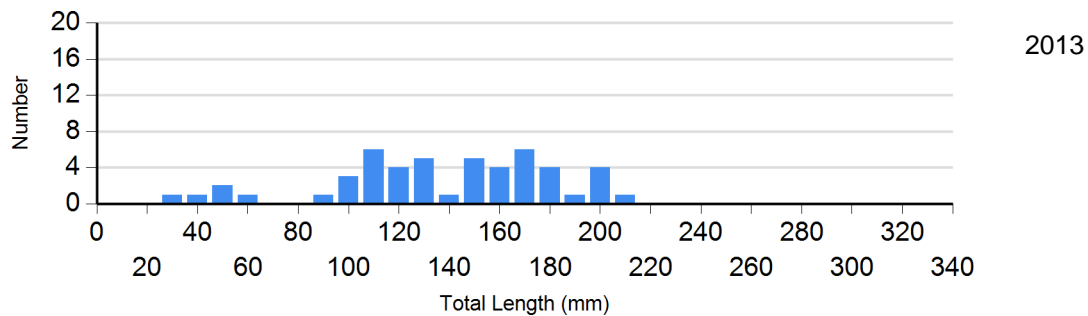
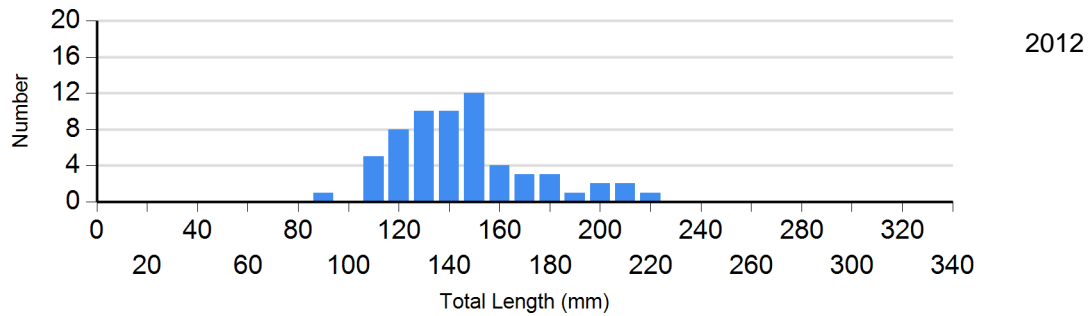
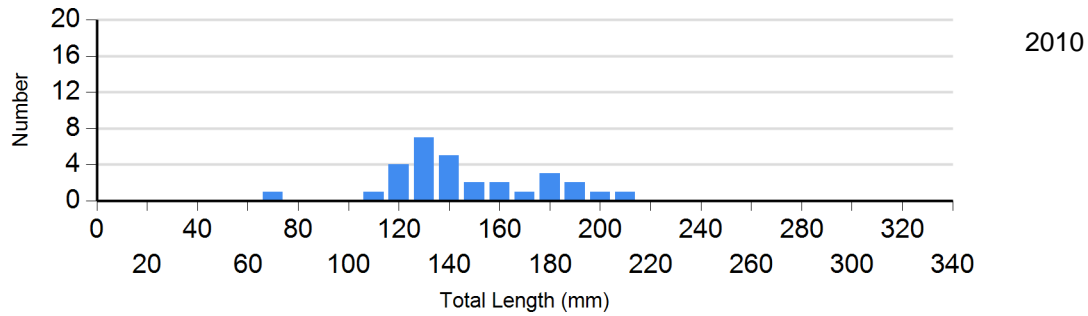


**Site:** 1989  
**Species:** White Sucker



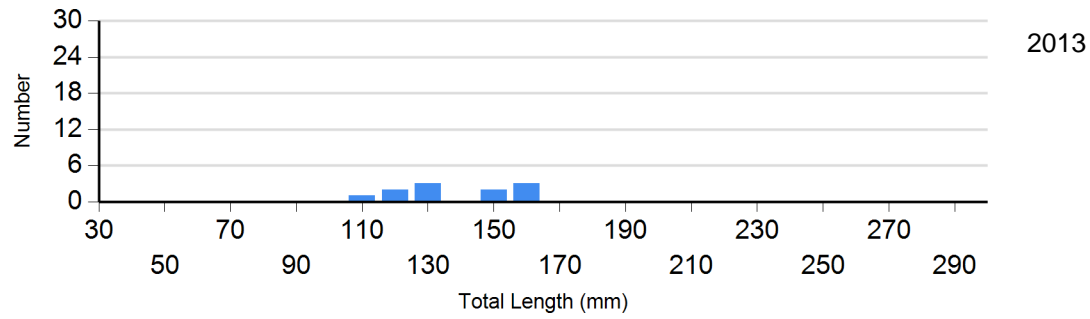
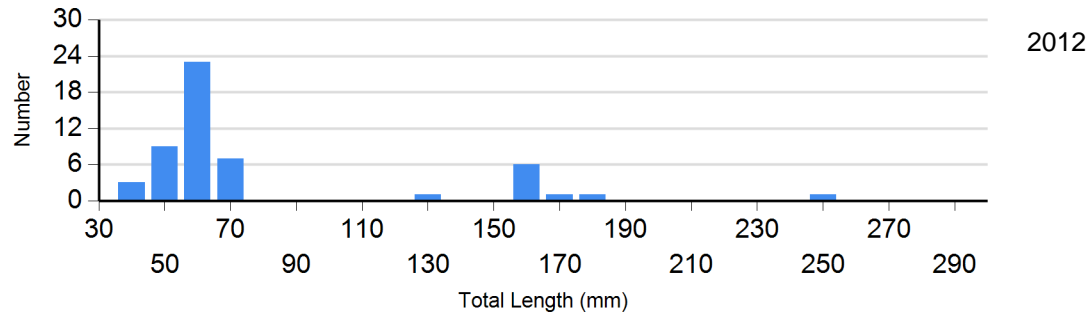
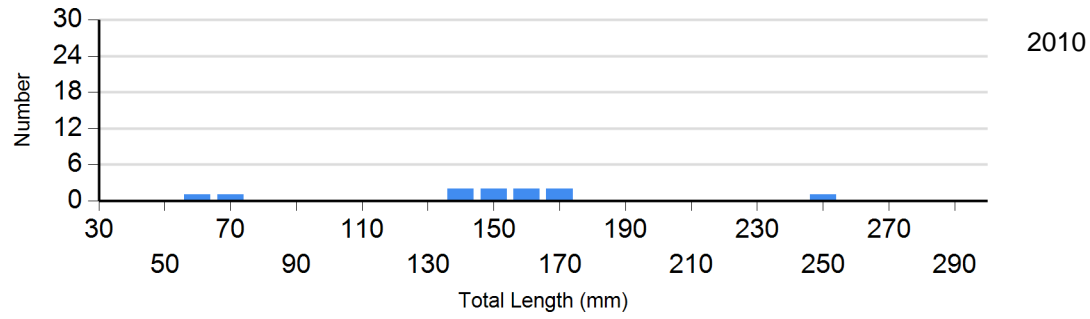


Site: 2099  
Species: Brook Trout

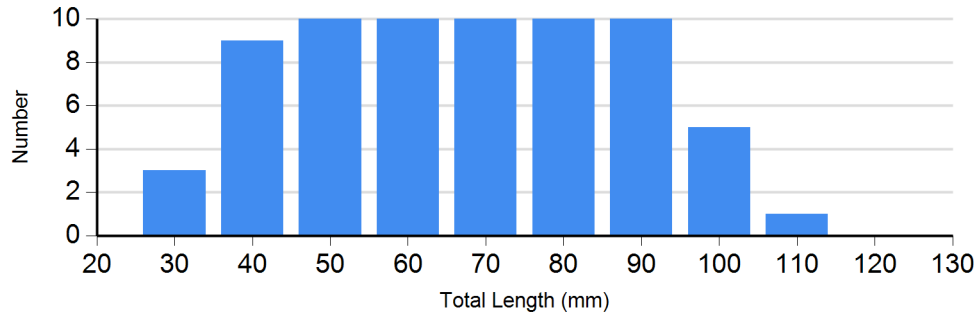




Site: 2099  
Species: Brown Trout

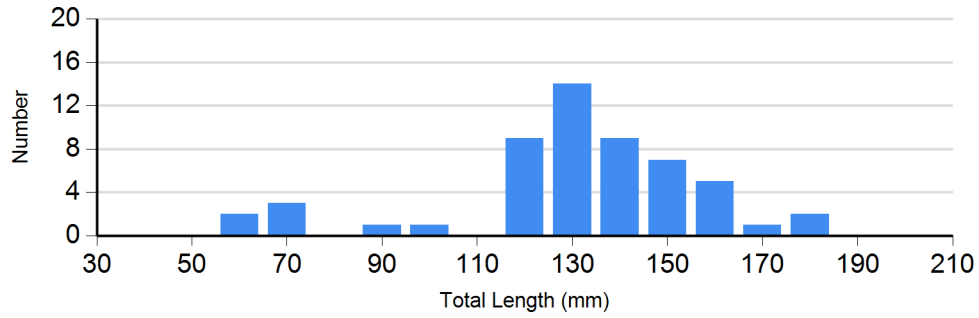


**Site:** 2099  
**Species:** Longnose Dace

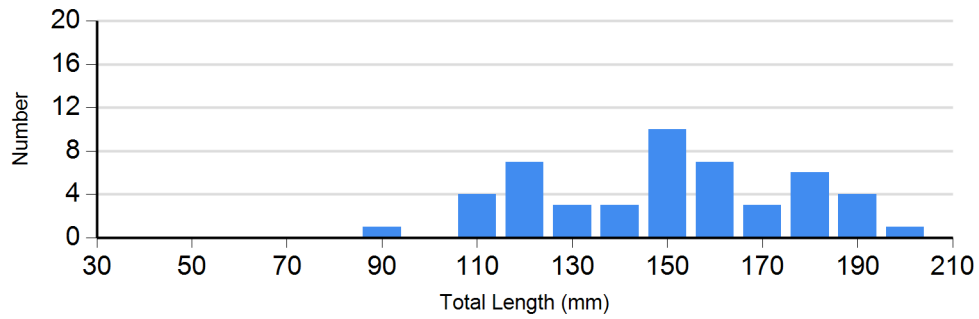


2013

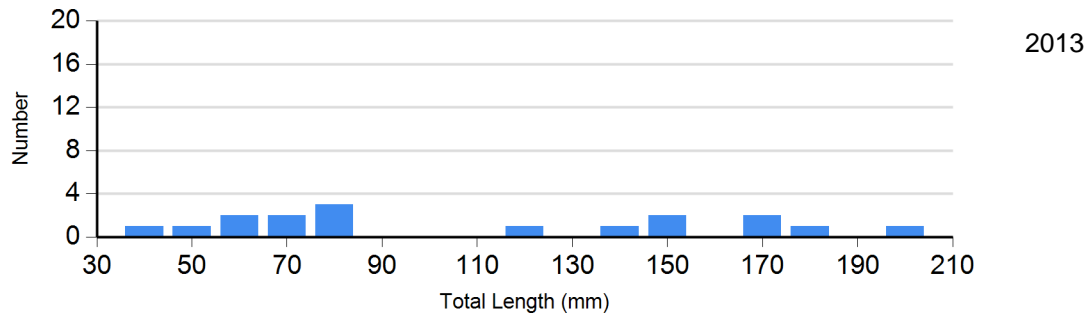
**Site:** 2099  
**Species:** Mountain Sucker



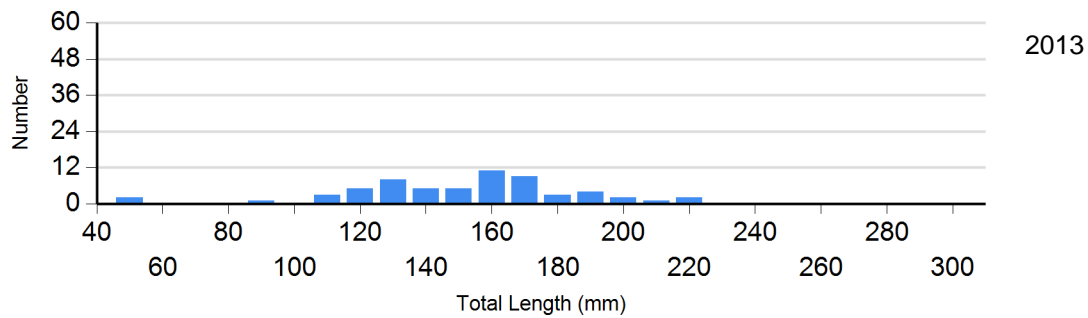
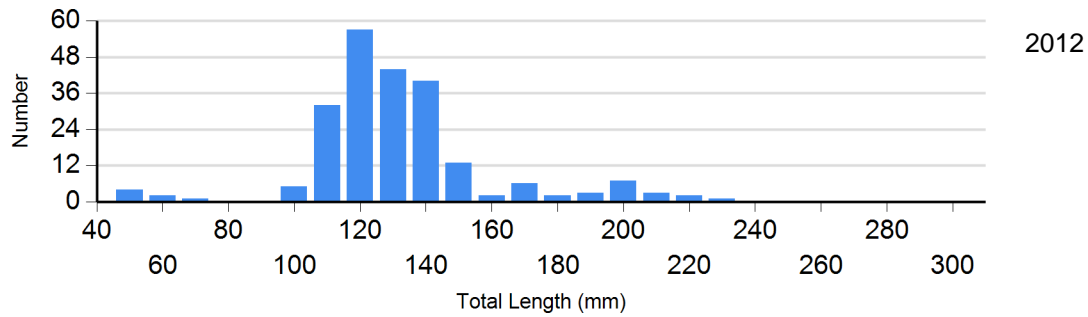
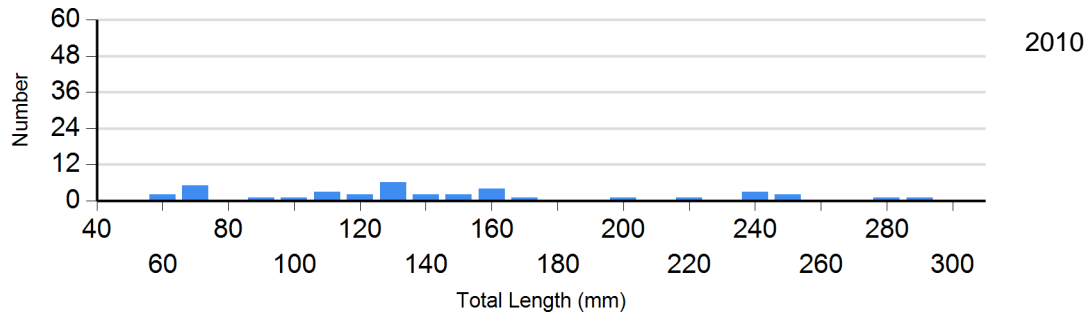
2010



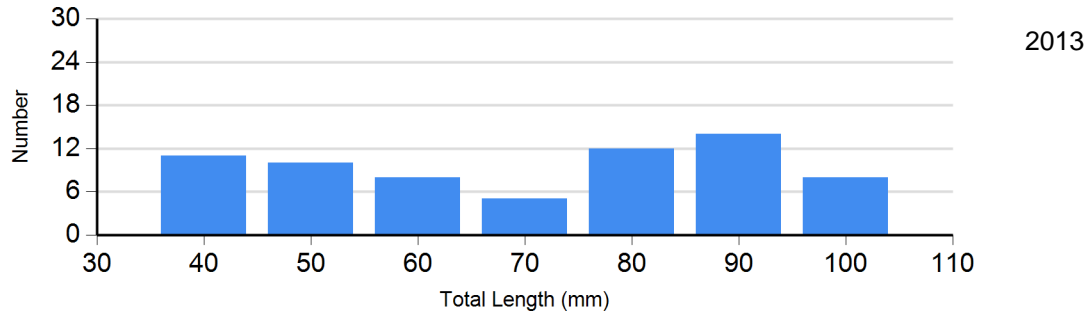
2012



Site: 2207  
Species: Brook Trout



**Site:** 2207  
**Species:** Longnose Dace



**Site:** 2207  
**Species:** Mountain Sucker

