D-44

# Fish Of the Black Canyon Of the Gunnison National Monument

Seasonal Ranger
James S. Day

1975

Financed by

Black Canyon National Monument, National Park Service

Montrose Game and Fish Department

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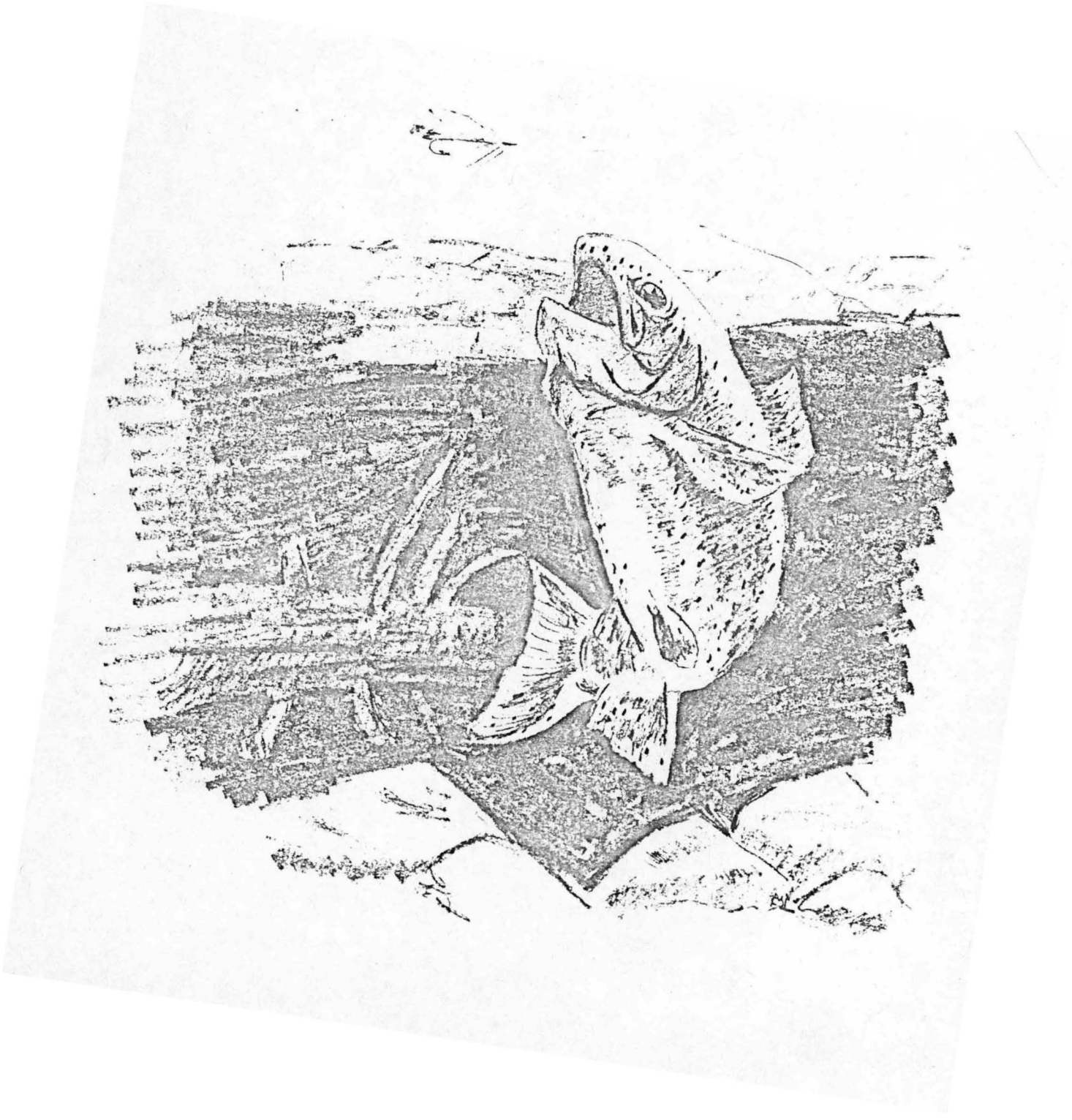
National Park Service
Black Canyon National Monument



ACKNOWLEDGEMENTS

I would like to thank Black Canyon National Monument and the Montrose Game and Fish Department for the help on this study. I would also like to thank Bill Rottinghaus for the sculpin specimen and Louise Bacon for the typing and other assistance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

# LIST OF APPENDICES

ABSTRACT: Fish of Black Canyon National Monument was a study to determine facts on the fish populations on the Gunnison River inside Black Canyon National Monument. Rainbow trout marked with fluorescent pigments at Blue Mesa Dam upstream were not found inside the Monument indicating a poor survival rate through the turbines for any fish moving downstream. Two new species were found not recorded by Vincent and Kinnear study of 1966. The brown trout to rainbow trout ratio has decreased over the last few years. Information was collected by checking fishermen and setting a gill net on different points along River.

## INTRODUCTION

The study area consisted of four points on the Gunnison River within Black Canyon Monument, which is located 14 miles East from Montrose, Colorado via Highway 50 and Colorado 347. Access to the north rim can be made from Colorado 92 at Crawford Dam outside of Crawford, Colorado. The narrow gorge through the Black Canyon cut by the Gunnison River offers excellent fishing for the arduous backpacker. From rim to river the elevation falls on an average of 2,000 feet, making any descent difficult, but fishing is a prime objective to many visitors coming to the Monument. I have included some information on the rainbow trout (Salmo gairdneri) because of this.

The purpose behind this study was to determine three things:

1. Were any rainbow trout living after coming through the dams upstream from the Monument? The dams are Blue Mesa near Gunnison, Colorado and Morrow Point Dam at Cimarron, both on Highway 50 east of Montrose, and the current construction of Crystal Dam which is two miles upstream from the Monument boundary. Any fish stocked at Blue Mesa Lake over the last five years have been marked by blasting different fluorescent pigments into the stockers before releasing them. Each year-class was marked by different color pigment;

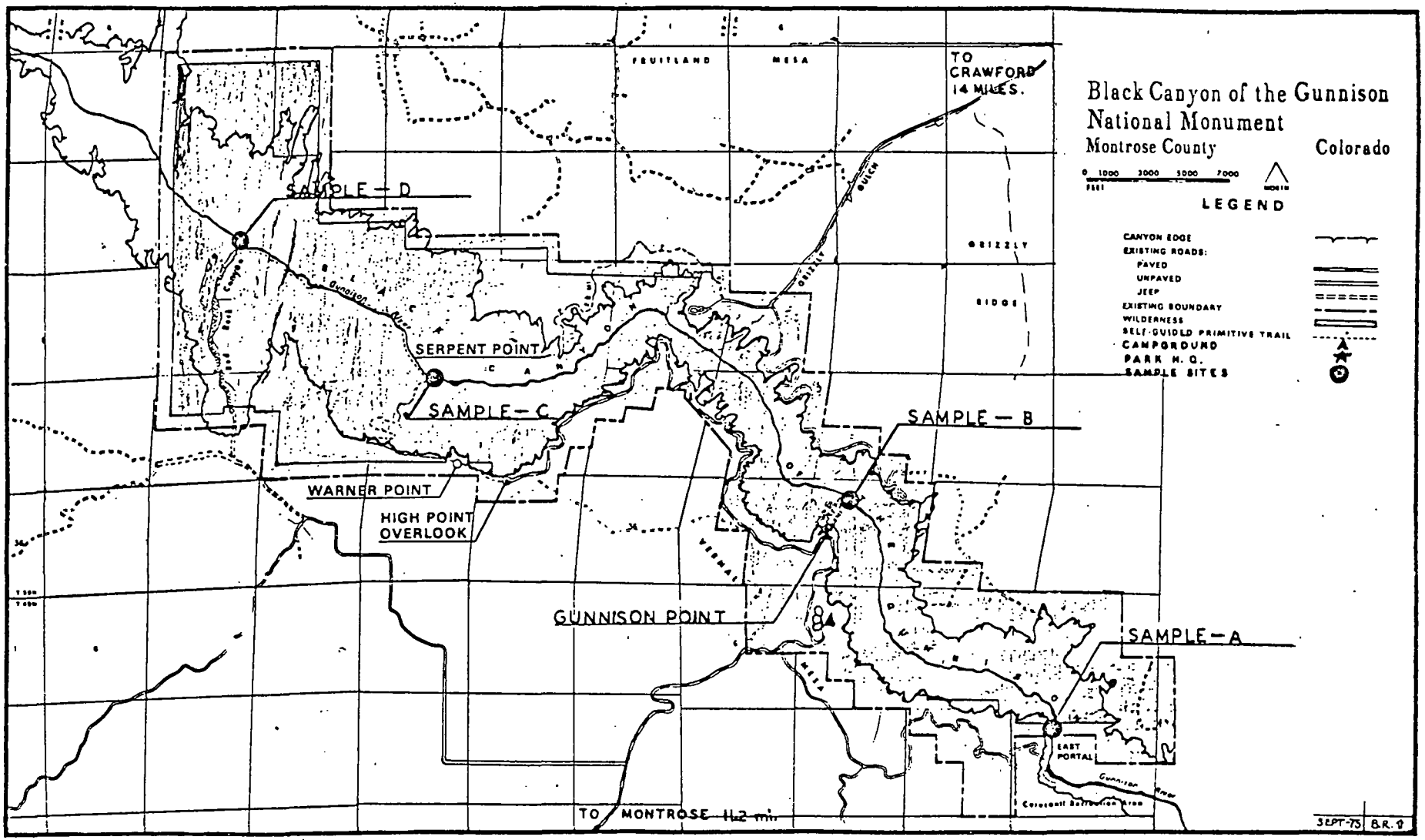

Black Canyon of the Gunnison
National Monument
Montrose County
Colorado
LEGEND
CANYON EDGE
EXISTING ROADS:
PAVED
UNPAVED
JEEP
EXISTING BOUNDARY
WILDERNESS
SELF-GUIDED PRIMITIVE TRAIL
CAMPGROUND
PARK H. Q.
SAMPLE SITES
TO CRAWFORD 14 MILES.
FRUITLAND MESA
SAMPLE — D
SERPENT POINT
SAMPLE — C
SAMPLE — B
WARNER POINT
HIGH POINT OVERLOOK
GUNNISON POINT
SAMPLE — A
EAST PORTAL
TO MONTROSE 11.2 mi.
SEPT-75 B.R.9

Figure 1.

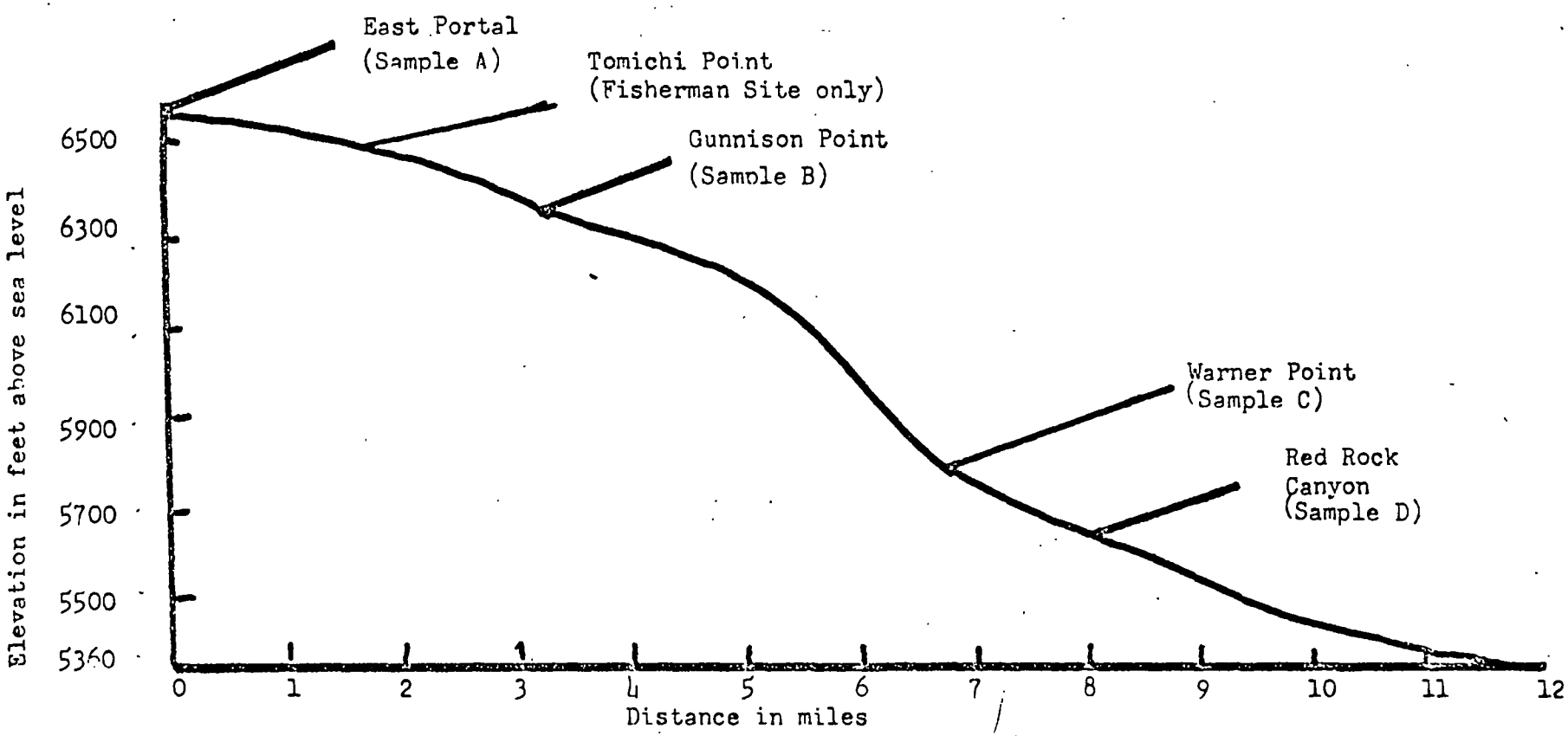



Figure 2. Elevation drop of the Gunnison River through Black Canyon National Monument.

1970-yellow, 1971-green, 1972 and 1973 unmarked, 1974-yellow for those released in June, and yellow-blue for those released in August. All of the 1975 release were marked with red pigment. This was an excellent year to check for pigments. Because of a large anticipated runoff of wet snow, the dams were drained to a low level washing many fish downstream.

2. The second objective of the study was to see if any new fish species could be recorded since Vincent and Kinnear's study of 1966 which took place just after the completion of Blue Mesa Dam.

3. The third phase of the study was to get some idea as to the natural population of brown trout (Salmo trutta) which still survive inside the Black Canyon. Have the percent of brown trout to other trout increased in the last ten years due to the different water conditions created by the dams?

METHODS AND EQUIPMENT

After reading Fish and Fish Habitats in Black Canyon National Monument by Kinnear and Vincent (1966) and talking to Bill Wiltzius, Montrose Game and Fish, I decided the best method of collecting information would be to check fishermen and to use a gill net. Electro fishing equipment or seines would be too expensive and would be too heavy to get into the canyon because of limited help that could be obtained. Every-

thing used had to be backpacked into the canyon. A gill net 125 feet long, six feet deep, composed of five different mesh sizes was selected. The mesh sizes varied from 3/4 inch square to 1 1/2 inch square. The net was built with buoys on top to keep the net stretched tight and a lead-weighted line on the bottom of the net to sink it to the bottom. The net was set a total of six times from July 10 to September 7 at four different places inside the canyon (Figures 1 & 2).

The net was set overnight in quiet water, preferably across eddies to catch fish which would not be feeding and not be in fast water. This posed a problem because two men were needed to set the net and often the river would be too fast to cross or a pool could not be found. Water fluctuations of 4 to 5 times normal flow, bringing down deadwood and debris had to be considered. These water fluctuations were due to the emerging of water through turbines for electrical power. The net was set at the East Portal twice, at Gunnison Point once, at Warner Point twice, and at Red Rock Canyon once (Figure 1). These points were chosen because the middle part of the canyon seems to be a natural barrier, so sets had to be made on each end of the Monument for a better idea of the fish species present. The middle part of the river was a fast flowing stretch full of gigantic

boulders, whitewater, and falls up to forty feet high (Torrence Falls).

Size, weight, and scale samples were taken on all game fish observed, both those caught by fishermen and those taken in the net. A fill-out sheet was printed up to give out to fishermen, but it was found that no useful information could be obtained, and it was disregarded after the first few times of use. Length of each fish was measured from the tip of the nose to the end of the tail fin when pinched together. Scale samples were taken on the rainbow trout, brown trout, and northern pike (Esox lucius) for age identification. As this study was not primarily concerned with rainbow trout, the rainbow trout scales were not used to determine aging but were turned over to the Montrose Game and Fish Department. Each scale sample was taken from either side of the dorsal fin. A one-pound Hansen Scale, Model 1411 was used for weighing purposes. All weights were taken in grams. The larger fish had to be cut into segments and the segments added together to obtain total live weight. All equipment used was from the Montrose Game and Fish Department and the Black Canyon National Park Service. Water flow was obtained from a gauging station above the Monument at East Portal (Bureau of Reclamation) as were water temperatures (Figure 4).

DATA

A total of 193 fish were checked during the months of June, July, August, and September (Table 1). These were:

| | |
|---|---|
| rainbow trout | (Salmo gairdneri) |
| brown trout | (Salmo trutta) |
| western white sucker | (Catostomus commersoni) |
| longnose sucker | (Catostomus catostomus) |
| flannelmouth sucker | (Catostomus latipinnis) |
| eagle sculpin | (Cottus annae) |
| northern pike | (Esox lucius) |

Each rainbow trout observed was checked with a black light for pigments. Usually a box or a blanket was used for a dark area. None of the rainbow trout were found to have any color markings. Apparently no fish lived coming through the turbines of the dams upstream from the Monument. Two different types of fish were caught that were not recorded in Black Canyon before; the northern pike (Esox lucius) and an eagle sculpin (Cottus annae). The northern pike (Sigler and Miller 1963) was caught by gill net at Red Rock Canyon and the eagle sculpin (Wiltzius 1975) by a fisherman at Warner Point using bait on July 20. The bluehead sucker, bonytail chub, and speckled dace were not seen during the study, but were thought to be still in the lower stretches of the river and would have been taken if more of a sample could have been taken.

The study collected 23 brown trout and 136 rainbow trout for a total of 159 trout species. Ninety

TABLE 1. Number and distribution of fish checked during study

| Species | East Portal | Tomichi | Gunnison Point | Warner Point | Red Rock Canyon | Total |
|---|---|---|---|---|---|---|
| Rainbow trout | 63 | 7 | 30 | 23 | 13 | 136 |
| Brown trout | 7 | 2 | 5 | 5 | 4 | 23 |
| Western white sucker | 6 | - | - | 6 | - | 12 |
| Longnose sucker | 18 | - | - | - | - | 18 |
| Flannelmouth sucker | - | - | - | 1 | 1 | 2 |
| Eagle sculpin | - | - | - | 1 | - | 1 |
| Northern pike | - | - | - | - | 1 | 1 |

TABLE 2. Table of average lengths, weights, and range difference

| | | Rainbow trout | | Brown trout | | Western White sucker | |
|---|---|---|---|---|---|---|---|
| | | lgth | wt | lgth | wt | lgth | wt |
| East Portal | avg. | 11.6 | 317g | 10 | 116g | 13.2 | 541g |
| | range | 7-17" | 61-815g | 8-13" | 75-320g | 10-15.3" | 214-714g |
| Tomichi Point | | 11.5 | * | * | * | * | * |
| | | 10.2-13.8" | * | * | * | * | * |
| Gunnison Point | | 13.7 | 420g | 11.7 | * | * | * |
| | | 9.2-17.8" | 126-830g | 9.2-13" | 126-372g | * | * |
| Warner Point | | 13.2 | 388 | 12.4 | 305g | 14.8 | 608g |
| | | 7.8-18.1" | 89-777g | 9.4-16.3" | 130-610g | 13.7-16 | 448-790g |
| Red Rock Canyon | | 15.4 | 521g | 13.3 | 270g | * | * |
| | | 10.7-18" | 209-765g | 10.7-16" | 209-570g | * | * |
| Total Avg. | | 12.9" | 411g | 11.3" | 230g | 14" | 574g |

| | | Longnose sucker | | Flannelmouth sucker | | Northern pike | | Eagle sculpin | |
|---|---|---|---|---|---|---|---|---|---|
| | | lgth. | wt | lgth. | wt. | lgth. | wt | lgth. | wt |
| East Portal | avg. | 10.4" | 194g | * | * | * | * | * | * |
| | range | 8-11.5" | 88-295g | * | * | * | * | * | * |
| Tomichi Point | | * | * | * | * | * | * | * | * |
| | | * | * | * | * | * | * | * | * |
| Gunnison Point | | * | * | * | * | * | * | * | * |
| | | * | * | * | * | * | * | * | * |
| Warner Point | | * | * | 13.4" | 383g | * | * | 4" | * |
| | | * | * | * | * | * | * | * | * |
| Red Rock Canyon | | * | * | 16.8" | 830g | 27.5" | * | * | * |
| | | * | * | * | * | * | * | * | * |
| Total Avg | | 10.4" | 194g | 15.1" | 606g | 27.5" | * | 4" | * |

* - not enough data for accuracy

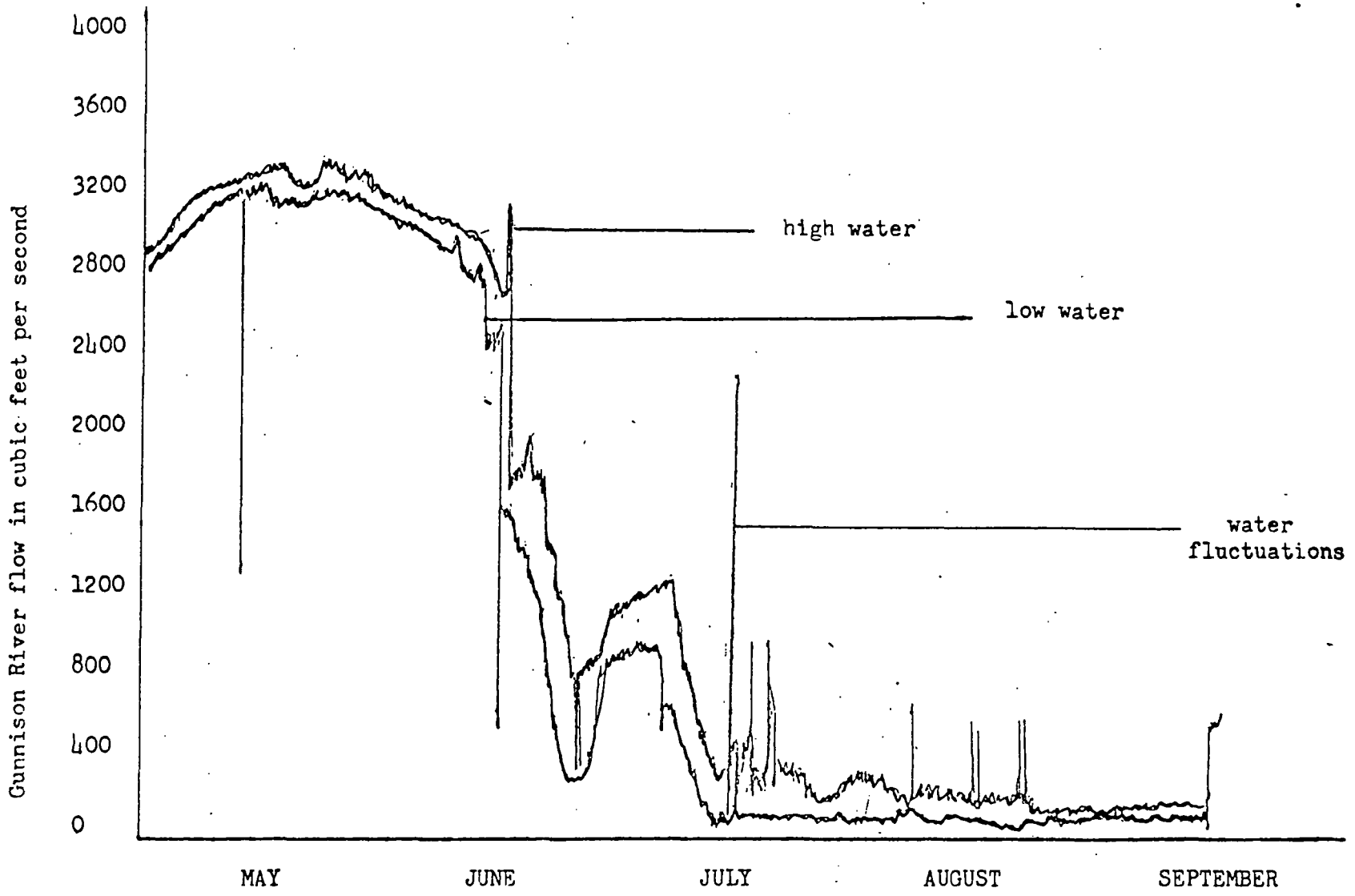



Figure 3. Volume of water passing through Black Canyon National Monument during study period.

(see appendix)

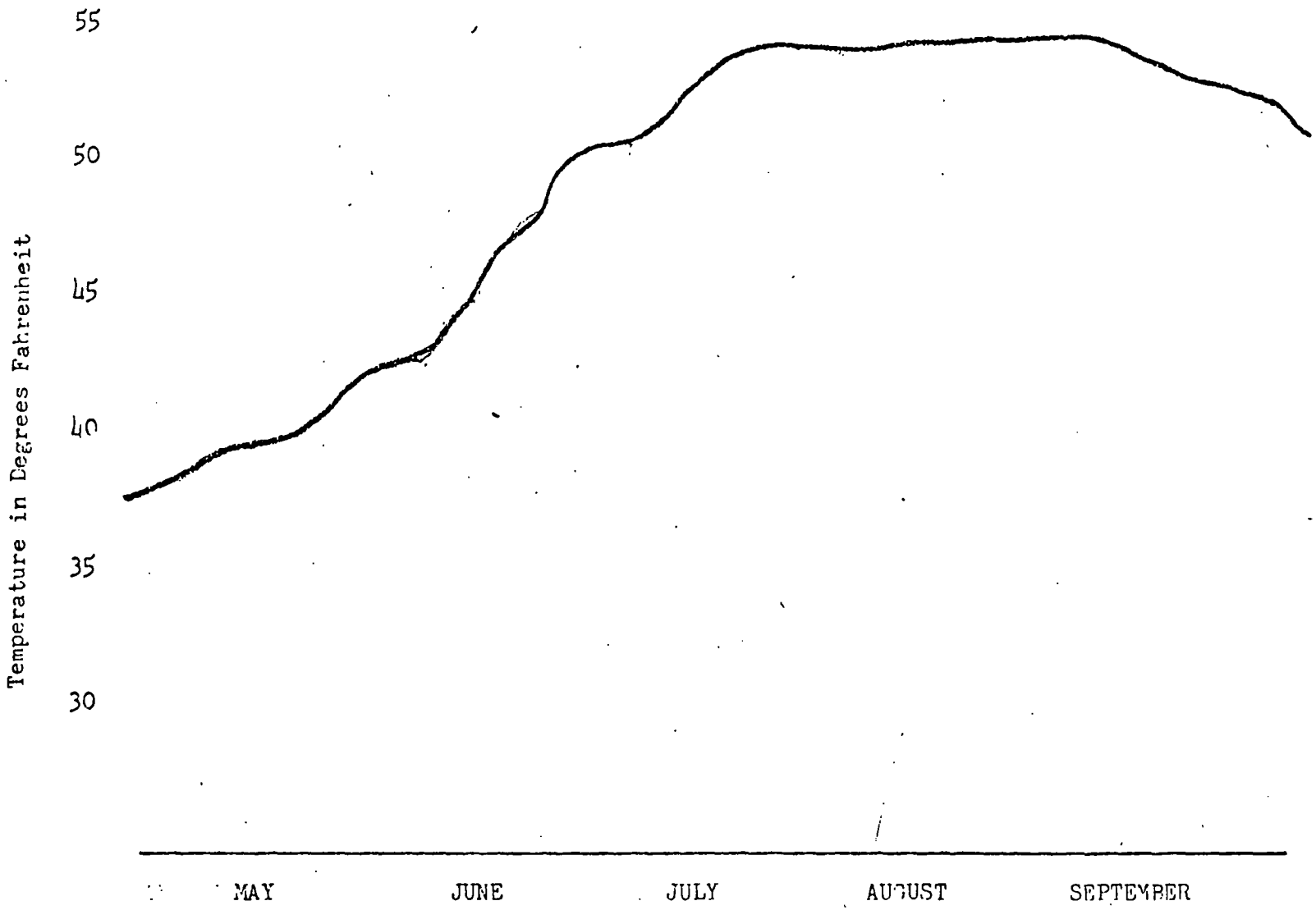



Figure 4. Water temperatures of the Gunnison River at East Portal gauging station.

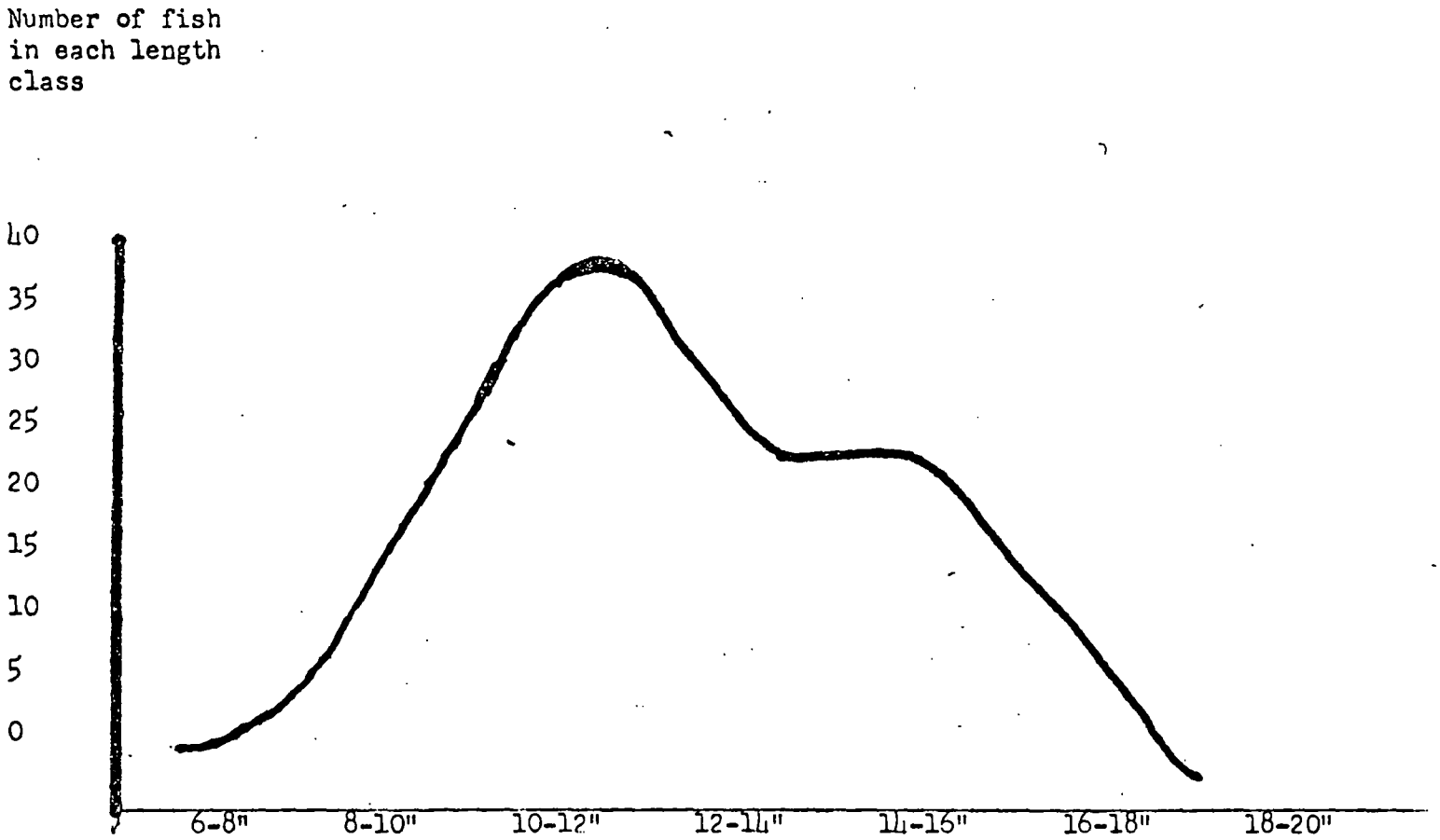



Figure 5. Population curve on rainbow trout.

Table 3. Brown trout statistics.

| | Length in inches | Weight in grams | Age in years |
|---|---|---|---|
| East Portal | 10.3 | 145 g | 3+ |
| | 8.4 | 85 g | 2+ |
| | 13.0 | ---- | 4+ |
| | 9.1 | 117 g | 3+ |
| | 9.6 | 154 g | 3+ |
| | 8.0 | 75 g | 2+ |
| | 11.6 | ---- | |
| Tomichi Point | 9.1 | ---- | 3+ |
| | 9.5 | ---- | 3+ |
| Gunnison Point | 9.2 | 126 g | 2+ |
| | 13.0 | 372 g | 2+ |
| | 12.4 | ---- | ---- |
| | 12.3 | ---- | ---- |
| | 12.4 | ---- | ---- |
| Warner Point | 11.7 | 257 g | 3+ |
| | 11.3 | 202 g | 4+ |
| | 16.3 | 610 g | 4+ |
| | 13.1 | 330 g | 3+ |
| | 9.4 | 130 g | 2+ |
| Red Rock Canyon | 13.2 | ---- | 3+ |
| | 16.0 | ---- | 4+ |
| | 10.7 | 209 g | 3+ |
| | 13.1 | 331 g | 3+ |

seven rainbow trout and 18 brown trout came from fishermen checked. This percentage when broken down shows a higher percentage of brown trout caught through the canyon outside of East Portal. Also the rainbow trout at East Portal were smaller on an average than those taken elsewhere inside the Monument. This probably is due to the stocking of rainbow trout at the East Portal. Considering all the information from throughout the canyon, the average brown trout ran 11.3 inches while the rainbow trout ran 12.9 inches. The net samples show 20.5% of trout taken were brown trout. Fishermen's catch was 15.3% brown trout for a total average of brown trout to rainbow trout of 16.9%. The range of brown trout ran from 8 to 16.3 inches. Each collection point is broken down (Table 2).

Bill Wiltzius of the Montrose Game and Fish aged the scale samples of the brown trout (Table 3).

CONCLUSION

Personally I believe that the normal reproduction of brown trout has decreased over the last ten years. I came to this conclusion because of two factors. One Vincent and Kinnear found nearly a one to one ratio of brown trout to rainbow trout (182-176) in the sample they collected. My sample showed about a 1 to 6 ratio of brown trout to rainbow trout. The other reason is, I do not see how the water fluctuation the year around would be beneficial to any natural reproduction. Also due to the dams there can be no migration to headwaters for spawning. More studies are needed to make any statements on reproduction of brown trout. New species found were northern pike and eagle sculpin. The pike was full of eggs. They may possibly be more numerous in following years. No trout were found to have color markings but more collection samples should be taken.

## SUMMARY

The gathering of information on fish species inside Black Canyon National Monument is difficult because all equipment must be backpacked into the river on steep routes, the Monument having no trails. Using fishermen's catch and gill net samples, this study showed two types of fish that had not been collected before inside the Monument. These were northern pike and eagle sculpin. Using a black light to identify marked fish, it is thought very few if any stocked trout from dams above lived coming through the turbines. About 16.9% of a fisherman's catch will be brown trout. Rainbow trout and brown trout provide excellent fishing for the active fisherman with average length on rainbow trout 12.9" and on brown trout 11.3". Brown trout still have natural reproduction but more studies are needed to find if the brown trout will continue to reproduce in the water fluctuations caused by the dam outputs.

## LITERATURE CITED

Kinnear, Brian S., and Robert E. Vincent. 1967. Fish and fish habitats in Black Canyon of the Gunnison National Monument. Colo. St. Univ. Fort Collins, Colorado. 45pp.

Sigler, William F., and Robert R. Miller. 1963. Fishes of Utah, Utah State Dept. Fish, Game. Salt Lake City, Utah. 203pp.

Wiltzius, Bill. 1975. Personal interview.

APPENDIX A. EQUIPMENT LIST

A. Loaned by Montrose Game and Fish Department.

1. One pound scale, Hanson Model 1411
2. Two Blak lights - Ultra Violet Product Incorporated Model M-16, San Gabriel, California
3. Two Blak light battery chargers, Ultra Violet Product Incorporated, Model J 330, San Gabriel, California
4. Five Zinc Cadmium batteries
5. Gill net - Nylon Net Company - 7 Vance Avenue P.O. Box 592, Memphis, Tennessee, 38101

B. Black Canyon National Monument equipment.

6. Backpack and frame
7. Spool of nylon thread for net repair
8. Cardboard box for black light area.
9. Eighteen inch wooden ruler Senco No. R501-18

CFS
Cubic fee
/ secon

APPENDIX B.

# Gunnison River Tunnel

| May 1975 | | | June 1975 | | | | July 1975 | | | Aug 197 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| By Pass | | Tunnel Flow | | | | | | | | | |
| 2733 | | 961 | 2890 | 2890 | 830 | | 983 | 720 | 427 | 230 | 96 |
| 2745 | | 963 | 2890 | 2530 | 830 | | 1006 | 760 | 427 | 230 | 96 |
| 3040 | | 963 | 2530 | 2140 | 823 | | 996 | 770 | 427 | 205 | 96 |
| 3090 | 2970 | 962 | 2458 | 2076 | 821 | -300 2.4 | 952 | 740 | 427 | 195 | 96 |
| 3090 | 2990 | 961 | 2220 | 2156 | 502 | | 1000 | 735 | 429 | 195 | 96 |
| 3110 | 3090 | 961 | 2341 | 2171 | 503 | | 1006 | 775 | 427 | 195 | 96 |
| 3170 | 3110 | 954 | 2260 | 2100 | 503 | | 994 | 790 | 427 | 195 | 96 |
| 3170 | 3090 | ~~968~~ ~~956~~ | 2180 | 2132 | 502 | | 1090 | 795 | 427 | 195 | 96 |
| 3210 | 310 | 970 | 2584 | 2132 | 501 | | 1570 | 1423 | 437 | 195 | 96 |
| 3290 | 3190 | 970 | 3090 | 2527 | 0 | | 1196 | 964 | 434 | 195 | 96 |
| 3330 | 3170 | 969 | 2527 | 2495 | 510 | | 1006 | 820 | 427 | 227 | 96 |
| 3190 | 3040 | 968 | 2602 | 2044 | 505 | | 922 | 720 | 429 | 211 | 96 |
| 3170 | 3090 | 968 | 2044 | 1430 | 501 | | 710 | 628 | 427 | 211 | 96 |
| 3370 | 1320 | 970 | 1975 | 1405 | 623 | +100 | 656 | 88 | 426 | 211 | 96 |
| 3340 | 3000 | 970 | 1577 | 1284 | 623 | | 488 | 148 | 968 | 219 | 96 |
| 3190 | 3000 | 970 | 1801 | 1528 | 623 | | 372 | 232 | 968 | 222 | 96 |
| 3040 | 2860 | 970 | 1563 | 1500 | 434 | -150 | 345 | 214 | 968 | 202 | 96 |
| 3290 | 3090 | 970 | 1570 | 1500 | 434 | | 2386 | 540 | 968 | 211 | 96 |
| 3340 | 3190 | 968 | 1556 | 1479 | 434 | | 584 | 500 | 968 | 345 | 96 |
| 3340 | 3210 | 834 | 1270 | 780 | 432 | +70 | 195 | 120 | 968 | 710 | 96 |
| 3200 | 3150 | 828 | 770 | 735 | 619 | | 268 | 111 | 965 | 255 | 96 |
| 3240 | 3150 | 828 | 745 | 720 | 619 | | 142 | 127 | 963 | 310 | 96 |
| 3170 | 3150 | 825 | 710 | 345 | 619 | | 214 | 120 | 963 | 288 | 96 |
| 3190 | 3190 | 825 | 397 | 328 | 610 | | 240 | 205 | 963 | 256 | 96 |
| 3200 | 3200 | 826 | 760 | 334 | 613 | | 233 | 205 | 963 | 244 | 96 |
| 3230 | 3190 | 826 | 662 | 612 | 427 | | 790 | 217 | 963 | 240 | 96 |
| 3290 | 3190 | 828 | 798 | 755 | 427 | | 668 | 140 | 962 | 270 | 96 |
| 3230 | 3230 | 832 | 956 | 730 | 427 | | 143 | 127 | 961 | 275 | 96 |
| 3270 | 3190 | 832 | 946 | 755 | 427 | | 205 | 120 | 958 | 725 | 96 |
| 3190 | 2990 | 832 | 928 | 750 | 427 | | 325 | 205 | 965 | 760 | 96 |
| 2990 | 2870 | 830 | | | | | 275 | 214 | 965 | 275 | 96 |

APPENDIX B.

| | Tunnel Flow |
|---|---|
| 247 | 963 |
| 251 | 963 |
| 254/34[illegible] | 965 |
| 251/237 | 965 |
| [illegible]/251 | 965 |
| 251/240 | 963 |
| 251/251 | 963 |
| 251/151 | 963 |
| [illegible]/251 | 963 |
| 275/258 | 963 |
| [illegible]/254 | 963 |
| [illegible]/254 | 963 |
| 279/256 | 963 |
| 279/26E | 963 |
| [illegible]/275 | 963 |
| [illegible]/3[illegible] | 963 |
| [illegible] | 977 |

APPENDIX C.

Temperature: Air ___ Water ___ Month June Station SEET

| Date | 19__ L | 19__ H | 19__ L | 19__ H | 19__ L | 19__ H | 19__ L | 19__ H | 19__ L | 19__ H | 19__ L | 19__ H | 19__ L | 19__ H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 51 | 50 | 54 | 54 | 54 | 51 | | | |
| | | | | | | 33 | 33 | 54 | 54 | 54 | 51 | | | |
| | | | | | | 34 | 34 | 55 | 54 | 53 | 51 | | | |
| | | | | | | 36 | 34 | 54 | 54 | 53 | 51 | | | |
| | | | | | | 34 | 34 | 55 | 54 | 51 | 50 | | | |
| | | | | | | 36 | 34 | 54 | 54 | 53 | 51 | | | |
| | | | | | | 36 | 34 | 55 | 54 | 53 | 51 | | | |
| | | | | | | 39 | 35 | 54 | 53 | 53 | 51 | | | |
| | | | | | | 53 | 52 | 55 | 54 | 53 | 52 | | | |
| | 35 | | | | | 54 | 52 | 55 | 54 | 52 | 51 | | | |
| | | | | | | 53 | 52 | 54 | 54 | | | | | |
| | | | | | | 53 | 52 | 55 | 54 | | 52 | | | |
| | | | | | | 54 | 52 | 55 | 54 | 53 | 51 | | | |
| | | | | | | 54 | 53 | 55 | 54 | | | | | |
| | 37 | | | | | 54 | 53 | 54 | 53 | | 51 | | | |
| | | | | | | 53 | 52 | 54 | 51 | | 51 | | | |
| | 36 | | | | | 53 | 53 | 55 | 51 | 53 | 51 | | | |
| | | | | | | 53 | 51 | 54 | 51 | 53 | 51 | | | |
| | | | | | | 54 | 53 | 53 | 51 | 53 | 51 | | | |
| | | | | | | 54 | 54 | 53 | 51 | 52 | 51 | | | |
| | | | | | | 55 | 54 | 53 | 51 | | 51 | | | |
| | 37 | 41 | 40 | 50 | 46 | 55 | 54 | 54 | 51 | 53 | 51 | | | |
| | | | | | | 55 | 55 | 54 | 52 | | | | | |
| | | | | | | 55 | 54 | 80 | 51 | | 51 | | | |
| | 37 | | | | | 55 | 54 | 80 | 49 | 52 | 51 | | | |
| | | | | | | 54 | 52 | 80 | 45 | | | | | |
| | | | | | | 54 | 53 | 80 | 50 | 52 | 51 | | | |
| | | | | | | 55 | 54 | 80 | 46 | 52 | 51 | | | |
| | | | | | | 54 | 54 | 53 | 50 | | | | | |
| | | | | | | 55 | 54 | 54 | 50 | | | | | |
| | | | | | | 54 | 54 | 54 | 51 | | | | | |
| L | | | | | | 1294 | 1269 | 1409 | 1365 | | | | | |
| G | | | | | | 53.9 | 52.8 | 54.1 | 52.5 | | | | | |
| HIGH | 40 | 37 | 44 | 42 | 51 | 43 | 55 | 55 | 55 | 54 | | | | |
| LOW | 37 | 36 | 37 | 37 | 42 | 41 | 51 | 49 | 53 | 50 | | | | |

Water Temperature
Water