

CHARACTER ANALYSIS SHEET

Species Salmo clarki pleuriticus

Locality _____

Field No. _____ Coll. by _____

Date of Coll. _____ Measurements by _____ Date _____

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

| | N | range | Mean | S.D. ² | S.D. | C.D. | SEM |
|---|---|---------|-------|-------------------|------|------|-----|
| Standard L | 3 | 147-263 | 215 | | | | |
| ✓ Body D | | 242-258 | 247.7 | | | | |
| ✓ Head L | | 247-258 | 250.7 | | | | |
| Head D | | 163-177 | 168.7 | | | | |
| Head W | | 115-143 | 129.0 | | | | |
| ✓ Least interorbital bony W | | 64-68 | 65.7 | | | | |
| Occiput to snout tip | | | | | | | |
| Snout L | | 51-61 | 55.0 | | | | |
| Orbit L | | 55-68 | 60.0 | | | | |
| ✓ Upper Jaw L | | 132-143 | 137.3 | | | | |
| ✓ Dorsal origin to snout tip | | 496-505 | 501.0 | | | | |
| Depressed dorsal to insertion of adipose | | | | | | | |
| Dorsal origin to anal o | | | | | | | |
| Dorsal fin basal L | | | | | | | |
| ✓ Dorsal fin depressed L | | 187-204 | 196.3 | | | | |
| ✓ Adipose fin depressed L | | 76-102 | 85.0 | | | | |
| ✓ Caudal peduncle D | | 103-109 | 106.0 | | | | |
| ✓ Caudal peduncle L | ✓ | 163-177 | 168.7 | | | | |
| ✓ Vertebrae | 0 | | | | | | |
| First arch gill rakers (upper) | 3 | | | | | | |
| (lower) | | | | | | | |
| ✓ (total) | | 19-20 | 19.7 | | | | |
| ✓ Basibranchial teeth | | 1-7 | 3.3 | | | | |
| ✓ Branchiostegal rays (right) | | 11 | 11.0 | | | | |
| (left) | | 11-12 | 11.3 | | | | |
| ✓ Pectoral fin rays | | 14-15 | 14.7 | | | | |
| Pelvic fin rays | | | | | | | |
| ✓ Scales in lateral line | | 120-126 | 122.3 | | | | |
| ✓ Scales above lateral line | ✓ | 41-49 | 45.3 | | | | |
| above | 1 | | | | | | |

CHARACTER ANALYSIS SHEET

Species S. c. planiticus

Locality Wagon Creek, Sublette Co. Wyoming

Field No. 110122 Coll. by Eugene Kuhne

Date of Coll. 8-10-34 Measurements by Behrke Date 12-15-58

Jar No. _____ No. of Jars _____ No. of Spec. 1 Specimen No. _____

| | | | | | |
|---|--------|--|--|--|--|
| Standard L | 147 | | | | |
| Body D | 38 | | | | |
| Head L | 38 | | | | |
| Head D | 26 | | | | |
| Head W | 21 | | | | |
| Least interorbital bony W | 10 | | | | |
| Occiput to snout tip | 26 | | | | |
| Snout L | 9 | | | | |
| Orbit L | 10 | | | | |
| Upper Jaw L | 21 | | | | |
| Dorsal origin to snout tip | 73 | | | | |
| Depressed dorsal to insertion of adipose | 28 | | | | |
| Dorsal origin to anal o | 52 | | | | |
| Dorsal fin basal L | 18 | | | | |
| Dorsal fin depressed-L | 30 | | | | |
| Adipose fin depressed L | 15 | | | | |
| Caudal peduncle D | 16 | | | | |
| Caudal peduncle L | 26 | | | | |
| Vertebrae | — | | | | |
| First arch gill rakers (upper) | 7 | | | | |
| (lower) | 13 | | | | |
| (total) | 20 | | | | |
| Basibranchial teeth | 1 | | | | |
| Branchiostegal rays (right) | 11 | | | | |
| (left) | 11 | | | | |
| Pectoral fin rays | 15 | | | | |
| Pelvic fin rays | 10 | | | | |
| Scales in lateral line | 120 | | | | |
| Scales above lateral line | 41 | | | | |
| above | 150-55 | | | | |

Typical upstream form (Green R. ^{etc.})
smaller, more profuse spotting (as in Utah ^{etc.})



2 = Mich. 110121 - Green R. Wyo. Sublette Co. - 2 above
Kendall Ranger Sta. - coll. - E. Kuhne - VIII-9-34

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species Salmo clarki pleuriticus

Locality Wyo. Sublette Co. - Green R. 5 mi. above Kendall Ranger Sta.

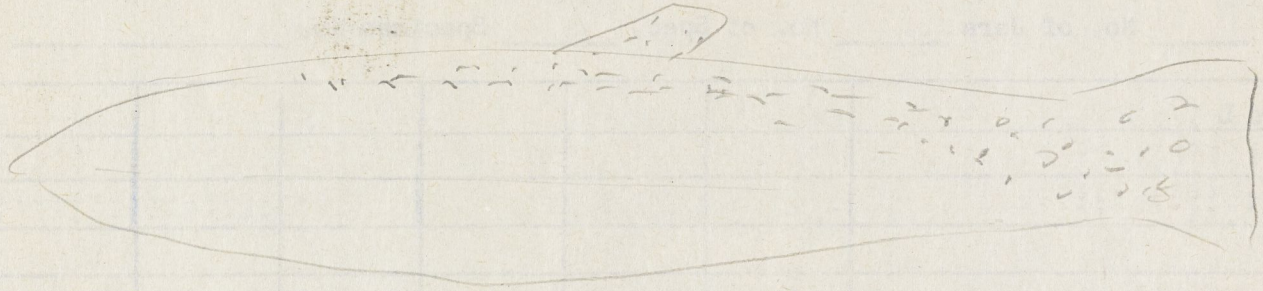
Field No. 110119 Coll. by Eugene Kuhne

Date of Coll. 8-8-34 Measurements by Behmke Date 12-10-58

Jar No. _____ No. of Jars 2 No. of Spec. 2 Specimen No. _____

| | 1 | 2 | | | | |
|---|-----|-----|--|--|--|--|
| Standard L | 263 | 235 | | | | |
| Body D | 64 | 57 | | | | |
| Head L | 65 | 58 | | | | |
| Head D | 43 | 39 | | | | |
| Head W | 34 | 27 | | | | |
| Least interorbital bony W | 17 | 15 | | | | |
| Occiput to snout tip | 44 | 38 | | | | |
| Snout L | 14 | 12 | | | | |
| Orbit L | 15 | 13 | | | | |
| Upper Jaw L | 36 | 31 | | | | |
| Dorsal origin to snout tip | 133 | 118 | | | | |
| Depressed dorsal to insertion of adipose | 51 | 39 | | | | |
| Dorsal origin to anal o | 91 | 82 | | | | |
| Dorsal fin basal L | 33 | 28 | | | | |
| Dorsal fin depressed L | 52 | 44 | | | | |
| Adipose fin depressed L | 20 | 18 | | | | |
| Caudal peduncle D | 27 | 25 | | | | |
| Caudal peduncle L | 43 | 39 | | | | |
| Vertebrae | | | | | | |
| First arch gill rakers (upper) | 7 | 7 | | | | |
| (lower) | 12 | 13 | | | | |
| (total) | 19 | 20 | | | | |
| Basibranchial teeth | 2 | 7 | | | | |
| Branchiostegal rays (right) | 11 | 11 | | | | |
| (left) | 11 | 12 | | | | |
| Pectoral fin rays | 15 | 14 | | | | |
| Pelvic fin rays | 9 | 9 | | | | |
| Scales in lateral line | 126 | 121 | | | | |
| Scales above lateral line | 46 | 49 | | | | |

this fish is the type that is characteristic
(or seems to be) of upper Colo. drainage and formerly
of Utah lake - spotting is smaller - color, lighter.



CHARACTER ANALYSIS SHEET

Species Salmo clarki pleuriticus

Locality N. Fork Escalante Creek, Mesa Co., Colo.

Field No. 141979 Coll. by Mich.

Date of Coll. Measurements by C.F. Reid Date Oct. 7, 1959

Jar No. No. of Jars No. of Spec. Specimen No.

| | N | range | Mean | S.D. ² | S.D. | C.D. | SEM |
|---|----|---------|-------|-------------------|--------|------|-------|
| Standard L | 12 | | | | | | |
| ✓ Body D | 1 | 226-270 | 250.5 | | | | |
| ✓ Head L | | 253-276 | 261.2 | | | | |
| Head D | | 162-181 | 172.9 | | | | |
| Head W | | | | | | | |
| ✓ Least interorbital bony W | | 56-68 | 63.0 | | | | |
| Occiput to snout tip | | 169-198 | 180.5 | | | | |
| Snout L | | 49-64 | 56.9 | | | | |
| Orbit L | | 60-78 | 67.8 | | | | |
| ✓ Upper Jaw L | | 135-151 | 143.8 | 30.335 | 5.508 | | 1.590 |
| ✓ Dorsal origin to snout tip | | 499-534 | 517.8 | | | | |
| Depressed dorsal to insertion of adipose | | | | | | | |
| Dorsal origin to anal o | | | | | | | |
| Dorsal fin basal L | | | | | | | |
| ✓ Dorsal fin depressed L | | 196-230 | 215.5 | 165.909 | 12.881 | | 3.718 |
| ✓ Adipose fin depressed L | | 70-95 | 86.4 | | | | |
| ✓ Caudal peduncle D | | 106-121 | 113.5 | 22.273 | 4.719 | | 1.362 |
| ✓ Caudal peduncle L | | 164-182 | 174.6 | 29.175 | 5.401 | | 1.559 |
| ✓ Vertebrae | | 61-63 | 62.0 | 0.545 | 0.738 | | 0.213 |
| First arch gill rakers (upper) | | | | | | | |
| (lower) | | | | | | | |
| ✓ (total) | | 15-20 | 18.3 | | | | |
| ✓ Basibranchial teeth | | 1-3 | 0.75 | | | | |
| ✓ Branchiostegal rays (right) | | 9-11 | 10.1 | 0.265 | 0.515 | | 0.149 |
| (left) | | 10-12 | 10.8 | 0.389 | 0.624 | | 0.180 |
| ✓ Pectoral fin rays | | 14-16 | 15.1 | | | | |
| Pelvic fin rays | | | | | | | |
| ✓ Scales in lateral line | ✓ | 116-121 | 118.8 | | | | |
| ✓ Scales above lateral line | 6 | 40-44 | 41.7 | | | | |

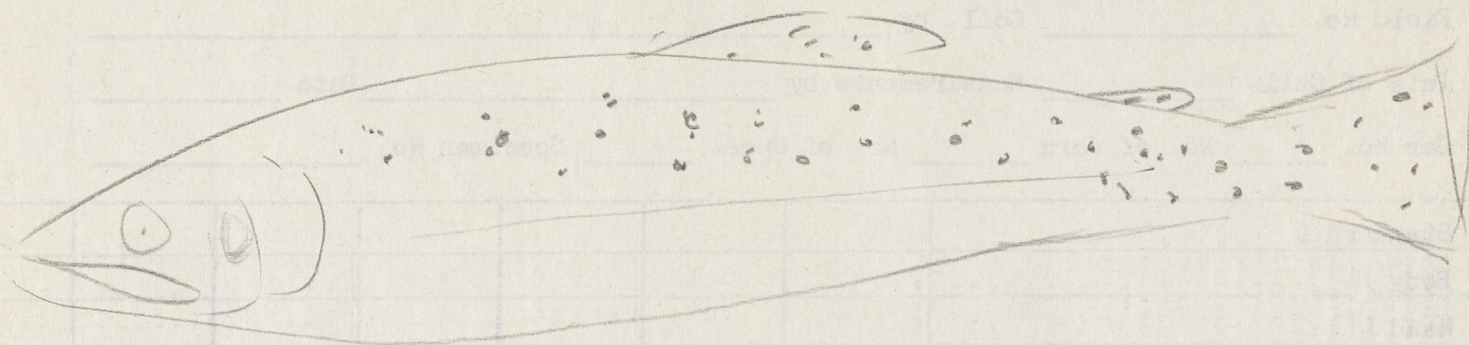
CHARACTER ANALYSIS SHEET

Species *S. c. pleuriticus*
 Locality Colo. - N. Fork Escalante Ck. Mesa Co.
 Field No. 141979 Coll. by J. T. Greenbank
 Date of Coll. No date Measurements by Behmke Date 12-16-58
 Jar No. 1 No. of Jars 1 No. of Spec. 12 Specimen No.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|-----|-----|----------|-----|-------------|-----|-----|
| Standard L | 166 | 146 | 152 | 147 | 116 | 122 | 126 |
| Body D | 43 | 33 | 39 | 38 | 30 | 33 | 31 |
| Head L | 42 | 37 | 41 | 39 | 32 | 32 | 32 |
| Head D | 28 | 24 | 27 | 26 | 21 | 21 | 22 |
| Head W | 23 | 19 | 22 | 20 | 16 | 17 | 16 |
| Least interorbital bony W | 11 | 9 | 10 | 10 | 7 | 8 | 8 |
| Occiput to snout tip | 28 | 26 | 27 | 27 | 23 | 23 | 22 |
| Snout L | 9 | 8 | 9 | 9 | 7 | 7 | 7 |
| Orbit L | 10 | 9 | 10 | 10 | 9 | 9 | 9 |
| Upper Jaw L | 23 | 20 | 23 | 22 | 17 | 18 | 17 |
| Dorsal origin to snout tip | 87 | 73 | 80 | 75 | 62 | 62 | 65 |
| Depressed dorsal to insertion of adipose | 26 | 28 | 27 | 25 | 19 | 20 | 20 |
| Dorsal origin to anal o | 57 | 52 | 52 | 52 | 40 | 42 | 42 |
| Dorsal fin basal L | 22 | 20 | 18 | 20 | 15 | 17 | 15 |
| Dorsal fin depressed L | 37 | 30 | 30 | 33 | 26 | 28 | 26 |
| Adipose fin depressed L | 15 | 12 | 14 | 14 | 10 | 11 | 11 |
| Caudal peduncle D | 20 | 16 | 18 | 17 | 13 | 14 | 14 |
| Caudal peduncle L | 28 | 26 | 25 | 26 | 20 | 21 | 23 |
| Vertebrae | 62 | 63 | 63 | 62 | 61 | 62 | 61 |
| First arch gill rakers (upper) | 7 | 6 | 8 | 7 | 7 | 7 | 6 |
| (lower) | 11 | 9 | 11 | 12 | 12 | 13 | 12 |
| (total) | 18 | 15 | 19 | 19 | 19 | 20 | 18 |
| Basibranchial teeth | 3 | 0 | 0 smooth | 0 | 1 very tiny | 0 | 0 |
| Branchiostegal rays (right) | 10 | 10 | 11 | 10 | 10 | 11 | 9 |
| (left) | 11 | 10 | 12 | 11 | 11 | 11 | 10 |
| Pectoral fin rays | 16 | 15 | 15 | 16 | 15 | 14 | 14 |
| Pelvic fin rays | 9 | 9 | 9 | 9 | 10 | 9 | 9 |
| Scales in lateral line | 117 | 120 | 117 | 119 | 120 | 121 | 116 |
| Scales above lateral line | — | 40 | — | 44 | — | 43 | — |

above 180-185 7/150

These seem intermediate between upstream
(small spots) and downstream (Large Spots) (Wyoming)
Colo & Utah



Species S. c. pleuriticus

Locality Calo. - N. Fork Escalante Ck. Mesa Co.

Field No. 141979 Coll. by J. T. Greenbank

Date of Coll. no date Measurements by Middletown Date 2-25-59

Jar No. _____ No. of Jars _____ No. of Spec. 12 Specimen No. _____

Measurements in thousands of standard length

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|-----|-----|-----|-----|-----|-----|-----|
| Standard L | 166 | 146 | 152 | 147 | 116 | 122 | 126 |
| Body D | 259 | 226 | 256 | 258 | 259 | 270 | 246 |
| Head L | 253 | 253 | 269 | 265 | 276 | 262 | 254 |
| Head D | 169 | 164 | 177 | 177 | 181 | 172 | 174 |
| Head W | 138 | 130 | 145 | 136 | 138 | 139 | 127 |
| Least interorbital bony W | 66 | 62 | 66 | 68 | 60 | 66 | 63 |
| Occiput to snout tip | 169 | 178 | 177 | 184 | 198 | 188 | 174 |
| Snout L | 54 | 55 | 59 | 61 | 60 | 57 | 56 |
| Orbit L | 60 | 62 | 66 | 68 | 78 | 74 | 71 |
| Upper Jaw L | 138 | 137 | 151 | 150 | 147 | 147 | 135 |
| Dorsal origin to snout tip | 524 | 499 | 526 | 510 | 534 | 508 | 515 |
| Depressed dorsal to insertion of adipose | 157 | 192 | 177 | 170 | 164 | 164 | 159 |
| Dorsal origin to anal o | 343 | 356 | 342 | 354 | 345 | 344 | 333 |
| Dorsal fin basal L | 132 | 137 | 118 | 136 | 129 | 139 | 119 |
| Dorsal fin depressed L | 223 | 205 | 197 | 224 | 224 | 229 | 206 |
| Adipose fin depressed L | 90 | 82 | 92 | 95 | 86 | 90 | 87 |
| Caudal peduncle D | 120 | 109 | 118 | 116 | 112 | 115 | 111 |
| Caudal peduncle L | 169 | 178 | 164 | 177 | 172 | 172 | 182 |

CHARACTER ANALYSIS SHEET

Species *S. c. pleuriticus*
 Locality Colo. N. Fork Escalante Ch. - Mesa Co.
 Field No. ^{Mich} 141979 Coll. by J. T. Greenbank
 Date of Coll. No date Measurements by Behrke Date 12-18-58
 Jar No. _____ No. of Jars _____ No. of Spec. 12 Specimen No. _____

| | <u>8</u> | <u>9</u> | <u>10</u> | <u>11</u> | <u>12</u> |
|--|----------|----------|-----------|-----------|-----------|
| Standard L | 139 | 123 | 142 | 143 | 140 |
| Body D | 34 | 33 | 33 | 35 | 34 |
| Head L | 36 | 33 | 36 | 37 | 37 |
| Head D | 24 | 22 | 23 | 24 | 25 |
| Head W | 18 | 17 | 19 | 19 | 19 |
| Least interorbital bony W | 9 | 7 | 8 | 9 | 9 |
| Occiput to snout tip | 25 | 24 | 24 | 25 | 25 |
| Snout L | 7 | 7 | 7 | 7 | 9 |
| Orbit L | 9 | 9 | 9 | 9 | 10 |
| Upper Jaw L | 20 | 18 | 20 | 20 | 21 |
| Dorsal origin to snout tip | 72 | 65 | 72 | 74 | 74 |
| Depressed dorsal to insertion of adipose | 22 | 20 | 25 | 25 | 22 |
| Dorsal origin to anal o | 48 | 43 | 48 | 48 | 48 |
| Dorsal fin basal L | 20 | 17 | 18 | 17 | 19 |
| Dorsal fin depressed L | 32 | 27 | 29 | 28 | 32 |
| Adipose fin depressed L | 12 | 11 | 11 | 10 | 13 |
| Caudal peduncle D | 15 | 14 | 15 | 16 | 17 |
| Caudal peduncle L | 24 | 22 | 25 | 26 | 24 |
| Vertebrae | 62 | 61 | 63 | 62 | 62 |
| First arch gill rakers (upper) | 7 | 7 | 8 | 7 | 6 |
| (lower) | 11 | 12 | 12 | 11 | 11 |
| (total) | 18 | 19 | 20 | 18 | 17 |
| Basibranchial teeth | 1 | 1 | 3 | 0 | 0 |
| Branchiostegal rays (right) | 10 | 10 | 10 | 10 | 10 |
| (left) | 10 | 11 | 10 | 11 | 11 |
| Pectoral fin rays | 15 | 15 | 15 | 16 | 15 |
| Pelvic fin rays | 9 | 9 | 10 | 9 | 9 |
| Scales in lateral line | 119 | 118 | 120 | 118 | 121 |
| Scales above lateral line | 41 | — | 42 | 40 | — |

Species S. c. pleuriticus

Locality Colo., N. Fork Escalante Ck. - Mesa Co.

Field No. 141979 Coll. by J. T. Greenbank

Date of Coll. No date ^{conversion} Measurements by Middlton Date 2-26-59

Jar No. _____ No. of Jars _____ No. of Spec. 12 Specimen No. _____

8 Measurements in thousands of 11 standard length

| | 8 | 9 | 10 | 11 | 12 |
|--|-----|-----|-----|-----|-----|
| Standard L | 139 | 123 | 142 | 143 | 140 |
| Body D | 244 | 268 | 232 | 245 | 243 |
| Head L | 259 | 268 | 253 | 259 | 264 |
| Head D | 173 | 179 | 162 | 168 | 179 |
| Head W | 129 | 138 | 134 | 133 | 136 |
| Least interorbital bony W | 65 | 57 | 56 | 63 | 64 |
| Occiput to snout tip | 180 | 195 | 169 | 175 | 179 |
| Snout L | 50 | 57 | 49 | 49 | 64 |
| Orbit L | 65 | 73 | 63 | 63 | 71 |
| Upper Jaw L | 144 | 146 | 141 | 140 | 150 |
| Dorsal origin to snout tip | 518 | 528 | 507 | 517 | 528 |
| Depressed dorsal to insertion of adipose | 158 | 163 | 176 | 175 | 157 |
| Dorsal origin to anal o | 345 | 350 | 338 | 336 | 343 |
| Dorsal fin basal L | 144 | 138 | 127 | 119 | 136 |
| Dorsal fin depressed L | 230 | 220 | 204 | 196 | 228 |
| Adipose fin depressed L | 86 | 89 | 77 | 70 | 93 |
| Caudal peduncle D | 108 | 114 | 106 | 112 | 121 |
| Caudal peduncle L | 173 | 179 | 176 | 182 | 171 |

CHARACTER ANALYSIS SHEET

Species Salmo clarki pleuriticus

Locality Various, Utah + Colorado

Field No. Mich. Coll. by _____

Date of Coll. _____ ^{calculations} Measurements by C.F. Reid Date Oct. 7, 1959

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

| | N | range | Mean | S.D. ² | S.D. | C.D. | SEM |
|---|----|---------|-------|-------------------|--------|------|-------|
| Standard L | 20 | | | | | | |
| ✓ Body D | 18 | 230-267 | 247.4 | | | | |
| ✓ Head L | 19 | 250-299 | 268.2 | | | | |
| Head D | | 163-188 | 175.1 | | | | |
| Head W | | | | | | | |
| ✓ Least interorbital bony W | | 59-71 | 64.6 | | | | |
| Occiput to snout tip | | 166-196 | 184.4 | | | | |
| Snout L | | 51-68 | 58.8 | | | | |
| Orbit L | | 61-80 | 70.7 | | | | |
| ✓ Upper Jaw L | | 132-169 | 146.8 | 96.142 | 9.805 | | 2.249 |
| ✓ Dorsal origin to snout tip | | 467-530 | 503.7 | | | | |
| Depressed dorsal to insertion of adipose | | | | | | | |
| Dorsal origin to anal o | | | | | | | |
| Dorsal fin basal L | | | | | | | |
| ✓ Dorsal fin depressed L | | 189-242 | 222.2 | 142.698 | 11.946 | | 2.741 |
| ✓ Adipose fin depressed L | | 74-102 | 88.8 | | | | |
| ✓ Caudal peduncle D | | 101-122 | 111.4 | 38.913 | 6.238 | | 1.431 |
| ✓ Caudal peduncle L | | 151-182 | 167.3 | 78.873 | 8.881 | | 2.037 |
| ✓ Vertebrae | 17 | 60-63 | 61.7 | 0.471 | 0.686 | | 0.166 |
| First arch gillrakers (upper) | | | | | | | |
| (lower) | | | | | | | |
| (total) | 20 | 15-21 | 18.4 | 2.032 | 1.425 | | 0.319 |
| ✓ Basibranchial teeth | 20 | 0-14 | 4.6 | | | | |
| ✓ Branchiostegal rays (right) | 20 | 9-11 | 9.9 | 0.347 | 0.589 | | 0.132 |
| (left) | 20 | 9-12 | 10.4 | 0.558 | 0.747 | | 0.167 |
| ✓ Pectoral finrays | 20 | 14-15 | 14.5 | | | | |
| Pelvic fin rays | | | | | | | |
| ✓ Scales in lateral line | 19 | 113-122 | 118.9 | | | | |
| ✓ Scales above lateral line | 15 | 38-44 | 41.4 | 4.400 | 2.098 | | 0.542 |

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

yes - see back

~~pleuriticus~~ - erased

Species Salmo clarki

Locality Utah: Currant Creek, just Rt. 40 1.8 mi. SE of N entrance

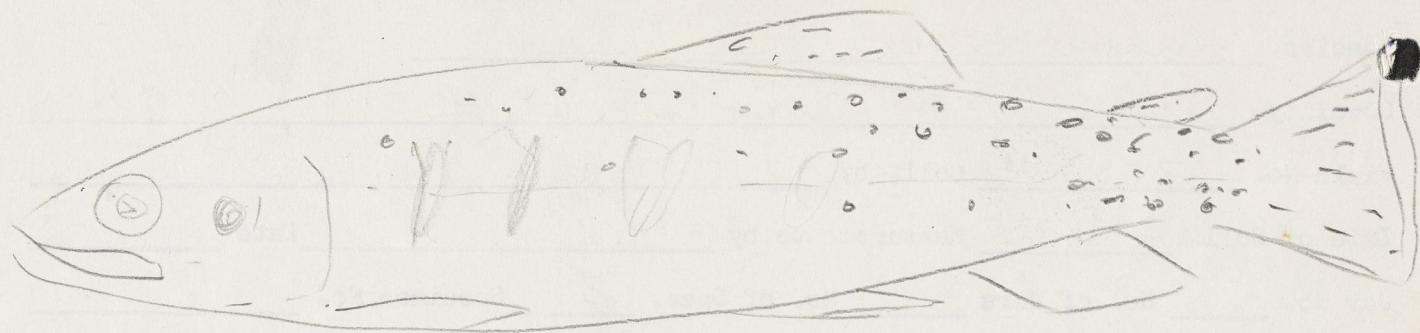
Field No. 167585 Coll. by Siegler, Hansen, Buckley ^{to Strawberry R.} Wasatch Co.

Date of Coll. not given Measurements by Behinke Date 12-18-58

Jar No. _____ No. of Jars _____ No. of Spec. 3 Specimen No. _____

| | 1 | 2 | 3 |
|---|-----|-----|-----|
| Standard L | 113 | 147 | 148 |
| Body D | 27 | 34 | 36 |
| Head L | 31 | 39 | 37 |
| Head D | 20 | 24 | 25 |
| Head W | 15 | 19 | 19 |
| Least interorbital bony W | 7 | 9 | 10 |
| Occiput to snout tip | 22 | 26 | 26 |
| Snout L | 7 | 8 | 8 |
| Orbit L | 9 | 9 | 10 |
| Upper Jaw L | 16 | 21 | 21 |
| Dorsal origin to snout tip | 57 | 73 | 73 |
| Depressed dorsal to insertion of adipose | 19 | 24 | 24 |
| Dorsal origin to anal o | 39 | 50 | 52 |
| Dorsal fin basal L | 16 | 19 | 21 |
| Dorsal fin depressed L | 26 | 33 | 33 |
| Adipose fin depressed L | 10 | 11 | 12 |
| Caudal peduncle D | 13 | 15 | 17 |
| Caudal peduncle L | 20 | 26 | 27 |
| Vertebrae | 62 | 62 | 62 |
| First arch gill rakers (upper) | 7 | 7 | 7 |
| (lower) | 13 | 12 | 11 |
| (total) | 20 | 19 | 18 |
| Basibranchial teeth | 5 | 5 | 9 |
| Branchiostegal rays (right) | 11 | 10 | 11 |
| (left) | 12 | 11 | 11 |
| Pectoral fin rays | 15 | 14 | 15 |
| Pelvic fin rays | 9 | 9 | 9 |
| Scales in lateral line | 117 | 121 | 121 |
| Scales above lateral line | 42 | 39 | 43 |

Spots are sparse but fairly large



probably pleuriticus for - This
is in Colo. drainage - just over the
divide.

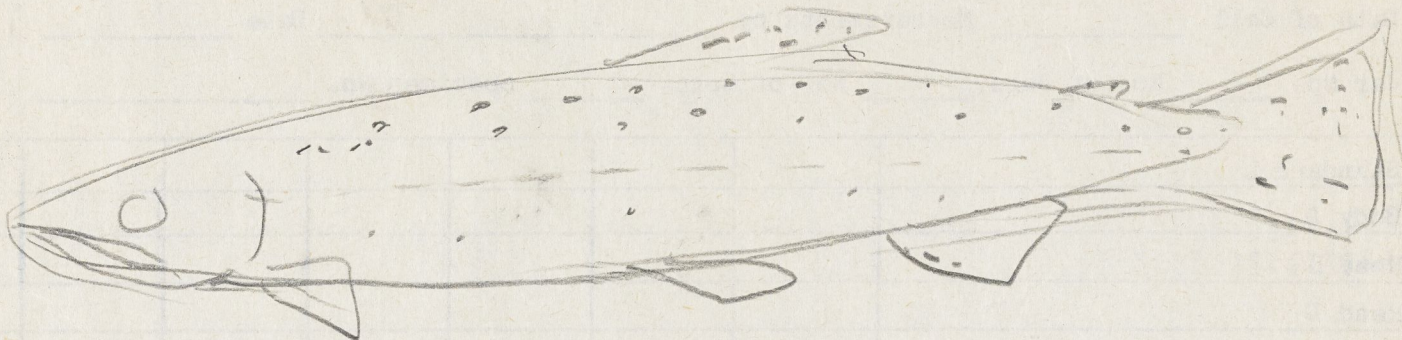
CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species *S. c. pleuriticus*
 Locality Colo. - W. Fork Dry Cr. near Olathe - Montrose Co.
 Mich. Field No. 136708 Coll. by Preston Knuch
 Date of Coll. 8-31-41 Measurements by Belinke Date 12-18-58
 Jar No. _____ No. of Jars _____ No. of Spec. 3 Specimen No. _____

| | <u>1</u> | <u>2</u> | <u>3</u> | | | |
|---|----------|----------|----------|--|--|--|
| Standard L | 139 | 132 | 128 | | | |
| Body D | 32 | 33 | 33 | | | |
| Head L | 35 | 33 | 33 | | | |
| Head D | 23 | 24 | 23 | | | |
| Head W | 18 | 18 | 17 | | | |
| Least interorbital bony W | 9 | 8 | 8 | | | |
| Occiput to snout tip | 24 | 23 | 23 | | | |
| Snout L | 8 | 8 | 7 | | | |
| Orbit L | 9 | 9 | 8 | | | |
| Upper Jaw L | 19 | 18 | 18 | | | |
| Dorsal origin to snout tip | 65 | 63 | 60 | | | |
| Depressed dorsal to insertion of adipose | 23 | 21 | 21 | | | |
| Dorsal origin to anal o | 48 | 46 | 43 | | | |
| Dorsal fin basal L | 22 | 19 | 15 | | | |
| Dorsal fin depressed L | 33 | 30 | 29 | | | |
| Adipose fin depressed L | 13 | 11 | 11 | | | |
| Caudal peduncle D | 14 | 16 | 14 | | | |
| Caudal peduncle L | 23 | 22 | 22 | | | |
| Vertebrae | 62 | 62 | 61 | | | |
| First arch gill rakers (upper) | 8 | 5 | 8 | | | |
| (lower) | 12 | 10 | 11 | | | |
| (total) | 20 | 15 | 19 | | | |
| Basibranchial teeth | 2 | 1 | 0 | | | |
| Branchiostegal rays (right) | 10 | 10 | 10 | | | |
| (left) | 10 | 10 | 11 | | | |
| Pectoral fin rays | 15 | 14 | 15 | | | |
| Pelvic fin rays | 10 | 10 | 10 | | | |
| Scales in lateral line | 122 | 120 | 120 | | | |
| Scales above lateral line | 38 | 38 | 44 | | | |

- very sparsely spotted w/ med. size
spot



Species S. c. pleuriticus

Locality Colo. - W. Fork Dry Cr. near Olathe - Montrose Co.

Field No. 136708 Coll. by Preston Knock

Date of Coll. 8-31-41 ^{conversions} Measurements by Middleton Date 2-27-59

Jar No. _____ No. of Jars _____ No. of Spec. 3 Specimen No. _____

Measurements 3 in thousands of standard length

| | 1 | 2 | 3 | | | | |
|---|-----|-----|-----|--|--|--|--|
| Standard L | 139 | 132 | 128 | | | | |
| Body D | 230 | 250 | 258 | | | | |
| Head L | 252 | 250 | 258 | | | | |
| Head D | 165 | 182 | 180 | | | | |
| Head W | 129 | 136 | 133 | | | | |
| Least interorbital bony W | 65 | 61 | 62 | | | | |
| Occiput to snout tip | 173 | 174 | 180 | | | | |
| Snout L | 58 | 61 | 55 | | | | |
| Orbit L | 65 | 68 | 62 | | | | |
| Upper Jaw L | 137 | 136 | 141 | | | | |
| Dorsal origin to snout tip | 467 | 477 | 469 | | | | |
| Depressed dorsal to insertion of adipose | 165 | 159 | 164 | | | | |
| Dorsal origin to anal o | 345 | 348 | 336 | | | | |
| Dorsal fin basal L | 158 | 144 | 117 | | | | |
| Dorsal fin depressed L | 237 | 227 | 226 | | | | |
| Adipose fin depressed L | 93 | 83 | 86 | | | | |
| Caudal peduncle D | 101 | 121 | 109 | | | | |
| Caudal peduncle L | 165 | 167 | 172 | | | | |

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species S. c. pleuriticus

Locality E. Fork Dry Creek, Colorado at Highway 90.

Field No. 134658 Coll. by Preston Knouch

Date of Coll. 9-14-41 Measurements by Behrke Date 12-15-58

Jar No. 1 No. of Jars 1 No. of Spec. 4 Specimen No. _____

| | 1 | 2 | 3 | 4 |
|--|-------------|-----|-----|----------|
| Standard L | 154 5 4 454 | 120 | 132 | 142 |
| Body D | 41 | 32 | 33 | 36 |
| Head L | 46 | 34 | 37 | 39 |
| Head D | 29 | 22 | 24 | 25 |
| Head W | 24 | 18 | 19 | 20 |
| Least interorbital bony W | 11 | 8 | 9 | 10 |
| Occiput to snout tip | 30 | 23 | 25 | 26 |
| Snout L | 10 | 7 | 9 | 8 |
| Orbit L | 11 | 9 | 10 | 10 |
| Upper Jaw L | 26 | 19 | 21 | 21 |
| Dorsal origin to snout tip | 80 | 61 | 68 | 74 |
| Depressed dorsal to insertion of adipose | 24 | 17 | 21 | 23 |
| Dorsal origin to anal o | 53 | 42 | 46 | 49 |
| Dorsal fin basal L | 20 | 18 | 17 | 17 |
| Dorsal fin depressed L | 35 | 29 | 28 | 29 |
| Adipose fin depressed L | 15 | 10 | 13 | 13 |
| Caudal peduncle D | 17 | 14 | 14 | 15 |
| Caudal peduncle L | 26 | 21 | 22 | 24 |
| Vertebrae | 61 | 62 | 62 | 61 |
| First arch gill rakers (upper) | 7 | 7 | 8 | 6 |
| (lower) | 11 | 10 | 11 | 11 |
| (total) | 18 | 17 | 19 | 17 |
| Basibranchial teeth | 2 | 0 | 2 | 2 |
| Branchiostegal rays (right) | 9 | 10 | 9 | 9 |
| (left) | 10 | 10 | 10 | 9 |
| Pectoral fin rays | 14 | 15 | 14 | 14 |
| Pelvic fin rays | 9 | 9 | 9 | abberant |
| Scales in lateral line | 120 | 120 | 117 | 121 |
| Scales above lateral line | 42 | 39 | 43 | 41 |
| above | 185-190 | | | |
| Ticket 5 ang | 187 | 188 | 180 | 195 |



large sparse
spots

Species S.c. pleuriticus

Locality E. Fork Dry Creek, Colorado at Highway 90

Field No. 134658 Coll. by Preston Knock

Date of Coll. 9-14-41 ^{conversions} Measurements by Middletown Date 2-27-59

Jar No. 1 No. of Jars 1 No. of Spec. 4 Specimen No. _____

Measurements in thousands of standard length

| | 1 | 2 | 3 | 4 |
|--|-----|-----|-----|-----|
| Standard L | 154 | 120 | 132 | 142 |
| Body D | 266 | 267 | 250 | 253 |
| Head L | 299 | 283 | 280 | 275 |
| Head D | 188 | 183 | 182 | 176 |
| Head W | 156 | 150 | 144 | 141 |
| Least interorbital bony W | 71 | 67 | 68 | 70 |
| Occiput to snout tip | 195 | 192 | 189 | 183 |
| Snout L | 65 | 58 | 68 | 56 |
| Orbit L | 71 | 75 | 76 | 70 |
| Upper Jaw L | 169 | 158 | 159 | 148 |
| Dorsal origin to snout tip | 519 | 508 | 515 | 521 |
| Depressed dorsal to insertion of adipose | 156 | 142 | 159 | 162 |
| Dorsal origin to anal o | 344 | 350 | 348 | 345 |
| Dorsal fin basal L | 130 | 150 | 129 | 120 |
| Dorsal fin depressed L | 227 | 242 | 212 | 204 |
| Adipose fin depressed L | 97 | 83 | 98 | 92 |
| Caudal peduncle D | 110 | 117 | 106 | 106 |
| Caudal peduncle L | 169 | 175 | 167 | 169 |

sparsely spotted w/ large spot

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species S. c. pleuriticus
Locality Colo. - Roubideau Cr. at Roubideau
Mich. Field No. 134656 Coll. by Preston Knoch
Date of Coll. 12-14-41 Measurements by Behrke Date 12-18-58
Jar No. _____ No. of Jars _____ No. of Spec. 2 Specimen No. _____

| | | | | | | |
|--|----------|-----|--|--|--|--|
| Standard L | 102 | 96 | | | | |
| Body D | 25 | | | | | |
| Head L | 27 | | | | | |
| Head D | 18 | | | | | |
| Head W | 14 | | | | | |
| Least interorbital bony W | 6 | | | | | |
| Occiput to snout tip | 20 | | | | | |
| Snout L | 6 | | | | | |
| Orbit L | 8 | | | | | |
| Upper Jaw L | 15 | | | | | |
| Dorsal origin to snout tip | 53 | | | | | |
| Depressed dorsal to insertion of adipose | 15 | | | | | |
| Dorsal origin to anal o | 34 | | | | | |
| Dorsal fin basal L | 14 | | | | | |
| Dorsal fin depressed L | 22 | | | | | |
| Adipose fin depressed L | 9 | | | | | |
| Caudal peduncle D | 11 | | | | | |
| Caudal peduncle L | 18 | | | | | |
| Vertebrae | 61 | / | | | | |
| First arch gill rakers (upper) | 8 | 8 | | | | |
| (lower) | 11 | 11 | | | | |
| (total) | 19 | 19 | | | | |
| Basibranchial teeth | 2 | 7 | | | | |
| Branchiostegal rays (right) | 10 | 10 | | | | |
| (left) | 11 | 10 | | | | |
| Pectoral fin rays | 15 | 15 | | | | |
| Pelvic fin rays | 9 | 9 | | | | |
| Scales in lateral line | 113 | 119 | | | | |
| Scales above lateral line | / | 42 | | | | |
| <i>cut on</i> | 924, 170 | | | | | |

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species *S. c. pleuriticus*
 Locality Colo., Payne Ck., trib. of Little Dolores R., Mesa Co.
 Mich. 134662 Coll. by Preston Knovich
 Date of Coll. 9-16-41 Measurements by Behrke Date 12-22-58
 Jar No. _____ No. of Jars _____ No. of Spec. 3 Specimen No. _____

| | 1 | 2 | 3 | | | |
|---|---------|-----|-----|--|--|--|
| Standard L | 163 | 151 | 149 | | | |
| Body D | 39 | 39 | 38 | | | |
| Head L | 42 | 39 | 40 | | | |
| Head D | 28 | 26 | 26 | | | |
| Head W | 22 | 21 | 21 | | | |
| Least interorbital bony W | 11 | 10 | 10 | | | |
| Occiput to snout tip | 27 | 27 | 28 | | | |
| Snout L | 9 | 9 | 8 | | | |
| Orbit L | 11 | 10 | 10 | | | |
| Upper Jaw L | 23 | 20 | 21 | | | |
| Dorsal origin to snout tip | 79 | 77 | 74 | | | |
| Depressed dorsal to insertion of adipose | 27 | 25 | 26 | | | |
| Dorsal origin to anal o | 60 | 53 | 53 | | | |
| Dorsal fin basal L | 24 | 22 | 22 | | | |
| Dorsal fin depressed L | 38 | 34 | 34 | | | |
| Adipose fin depressed L | 14 | 15 | 14 | | | |
| Caudal peduncle D | 19 | 17 | 17 | | | |
| Caudal peduncle L | 25 | 26 | 24 | | | |
| Vertebrae | 62 | 62 | 62 | | | |
| First arch gill rakers (upper) | 7 | 7 | 7 | | | |
| (lower) | 12 | 11 | 12 | | | |
| (total) | 19 | 18 | 19 | | | |
| Basibranchial teeth | 9 | 7 | 4 | | | |
| Branchiostegal rays (right) | 10 | 10 | 10 | | | |
| (left) | 11 | 11 | 10 | | | |
| Pectoral fin rays | 15 | 14 | 15 | | | |
| Pelvic fin rays | 19 | 9 | 9 | | | |
| Scales in lateral line | 121 | 120 | 119 | | | |
| Scales above lateral line | 44 | 43 | 43 | | | |
| | 170-175 | | | | | |

Typical for this area - large spots, - larger
& more numerous near caudal

small spot

no spots

CHARACTER ANALYSIS SHEET

area of large spots

Species S. c. pleuriticus

Locality Colo. Payne Ck., trib. of Little Dolores R.

Field No. 136705 Coll. by Preston Knoch

Date of Coll. 7-24-41 Measurements by Behrke Date 12-19-58

Jar No. _____ No. of Jars _____ No. of Spec. 1 Specimen No. _____

| | | | | | | |
|--|-----|--|--|--|--|--|
| Standard L | 178 | | | | | |
| Body D | | | | | | |
| Head L | 52 | | | | | |
| Head D | 32 | | | | | |
| Head W | 25 | | | | | |
| Least interorbital bony W | 12 | | | | | |
| Occiput to snout tip | 35 | | | | | |
| Snout L | 12 | | | | | |
| Orbit L | 14 | | | | | |
| Upper Jaw L | 29 | | | | | |
| Dorsal origin to snout tip | 91 | | | | | |
| Depressed dorsal to insertion of adipose | 24 | | | | | |
| Dorsal origin to anal o | 60 | | | | | |
| Dorsal fin basal L | 24 | | | | | |
| Dorsal fin depressed L | 39 | | | | | |
| Adipose fin depressed L | 16 | | | | | |
| Caudal peduncle D | 21 | | | | | |
| Caudal peduncle L | 27 | | | | | |
| Vertebrae | 60 | | | | | |
| First arch gill rakers (upper) | 0 | | | | | |
| (lower) | 12 | | | | | |
| (total) | 18 | | | | | |
| Basibranchial teeth | 4 | | | | | |
| Branchiostegal rays (right) | 9 | | | | | |
| (left) | 10 | | | | | |
| Pectoral fin rays | 14 | | | | | |
| Pelvic fin rays | 9 | | | | | |
| Scales in lateral line | 114 | | | | | |
| Scales above lateral line | 40 | | | | | |

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species S. c. pleuriticus

Locality Colo: Washington Gulch, 8 mi. N. of Crested Butte

Field No. 1020718 Coll. by W.P. & Dorothy Knoch Gunnison Co.

Date of Coll. 7-2-50 Measurements by Behrke Date 12-22-58

Jar No. _____ No. of Jars _____ No. of Spec. 2 Specimen No. _____

| | 1 | 2 | | | | |
|---|-----|-----|--|--|--|--|
| Standard L | 147 | 117 | | | | |
| Body D | 37 | 29 | | | | |
| Head L | 41 | 32 | | | | |
| Head D | 26 | 20 | | | | |
| Head W | 20 | 14 | | | | |
| Least interorbital bony W | 10 | 7 | | | | |
| Occiput to snout tip | 28 | 22 | | | | |
| Snout L | 9 | 7 | | | | |
| Orbit L | 10 | 9 | | | | |
| Upper Jaw L | 23 | 17 | | | | |
| Dorsal origin to snout tip | 78 | 60 | | | | |
| Depressed dorsal to insertion of adipose | 21 | 17 | | | | |
| Dorsal origin to anal o | 48 | 38 | | | | |
| Dorsal fin basal L | 19 | 15 | | | | |
| Dorsal fin depressed L | 33 | 26 | | | | |
| Adipose fin depressed L | 15 | 11 | | | | |
| Caudal peduncle D | 18 | 12 | | | | |
| Caudal peduncle L | 24 | 20 | | | | |
| Vertebrae | 62 | 63 | | | | |
| First arch gill rakers (upper) | 6 | 6 | | | | |
| (lower) | 11 | 10 | | | | |
| (total) | 17 | 16 | | | | |
| Basibranchial teeth | 4 | 3 | | | | |
| Branchiostegal rays (right) | 10 | 9 | | | | |
| (left) | 10 | 9 | | | | |
| Pectoral fin rays | 14 | 14 | | | | |
| Pelvic fin rays | 8 | 9 | | | | |
| Scales in lateral line | 120 | — | | | | |
| Scales above lateral line | — | — | | | | |

Sort of intermediate - but toward
larger spotting.

Species S. c. pleuriticus
 Locality Colo. Hizzard Head Pass, Dolores R. - Dolores Co.
 Mich. Field No. 160717 Coll. by W. P. & Dorothy Knuch
 Date of Coll. VII-3-50 Measurements by Behrke Date 12-11-58
 Jar No. _____ No. of Jars _____ No. of Spec. 2 Specimen No. _____

| | <u>1</u> | <u>2</u> | | | | |
|---|----------|----------|--|--|--|--|
| Standard L | 153 | 136 | | | | |
| Body D | 36 | 32 | | | | |
| Head L | 40 | 35 | | | | |
| Head D | 26 | 23 | | | | |
| Head W | 22 | 20 | | | | |
| Least interorbital bony W | 9 | 8 | | | | |
| Occiput to snout tip | 27 | 26 | | | | |
| Snout L | 9 | 7 | | | | |
| Orbit L | 11 | 10 | | | | |
| Upper Jaw L | 22 | 20 | | | | |
| Dorsal origin to snout tip | 79 | 71 | | | | |
| Depressed dorsal to insertion of adipose | 22 | 24 | | | | |
| Dorsal origin to anal o | 53 | 47 | | | | |
| Dorsal fin basal L | 19 | 17 | | | | |
| Dorsal fin depressed L | 29 | 29 | | | | |
| Adipose fin depressed L | 13 | 10 | | | | |
| Caudal peduncle D | 17 | 15 | | | | |
| Caudal peduncle L | 24 | 21 | | | | |
| Vertebrae | / | / | | | | |
| First arch gill rakers (upper) | 9 | 7 | | | | |
| (lower) | 12 | 12 | | | | |
| (total) | 21 | 19 | | | | |
| Basibranchial teeth | 9 | 14 | | | | |
| Branchiostegal rays (right) | 10 | 10 | | | | |
| (left) | 11 | 10 | | | | |
| Pectoral fin rays | 14 | 15 | | | | |
| Pelvic fin rays | 9 | 9 | | | | |
| Scales in lateral line | 114 | 120 | | | | |
| Scales above lateral line | / | / | | | | |
| above | 155-160 | / | | | | |

large spotted (typical lower River form)

Species Salmo clarki pleuriticus

Locality Busk Creek, East Portal Carlton Tunnel, Lake Co., Colo.

Field No. 164912 Coll. by Mich.

Date of Coll. Calculations Measurements by C.F. Reid Date Oct. 7, 1959

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

| | N | range | Mean | S.D. ² | S.D. | C.D. | SEM |
|--------------------------------|---|---------|-------|-------------------|------|------|-----|
| Standard L | 3 | | | | | | |
| ✓ Body D | | 234-250 | 240.7 | | | | |
| ✓ Head L | | 267-278 | 271.7 | | | | |
| Head D | | 180-181 | 180.3 | | | | |
| Head W | | | | | | | |
| ✓ Least interorbital bony W | | 60-72 | 66.0 | | | | |
| Occiput to snout tip | | | | | | | |
| Snout L | | 60-66 | 63.0 | | | | |
| Orbit L | | 78-82 | 80.3 | | | | |
| ✓ Upper Jaw L | | 147-164 | 154.7 | | | | |
| ✓ Dorsal origin to snout tip | | 500-517 | 510.0 | | | | |
| Depressed dorsal to | | | | | | | |
| insertion of adipose | | | | | | | |
| Dorsal origin to anal o | | | | | | | |
| Dorsal fin basal L | | | | | | | |
| ✓ Dorsal fin depressed L | | 233-238 | 235.0 | | | | |
| ✓ Adipose fin depressed L | | 86-90 | 88.7 | | | | |
| ✓ Caudal peduncle D | | 108-115 | 111.7 | | | | |
| ✓ Caudal peduncle L | | 164-172 | 169.0 | | | | |
| ✓ Vertebrae | | 60-61 | 60.7 | | | | |
| First arch gill rakers (upper) | | | | | | | |
| (lower) | | | | | | | |
| ✓ (total) | | 20-22 | 21.3 | | | | |
| ✓ Basibranchial teeth | | 0 | 0 | | | | |
| ✓ Branchiostegal rays (right) | | 9-10 | 9.7 | | | | |
| ✓ (left) | | 9-11 | 10.0 | | | | |
| ✓ Pectoral fin rays | | 15 | 15.0 | | | | |
| Pelvic fin rays | | | | | | | |
| ✓ Scales in lateral line | | 115-119 | 117.0 | | | | |
| ✓ Scales above lateral line | | 39-43 | 41.0 | | | | |

CHARACTER ANALYSIS SHEET

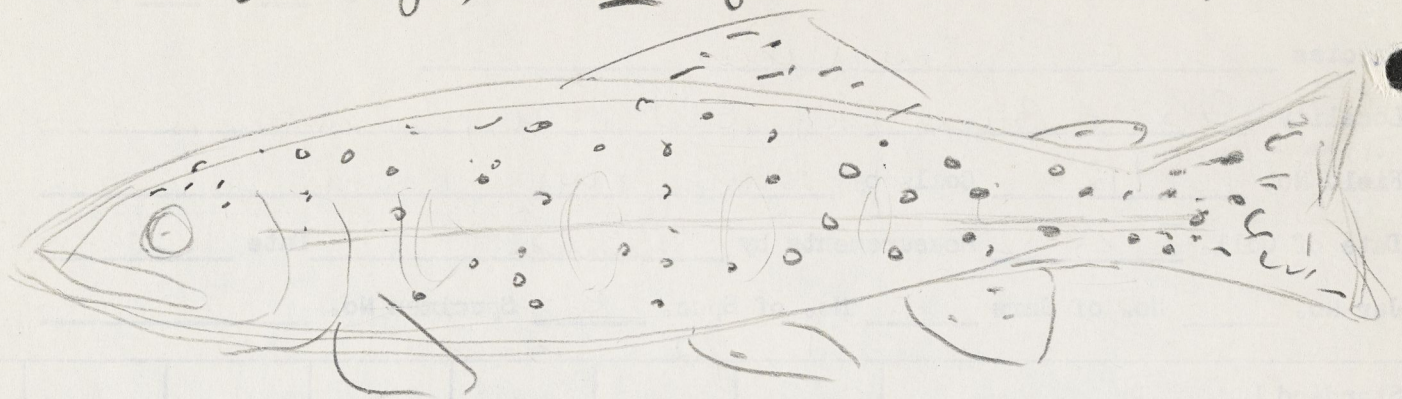
Page 1 of 1 pages.

Species S. c. pleuriticus
 Locality Colo. Busk Ck, East Portal, Carlton Tunnel - Lake Co.
 Mich
 Field No. 164912 Coll. by Dorothy & Wm. Knoch
 Date of Coll. 7-26-52 Measurements by Behrde Date 12-22-58
 Jar No. _____ No. of Jars _____ No. of Spec. 3 Specimen No. _____

| | 1 | 2 | 3 | | | |
|---|-----|-----|-------|--|--|--|
| Standard L | 122 | 111 | 116 | | | |
| Body D | 29 | 26 | 29 | | | |
| Head L | 34 | 30 | 31 | | | |
| Head D | 22 | 20 | 21 | | | |
| Head W | 18 | 15 | 16 | | | |
| Least interorbital bony W | 8 | 8 | 7 | | | |
| Occiput to snout tip | 25 | 22 | 23 | | | |
| Snout L | 8 | 7 | 7 | | | |
| Orbit L | 10 | 9 | 9 | | | |
| Upper Jaw L | 20 | 17 | 17 | | | |
| Dorsal origin to snout tip | 61 | 57 | 60 | | | |
| Depressed dorsal to insertion of adipose | 18 | 17 | 17 | | | |
| Dorsal origin to anal o | 42 | 38 | 39 | | | |
| Dorsal fin basal L | 18 | 15 | 17 | | | |
| Dorsal fin depressed L | 29 | 26 | 27 | | | |
| Adipose fin depressed L | 11 | 10 | 10 | | | |
| Caudal peduncle D | 14 | 12 | 13 | | | |
| Caudal peduncle L | 20 | 19 | 20 | | | |
| Vertebrae | 61 | 61 | 60 | | | |
| First arch gill rakers (upper) | 10 | 9 | 8 | | | |
| (lower) | 12 | 13 | 12 | | | |
| (total) | 22 | 22 | 20 | | | |
| Basibranchial teeth | 0* | 0 | 0 | | | |
| Branchiostegal rays (right) | 10 | 9 | 10 | | | |
| (left) | 11 | 9 | 10 | | | |
| Pectoral fin rays | 15 | 15 | 15 | | | |
| Pelvic fin rays | 10 | 9 | 9 | | | |
| Scales in lateral line | 115 | 119 | 117 | | | |
| Scales above lateral line | 43 | 39 | 44.41 | | | |

*-had been worked over & may have been knocked off

- Fairly large, evenly distributed spots



The spotting, & high gill raker count (20, 22, 22) suggests hunsbawi that has been intermuled. The absence of basibranchial teeth suggests rainbow or perhaps stomias.

Species Salmo clarki pleuriticus

Locality Hill Creek, 1 1/2 mi above So. Fork White R., Buford Co., Colo.

UMMZ

Field No. 158434 Coll. by _____

Date of Coll. _____ ^{Calculations} Measurements by C. F. Reid Date Oct. 7, 1959

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

| | N | range | Mean | S.D. ² | S.D. | C.D. | SEM |
|--------------------------------|---|---------|-------|-------------------|------|------|-----|
| Standard L | 2 | | | | | | |
| ✓ Body D | | 239-255 | 247.0 | | | | |
| ✓ Head L | | 253-272 | 262.5 | | | | |
| Head D | | 169-178 | 173.5 | | | | |
| Head W | | | | | | | |
| ✓ Least interorbital bony W | | 72-75 | 73.5 | | | | |
| Occiput to snout tip | | | | | | | |
| Snout L | | 61-67 | 64.0 | | | | |
| Orbit L | | | | | | | |
| ✓ Upper Jaw L | | 155 | 155.0 | | | | |
| ✓ Dorsal origin to snout tip | | 492-516 | 504.0 | | | | |
| Depressed dorsal to | | | | | | | |
| insertion of adipose | | | | | | | |
| Dorsal origin to anal o | | | | | | | |
| Dorsal fin basal L | | | | | | | |
| ✓ Dorsal fin depressed L | ✓ | 205-216 | 210.5 | | | | |
| ✓ Adipose fin depressed L | 1 | 80 | 80.0 | | | | |
| ✓ Caudal peduncle D | 2 | 108-111 | 109.5 | | | | |
| ✓ Caudal peduncle L | | 159-167 | 163.0 | | | | |
| ✓ Vertebrae | | 61-62 | 61.5 | | | | |
| First arch gill rakers (upper) | | | | | | | |
| (lower) | | | | | | | |
| ✓ (total) | | 19-22 | 20.5 | | | | |
| ✓ Basibranchial teeth | | 13-17 | 15.0 | | | | |
| ✓ Branchiostegal rays (right) | | 10-11 | 10.5 | | | | |
| ✓ (left) | | 10-11 | 10.5 | | | | |
| ✓ Pectoral fin rays | | 15 | 15.0 | | | | |
| Pelvic fin rays | | | | | | | |
| ✓ Scales in lateral line | | 138-148 | 143.0 | | | | |
| ✓ Scales above lateral line | ✓ | ±40-45 | 42.5? | | | | |

see back -

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species *Salmo clarki pleuriticus*

Locality Colo, Hill Ck. 1/2 mi. ^{above} Fork White R. 10 mi. ^{above} from Buford } Rio Blanco Co.

Field No. 158434 Coll. by Preston & Dorothy Knioch

Date of Coll. 5-25-49 Measurements by Behrke Date 12-10-58

Jar No. _____ No. of Jars _____ No. of Spec. 2 Specimen No. _____

| | 1 | 2 | | | | |
|--|----------|--------------|--|--|--|--|
| Standard L | 213 | 180 | | | | |
| Body D | 51 | 46 | | | | |
| Head L | 54 | 49 | | | | |
| Head D | 36 | 32 | | | | |
| Head W | 30 | 25 | | | | |
| Least interorbital bony W | 16 | 13 | | | | |
| Occiput to snout tip | 37 | 33 | | | | |
| Snout L | 13 | 12 | | | | |
| Orbit L | 13 | 11 | | | | |
| Upper Jaw L | 33 | 28 | | | | |
| Dorsal origin to snout tip | 105 | 93 | | | | |
| Depressed dorsal to insertion of adipose | 38 | 35 | | | | |
| Dorsal origin to anal v | 75 | 63 | | | | |
| Dorsal fin basal L | 31 | 24 | | | | |
| Dorsal fin depressed L | 46 | 37 | | | | |
| Adipose fin depressed L | 17 | regenerated | | | | |
| Caudal peduncle D | 23 | 20 | | | | |
| Caudal peduncle L | 34 | 30 | | | | |
| Vertebrae | 61 | 62 | | | | |
| First arch gill rakers (upper) | 7 | 9 | | | | |
| (lower) | 12 | 13 | | | | |
| (total) | 19 | 22 | | | | |
| Basibranchial teeth | 13 | 17 | | | | |
| Branchiostegal rays (right) | 10 | 11 | | | | |
| (left) | 10 | 11 | | | | |
| Pectoral fin rays | 15 | 15 | | | | |
| Pelvic fin rays | 9 | 9 | | | | |
| Scales in lateral line | 148 | 138 | | | | |
| Scales above lateral line | aprx. 40 | 40-45 | | | | |
| | | aprx 190 | | | | |
| | | 2 rows above | | | | |
| | missing | | | | | |

these fish resemble hybrids collected in Pine Valley. - But both have numerous basibranchial teeth - scales above lat. line, & 9 pelvic -

- the lat. line scale count 138-148 is extremely high - more information is needed on these fish.

*1: Eagle R. - Gypsum Colo. - 606 (jaw toy) - ancient specimen

*2: Indiana U. Mus. # 8219 (label) Sweetwater L. Eagle Co. Colo.
(collected by Jordan, Evermann) 1889

*3-8: Ind. U. Mus. # 8224 - Canon Cr. Garfield Co. Colo. - Jordan - Evermann - 1889 (4 more too poor to use)
5-8

CHARACTER ANALYSIS SHEET

- Trappers Lake, Garfield Co. Colo. -

Page 1 of 2 pages.

Species Salmo clarki pleuriticus - Col Dead, Sci collection

Locality Spotting as in Yellowstone cutthroat - many gutted:

Field No. _____ Coll. by Trappers Lake fish more heavily spotted.

Date of Coll. _____ Measurements by R. J. Behrke Date 12-28-57

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

| | 1 (606) | 2 | 3 | 4 | 5 (630/4134) | 6 (4133/632) | 7 (4132/660) |
|--|-----------|-----|-----|-----|--------------|--------------|--------------|
| Standard L | 218 | 206 | 192 | 170 | 235 | 245 | 260 |
| Body D | 55 | | | | | | |
| Head L | 54 | 46 | | | | | |
| Head D | 37 | | | | | | |
| Head W | 24 | | | | | | |
| Least interorbital bony W | 15 | | | | | | |
| Occiput to snout tip | 36 | | | | | | |
| Snout L | 13 | | | | | | |
| Orbit L | 14 | | | | | | |
| Jaw L | 31 | 25 | | | | | |
| Dorsal origin to snout tip | 113 | | | | | | |
| Depressed dorsal to insertion of adipose | 37 | | | | | | |
| Dorsal origin to anal o. | 75 | | | | | | |
| Dorsal fin basal L | 30 | | | | | | |
| Dorsal fin depressed L | 47 | 43 | 40 | | | | |
| Adipose fin depressed L | 15 | | | | | | |
| Caudal peduncle D | 23 | | | | | | |
| Caudal peduncle L | 39 | | | | | | |
| Vertebrae | | | | | | | |
| First arch gill rakers (upper) | 10 | | | | | | |
| (lower) | 14 | | | | | | |
| (total) | 24 | | | | | | |
| Basibranchial teeth | none seen | | | | | | |
| Branchiostegal rays (right) | 9 | 10 | 10 | | | | |
| (left) | 9 | 11 | 10 | | | | |
| Pectoral fin rays | 14 | 14 | 14 | | | | |
| Pelvic fin rays | 9 | 9 | 9 | | | | |
| Scales in lateral line | 127 | 128 | 125 | | 129 | 120 | 127 |
| Scales above lateral line | 37 | 35 | 34? | | | | |

*8 (4131)
265mm
S.L.

Scale =
L. 2.1
126

gills removed

gills removed

pecto-median

Salmo irideus morpho *argentatus*

Bejkov, Fishs, Contrib. Canadian Biol. III (16) 12 of 5 part

388, 1927 - Athabasca R.

Jordan E-

Dif. in Spotting

& Scales - plevet, - mac.

^{Utah}
virginalis in Utah Lake have scale count
approaching *pleveticus* - & more hyoid teeth than
river *virginalis* (6-11) vs (1-9)
mean 9 mean 4

CHARACTER ANALYSIS SHEET

Page 1 of 1 pages.

Species Salmo clarki pleuriticus - Cal Acad. Sci collection

Locality _____

Field No. _____ Coll. by _____

Date of Coll. _____ Measurements by _____ Date 12-28-57

Jar No. _____ No. of Jars _____ No. of Spec. _____ Specimen No. _____

measurements in thousandths of standard length.

| | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|
| Standard L | 218 | 206 | 192 | 170 | 235 | 245 | 260 |
| Body D | 252 | | | | | | |
| Head L | 247 | 223 | | | | | |
| Head D | 169 | | | | | | |
| Head W | 110 | | | | | | |
| Least interorbital bony W | 69 | | | | | | |
| Occiput to snout tip | 165 | | | | | | |
| Snout L | 60 | | | | | | |
| Orbit L | 64 | | | | | | |
| Upper Jaw L | 142 | 121 | | | | | |
| Dorsal origin to snout tip | 518 | | | | | | |
| Depressed dorsal to insertion of adipose | 169 | | | | | | |
| Dorsal origin to anal o | 344 | | | | | | |
| Dorsal fin basal L | 137 | | | | | | |
| Dorsal fin depressed L | 215 | 209 | 208 | | | | |
| Adipose fin depressed L | 69 | | | | | | |
| Caudal peduncle D | 105 | | | | | | |
| Caudal peduncle L | 179 | | | | | | |
| Vertebrae | | | | | | | |
| First arch gill rakers (upper) | | | | | | | |
| (lower) | | | | | | | |
| (total) | | | | | | | |
| Basibranchial teeth | | | | | | | |
| Branchiostegal rays (right) | | | | | | | |
| (left) | | | | | | | |
| Pectoral fin rays | | | | | | | |
| Pelvic fin rays | | | | | | | |
| Scales in lateral line | | | | | | | |
| Scales above lateral line | | | | | | | |

CHARACTER ANALYSIS SHEET

SPECIES: Salmo clarki "pleiniticus"
 LOCALITY: Green River, Wyo. Sweetwater Co.
 FIELD NO. _____ COLLECTED BY: Kirschbaum, Gabel
 DATE OF COLLECTION: Sept. 6, 1962 MEASUREMENTS BY: Behrke DATE: 1-22-63
 JAR NO. _____ NO. OF JARS: _____ NO. OF SPECIMENS: 1 SPECIMEN NO. _____

| | | | | | |
|----------------------------------|-----|--|--|--|--|
| Standard L | 320 | | | | |
| Body D | | | | | |
| Head L | 81 | | | | |
| Least interorbital bony W | | | | | |
| Occiput to snout tip | | | | | |
| Snout L | | | | | |
| Orbit L | | | | | |
| Upper Jaw L | 45 | | | | |
| Dorsal origin to snout tip | 161 | | | | |
| Dorsal fin basal L | | | | | |
| Dorsal fin depressed L | 62 | | | | |
| Adipose fin depressed L | 27 | | | | |
| Caudal peduncle D | | | | | |
| Caudal peduncle L | | | | | |
| Vertebrae | | | | | |
| First arch gill rakers (upper) | 8 | | | | |
| (lower) | 12 | | | | |
| (TOTAL) | 20 | | | | |
| Branchiostegal rays (right) | 11 | | | | |
| (Left) | 12 | | | | |
| Pectoral fin rays | 15 | | | | |
| Pelvic fin rays | 9 | | | | |
| Scales in lateral line | | | | | |
| Scales above lateral line | 38 | | | | |
| Scales 2 rows above lateral line | 173 | | | | |
| Scales, adipose to lateral line | 26 | | | | |
| Pelvic caeca | | | | | |
| Basi-branchial teeth | 1 | | | | |

80250 Taken from Green River poisoning operations.

- large spotted form - looks more typical of
Yellowstone L. cutt - concentrated on peduncle
and behind dorsal fin - few spots anterior

80250
SPECIMEN NO.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Box 119, Worland, Wyoming 82401

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300



POSTAGE AND FEES PAID
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INT 415



AN EQUAL OPPORTUNITY EMPLOYER

November

Dr. Behnke
Dept. of Wildlife and Fisheries
Colorado State University
Ft. Collins, Colorado 80521

Coop Units

RM:RHH
1120



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

District Office
P. O. Box 119
Worland, Wyoming 82401

November 12, 1973

Dr. Behnke
Dept. of Wildlife and Fisheries
Colorado State University
Ft. Collins, Colorado 80521

Dear Dr. Behnke:

I understand much of your work has dealt with the "Yellowstone" Cutthroat. Several of our aquatic habitats in Worland District contain "pure" probably native, populations of this specie. Do you have available publications and/or technical bulletins, etc. which deal specifically with the Yellowstone and imply habitat management needs and considerations?

Thanks. We consider several of these small streams to be rather unique and especially susceptible to damage from potential land use conflicts.

Sincerely yours,

Robert H. Haburchak
Wildlife Management Biologist

vert.

| | | |
|----|----|----|
| 62 | 63 | 64 |
| 3 | 4 | 3 |

 $\bar{x} = 63$

gillraker $\bar{x} = 19.2$
vert. scale ct $\bar{x} = 42.9$
horiz scale ct $\bar{x} = 185.9$
caecal ct $\bar{x} = 39.8$
dentition $\bar{x} = 7$

The Native Cutthroat Trout of Wyoming
II: Further Evaluation of Collections from
the Green River and Bear River Drainages

Robert J. Behrke

Dept. Fishery and Wildlife Biology
Colorado State University

August, 1975

This report discussed all of the collections received ~~by~~ from the Wyoming Game and Fish Department to date in 1975, ~~which~~ consisting of 18 samples (16 Green River, 2 Bear R.) ^{with a total of} ~~and~~ 177 specimens.

The interpretation of the data from these samples is ^{somewhat} similar to the evaluation of the samples treated in Report I (July, 1975). Only upper Rock Creek specimens appear to be pure (all with basibranchial teeth and other characters typical of S. c. pleuriticus). Eight specimens collected ^{in 1974} from the North Fork of the Little Snake at the USGS Gauging Station have typical values of pleuriticus and ~~and~~ appear to represent a virtually pure population. However, two specimens collected by Binns and Oberholzer from the North Fork of the Little Snake in 1972 are the most obvious ♀ rainbow x cutthroat hybrids of all the specimens examined in this study. Unfortunately the label for these two specimens is faded and the precise locality ~~is~~ can't be made out. ^{Although the sample size is small} the striking difference in appearance and in

II(b)

the meristic characters between the two samples from the North Fork of the Little Snake is such that I believe some barriers, ~~or~~ either physical or biological, exists to prevent free interbreeding of the populations represented by these samples. The other samples from the Little Snake drainage are slightly hybridized, but are "good" phenotypic representatives of the native trout. That is, they have the typical spotting pattern of the native trout and the effects of rainbow trout hybridization can not be detected from superficial examination of the specimens.

As mentioned in the first report, the cutthroat trout native to the Little Snake drainage (Yampa River division of the Green R. basin) exhibit a decidedly different spotting pattern than the S. c. pleuriticus from the upper Green River basin (La Barge Creek, northwards). The Little Snake cutthroat trout have larger, more pronounced and more profuse spotting, although the meristic values appear to be essentially similar. There is an ontogenetic effect on spotting pattern, with a tendency for larger, older trout to develop relatively larger, more pronounced spots, and this may

be particularly true ⁱⁿ with the Bear River cutthroat (S. c. utah).

The only sample from the Black's Fork drainage of the Green R. (Horse Crk.) exhibits an intermediate spotting pattern between that of the Little Snake drainage and the upper Green R. area. The data provided by Bob Wiley ^{for} the Horse Creek sample states that no stocking records exist for this remote stream. The lack of basibranchial teeth in 40% of the specimens, however, denotes a rainbow trout influence in this population. Despite the high proportion of trout without basibranchial teeth, the other meristic values of the Horse Crk. specimens are close to S. c. pleuriticus and there ~~is~~ ^{is} no outward appearance of hybridization in any of the specimens. They can be considered as a "good" phenotypic representative of ^{the} S. c. pleuriticus native to the Black's Fork system.

Comparison of the two samples from Rock Creek (above and below a barrier) with each other and with a 1971 collection from Rock Creek is of interest. The ¹⁹⁷⁴ sample from above the barrier is almost identical to the 1971 sample except for fewer basibranchial teeth (4-14 [7.8] vs. 3-25 [13.8]). This ~~discrepancy~~ discrepancy might be due to

II(b)

sampling error, with the inclusion of a few specimens in the 1971 collection with exceedingly high tooth counts. The specimens from below the barrier have ~~identical~~ ^{similar} values to those from above the barrier but there is a noticeable difference in spotting pattern. Some of the specimens from below the barrier have larger, more erratic and asymmetrical spots. The suggestion is ^{that} hybridization may have occurred with non-native cutthroat trout such as Yellowstone and/or Snake River cutthroat.

Information, ^{kindly} provided by Dr. Allen Benins states that two barriers were installed in 1974 on Rock Creek. The question is: were the two populations sampled in Rock Creek in 1974 ~~g.~~ freely able to intermix before the barriers were installed? Is there a natural barrier on Rock Creek isolating the population sampled in 1971?

In general, the other samples from the upper Green River drainage appear to be "good" phenotypic representatives of the native trout with the exception of the obvious hybrid appearance of South La Barge Creek specimens. The South La Barge Cr. ~~trout~~ trout are ~~pred~~ probably a mixture of

the native cutthroat with a non-native cutthroat and rainbow trout. A specimen with erratic spotting was noted from the South Fork of North Horse Creek sample, ~~probably~~ ^{high proportion} Despite the ~~number~~ of specimens without basibranchial teeth in the Coal Creek and Red Castle Creek samples and the reduced number in the specimens with these teeth, both of these samples ^{essentially} possess the typical pleuriticus spotting pattern, but slightly erratic spotting was noted in some of the Coal Creek specimens.

Bear River Samples

The specimens from Raymond Creek, although probably slightly hybridized with rainbow trout, have the typical appearance of the native trout, Salmo clarki utah, with large, ^{pronounced} roundish spots, sparsely distributed on the sides of the body. Although 20% of the sample lacks basibranchial teeth, the other values are close to the expected for S. c. utah and the population in Raymond Creek may be ~~as~~ ²⁵ at ~~just~~ ^{good} about ~~the~~ ² ~~best~~ phenotypic approximation of the original Bear River cutthroat ²⁵ that can be expected.

The Huff Creek sample of 10 all have basibranchial teeth and the other meristic values do not indicate hybridization, but their spotting pattern is not as typical of

S. c. utah as ~~the~~ ^{Perhaps} Raymond Creek trout ~~and~~ the Huff Creek population has been influenced by introductions of Snake River cutthroat.

It should be pointed out that ~~many~~ of ~~the~~ ^{of several} specimens ~~are from~~ ^{of many} samples are badly faded and diagnosis of ~~the~~ ^{and} interpretation of ~~the~~ spotting pattern is difficult.

Thoughts on Native Trout Fisheries

Rob ~~It~~ ^{is} clear that if a rare trout ~~is~~ ^{is} to be restored to its native range in more than a token way, ~~that~~ ^{the native,} trout must possess some ~~of~~ traits of potential fisheries management value that more than offsets the ~~additional~~ costs of replacing non-native trout with native trout.

The most obvious advantage of emphasizing a management program for a rare, native trout is the leverage a state resource agency has to stimulate cooperation from federal agencies such as the U.S. Forest Service and the B.L.M. to improve a watershed and prevent further degradation from such impacts as grazing, logging, road building and mining, ~~except~~ ^{when} a restoration or enhancement project is

IV(a)

on federal lands.

A ^{truly} native trout fishery can also be ranked much higher ^{than a hatchery trout fishery} on a scale of values for cost-benefit analysis input for any potential ^{error} development alternatives. Hard, factual data is lacking on values for native trout fisheries, ~~but~~ and ~~these~~ figures may be open for different interpretations, but a Ph. D. thesis by Larry Marshall (1972. Poudre River fishery evaluation, C.S.U.), ~~did~~ determined that fishermen fishing for wild trout (self-reproducing populations of brown and rainbow trouts) placed a higher value (were willing to pay more) ~~on~~ ^{on} the opportunity to fish for wild trout than fishermen fishing for catchable hatchery trout ~~by~~ ^{80%} more). In a scale of ^{increasing} angling values, trout fishing ^{eries} might be ranked as follows: 1. catchable hatchery trout ^(lowest) ~~(lowest)~~ ^{2.} fisheries based on fry ^{or} fingerling plants (lakes) ^{3.} wild trout stream fisheries ^{4.} native trout fisheries.

~~Special regulation~~ Information and education programs can play a significant role influencing the values placed on a native trout fishery by the public. All of the psychological factors which may influence a person to choose a small

IV(b)

goblet of a premium vintage wine
~~over~~ a tankard of "vin ordinaire", are
analogous to ~~the~~ upgrading the values and
preference for a native trout fishery
over a hatchery trout fishery - quality
vs. quantity, and this is largely a
matter of public information and education.

~~There are~~ Special regulation fisheries
for native cutthroat trout have been, in
general, enthusiastically endorsed by anglers, in
Idaho and in Yellowstone Park.

The great vulnerability of cutthroat
trout to angling, also makes it the ideal
fish for special regulations (minimum
size, restricted kill or no kill) fisheries
where ~~the~~ a fish may be caught and
released several times in its lifetime.

If a brood stock propagation
program for S. c. pleuriticus (and S. c.
utah) could ~~be~~ produce large numbers
of fry, their ~~growth potential~~ longevity
and growth potential in cold waters
should be an advantage over rainbow
trout, ^{for stocking} in mountain lakes ^{lacking} ~~without~~ ~~are~~
areas for natural reproduction.

The Province of Alberta has a special
regulation for cutthroat trout in small streams,
~~by~~ These streams are closed on alternate years to
allow a build-up of catchable size fish.

(I) Table 1. Character analysis of collections of cutthroat trout from the Green and Bear River basins, Wyoming.

| Locality | Vertebrae | Gillrakers | Pyloric caeca | Scales above lat. line and lat. Series | Basibranchial teeth |
|--|-----------------|-----------------|-----------------|--|--------------------------------|
| N. Fork, N. Horse Crk. R115W, T34N. N=6 Miller and Klein 7:27:73 | 62 (>11) | 18-21 (19.5) | 33-45 (37.2) | 38-47 (42.7) 162-189 (179.3) | 0-8 (4.2) 1 of 6 w/o teeth |
| S. Fork, N. Horse Crk. R115W, T34N. N=7 Miller and Klein 7:27:73 | 62-63 (62.5) | 20-21 (20.3) | 35-47 (40.6) | 36-44 (41.9) 163-180 (173.4) | 0-12 (5.6) 1 of 7 w/o teeth |
| Nyländer Crk., trib. N. Cottonwood. R115W, T33N. N=3 Miller and Klein 7:24:73 | 62-63 (62.3) | 19-20 (19.7) | 36-43 (39.0) | 41-44 (43) 180-187 (183) | 2-8 (4.7) |
| Bare Crk., trib. S. Cottonwood. R115W, T32N. N=7 Miller and Klein 7:24:73 | 60-64 (62.4) | 17-21 (19.7) | 38-44 (39.7) | 38-44 (41.8) 170-183 (177.1) | 0-13 (6.4) 1 of 7 w/o teeth |
| Red Castle Crk., Trib S. Cottonwood. R114W, T32N, N=23 Dunning 8:2:73 | 60-63 (61.6) | 19-21 (20.0) | 37-52 (43.4) | 39-45 (42.9) 167-181 (174.0) | 0-3 (1.6) 5 of 15 w/o teeth |
| Coal Crk., trib. S. Cottonwood Piney. R115W, T30N. N=6 Klein 7:30:73 | 62-63 (62.6) | 19-22 (20.0) | 31-42 (36.3) | 39-46 (42.7) 171-183 (177.2) | 0-2 (0.7) 4 of 6 w/o teeth |

Stream Name: _____ Investigators Stork, E.F.

Location: _____ McInnis, M.A.

Fish Present Type Length Weight K-factor

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Habitat:

Bottom Type: _____

Insects:

Vegetation & Banks

Pool: Riffle Ratio: _____

Surrounding Environment:

Riffle

Pool

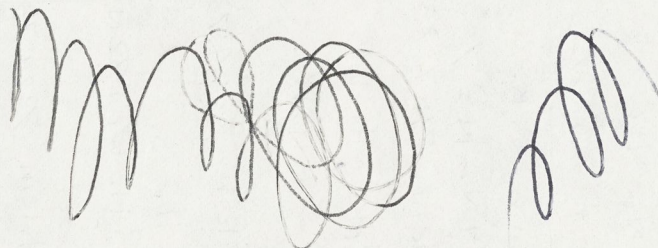
Mean Width

Mean Depth

Flow (CFS)

Mean Temp.

Comments



II

Table 1: cont.

| locality | Vertebrae | Gillrakers | Pyloric caeca | Scales above lat. line and lat. ser. | Basibranchial teeth |
|---|-----------------|-----------------|-----------------|--------------------------------------|--------------------------------|
| Rock Crk., trib. La Barge (above barrier) R114W, T27N. N=10 Miller, Klein 10:24:74 | 61-64 (62.1) | 18-21 (19.2) | 32-43 (37.4) | 40-48 (44.9) 173-202 (186.9) | 4-14 (7.8) |
| Rock Crk. (below barrier) R114W, T27N. N=10 Miller, Klein 10:24:74 | 61-64 (62.2) | 17-20 (18.6) | 33-41 (37.0) | 40-46 (43.0) 177-194 (184.6) | 2-11 (6.0) |
| S. La Barge Crk. R116W, T28N N=6 Miller, Klein 7:31:73 | 61-64 (62.7) | 16-21 (18.8) | 32-44 (37.5) | 37-45 (41.3) 169-191 (180.7) | 0-13 (8.3) 1 of 6 w/o teeth |
| Horse Crk., trib. Blacks Fk., near Robertson, Wyo. Blvd. fm. Wiley, 1975 N=30 | 60-64 (61.3) | 17-20 (18.8) | 33-43 (37.7) | 38-45 (40.9) 167-188 (176.6) | 0-9 (2.9) 6 of 15 w/o teeth |
| Little Snake Drainage | | | | | |
| N. Fk. Little Snake N=2 Binns, Oberholzer 8:31:72 | 62, 63 | 17, 19 | decomposed | 33, 39 152, 167 | 0 both w/o teeth |
| N. Fk. Little Snake at USGS ^{Gage} Sta, R. 85W, T12N N=8 Binns, Oberholzer 9:4:74 | 60-62 (61.3) | 18-22 (19.4) | 32-40 (34.4) | 39-44 (41.9) 175-188 (180.9) | 1-13 (6.0) |
| Big Sandstone Crk, above Douglas Crk. N=4 Binns 9:13:74 | 60-62 (61.0) | 20-22 (20.8) | 34-42 (38.8) | 37-43 (41.0) 161-185 (175.5) | 0-9 (2.8) 2 of 4 w/o teeth |

Stream Name: _____ Investigators Stork, E.F.

Location: _____ McInnis, M.A.

| <u>Fish Present</u> | <u>Type</u> | <u>Length</u> | <u>Weight</u> | <u>K-factor</u> |
|---------------------|-------------|---------------|---------------|-----------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |

Habitat:

Bottom Type: _____

Insects:

Vegetation & Banks

Pool: Riffle Ratio: _____

Surrounding Environment:

| | <u>Riffle</u> | <u>Pool</u> |
|------------|---------------|-------------|
| Mean Width | | |
| Mean Depth | | |
| Flow (CFS) | | |
| Mean Temp. | | |
| Comments | | |

Table 1 cont.

| locality | Vertebrae | Gillrakers | Pyloric caeca | Scales above 1st line and 1st ser. | Basibranchial teeth |
|---|-----------------|-----------------|-----------------|--|---------------------------------|
| W. Br. N. 7K. Crk. R 86W, T 12N. N=5 Binns, Oberholzer 8:72 | 60-62 (61.4) | 18-20 (18.8) | decomposed | 39-44 (42.1) 164-187 (175.6) | 0-7 (3.6) 2 of 5 w/o teeth |
| Deadman Crk. R 85W, T 12N N=9 Binns, Oberholzer 9:4:74 | 61-62 (61.7) | 17-20 (18.3) | 35-44 (39.4) | 38-43 (40.3) 167-180 (173.9) | 0-9 (2.4) 2 of 7 w/o teeth |
| Harrison Crk. R 85W, T 13N. N=8 Binns Oberholzer 9:4:74 | 61-63 (62.0) | 18-22 (20.1) | 29-49 (39.3) | 38-44 (40.8) 166-187 (176.4) | 0-11 (2.7) 3 of 7 w/o teeth |
| Bear R. Drainage | | | | | |
| Raymond Crk. R 119W, T 27N N=24 Miller, Smith 11:6:74 | 62-64 (63.0) | 16-19 (17.1) | 39-51 (45.1) | 34-40 (36.1) 159-173 (164.4) | 0-14 (7.1) 4 of 20 w/o teeth |
| Huff Crk. R 119W, T 27N N=10 Miller 11:7:74 | 61-63 (62.1) | 18-20 (19.1) | 38-50 (42.8) | 33-42 (38.3) 156-171 (162.7) | 1-7 (4.1) |

Stream Name: _____ Investigators Stork, E.F.

Location: _____ McInnis, M.A.

| <u>Fish Present</u> | <u>Type</u> | <u>Length</u> | <u>Weight</u> | <u>K-factor</u> |
|---------------------|-------------|---------------|---------------|-----------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |

Habitat:

Bottom Type: _____

Insects:

Vegetation & Banks

Pool: Riffle Ratio: _____

Surrounding Environment:

| | <u>Riffle</u> | <u>Pool</u> |
|------------|---------------|-------------|
| Mean Width | | |
| Mean Depth | | |
| Flow (CFS) | | |
| Mean Temp. | | |
| Comments | | |

Footes

Gambusia - lvs

Scales range - 35

D 7 A 6 no apparent

fins rounded no barbel

| | razers | scales | excess | teeth | vert. |
|----------------------------|--------|----------------------|--------|---------------------|---------------|
| S Fk. N. Horse Crk. N=7 | 20.3 | $\frac{40.6}{173.4}$ | 40.6 | 0-12 5.6 10/0 | 62-63 62.6 |

| | | | | | |
|------------------------|----------------------|--------------------|------|--------------------|---------------|
| Big Sandstone Crk. N=4 | $\frac{20.22}{20.8}$ | $\frac{40}{175.5}$ | 38.8 | 0-9 2.8 20/0 | 60-61 60.8 |
|------------------------|----------------------|--------------------|------|--------------------|---------------|

| | | | | | |
|-------------------|------|--------------------|--|------------------------|------|
| W. Br. N. Fk. N=5 | 18.8 | $\frac{42}{175.6}$ | | 0-7 3.0 2 4/0 | 61.4 |
|-------------------|------|--------------------|--|------------------------|------|

| | | | | | |
|--------------------------------|------|----------------------|------|-------------|------|
| N Fk. Little Snake N=7 | 19.4 | $\frac{40.1}{180.8}$ | 34.4 | 1-13 6.0 | 61.3 |
| 2 fm N. Fk. - obvious hybrids. | | | | * 2/1 | |

| | | | | | |
|------------------|------|----------------------|------|--------------------|------|
| Deadman Crk. N=7 | 18.3 | $\frac{40.3}{173.9}$ | 38.4 | 0-9 2.4 20/0 | 61.7 |
|------------------|------|----------------------|------|--------------------|------|

| | | | | | |
|------------------------|------|----------------------|------|----------------------|---------------|
| Rock Crk. - above N=10 | 19.2 | $\frac{42.9}{185.9}$ | 39.8 | 5-14 (7) * 2/1 | 62-64 63.0 |
|------------------------|------|----------------------|------|----------------------|---------------|

| | | | | | |
|----------------------------|------|----------------------|------|---------------------|------|
| Huff Crk - Bear R. N=10 | 19.1 | $\frac{40.3}{174.2}$ | 42.8 | 1-7 4.1 * 2/1 | 62.1 |
|----------------------------|------|----------------------|------|---------------------|------|

| | | | | | |
|----------------------------------|------|----------------------|------|---------------------------------------|------|
| Raymond Crk - Bear N=10 18 | 17.1 | $\frac{35.1}{178.4}$ | 45.1 | 10-21 + 2/0 20/0 4-14 7.1 | 63.0 |
|----------------------------------|------|----------------------|------|---------------------------------------|------|

Harrison - Trib Little Snake - 3 of 7 of 6 + 23

| | |
|--------------------|---------|
| Bate | 1 of 7 |
| Coz | 4 of 6 |
| Reel Castle | 3 of 9 |
| N. N. Horse | 1 of 6 |
| S. La Berge | 1 of 6 |
| Mylander | 2 of 3 |
| Rock below barrier | 2 of 8 |
| Horse Crk. | 4 of 10 |

X-ray -

Giraffe?
Archib.
Salt.

- what +
he
dise

- look up Rock
N. Basin -

Wyoming Trout

Trout

Nylander Creek (North Cottonwood) 3

South La Barge Creek 6

Coal Creek (S. Piney) 6

North Fork of North Horse Creek 6

Huff Creek (Bear River) 10

? - Deadman Creek - Little Snake 7

Raymond Creek (Bear River) 24

? - Harrison Creek - N. Fork Little Snake 8

North Fork of Little Snake River - obvious hybrids 2

2 coll - Rock Creek (La Barge Creek) 11

Horse Creek 30

Big Sandstone Creek 4

North Fork of Little Snake River @ USGS 8

Red Castle Creek 23

South Fork of North Horse Creek 7

Bare Creek (South Cottonwood Cr.) 7

? - West Branch of North Fork Creek - Little Snake 5

+ Rock Crk 10

Total 167

E Fork Wind R. + 10

9

$$\begin{array}{c|c|c|c|c} 60 & 61 & 62 & 63 & 64 \\ \hline 1 & 1 & 0 & 2 & 1 \end{array} \quad \bar{x} = 62.4$$

gillraker ct $\bar{x} = 19.7$
vert. scale ct $\bar{x} = 40.57$
horiz. scale ct $\bar{x} = 180.14$
caecal ct $\bar{x} = 39.71$
dentition $\bar{x} = 6.43$

vert. 62-6 $\bar{x} = 62$

gillraker ct. $\bar{x} = 20.14$

vert. scale ct. $\bar{x} = 40.5$

horiz scale ct. $\bar{x} = 185.4$

caecal ct. $\bar{x} = 38$

dentition $\bar{x} = 2.7$

vert. 62 - 6 $\bar{x} = 62$

gillraker ct. $\bar{x} = 19.5$

vert scale ct $\bar{x} = 41.67$

horiz scale ct $\bar{x} = 189.33$

caecal ct $\bar{x} = 37.17$

dentition $\bar{x} = 4.17$

| | | | | | | |
|-------|----|----|----|----|----|------|
| vert. | 61 | 62 | 63 | 64 | 65 | |
| | 1 | 0 | 3 | 1 | 1 | 63.2 |

gillraker $\bar{x} = 18.83$

vert. scale $\bar{x} = 42.33$

horiz. scale $\bar{x} = 190.67$

caecal $\bar{x} = 35.5$

dentition $\bar{x} = 8.33$

vert $\frac{62}{1} \mid \frac{63}{2}$ $\bar{x} = 62.67$

gillraker ct $\bar{x} = 19.33$
vert. scale ct. $\bar{x} = 42$
horiz. scale ct. $\bar{x} = 189.33$
caecal ct $\bar{x} = 39$
dentition $\bar{x} = 4.67$

Jim:

I haven't heard from Wyoming, but it matters little as far as you are concerned. I told Sharon to keep you on the Nat. Park fund for July & August (and you don't have to worry about writing a report).

The most important collections I want accurate data on are the recent samples from Trout Creek Utah and the box on desk from Washington. The Washington fish are a brood stock used in propagation. Reputedly they came from Lake Chelan originally. L. Chelan is in Columbia R. but in western Washington. These specimens look like westslope cutts - how did they get to L. Chelan??

2ything
else which
may come
in this
summer.

Finish up all other uncompleted samples - Green R. - Colo. R., golden trout fm. Montana (may be some Bonnerville sent by Mullan and/or Smith?) Also all the samples of Norwegian Salvelinus (the scale counts will be difficult but not impossible - c. 200-220)

I told Ed & Ted that when the shelves are taken out of collection room to see if they might be set up in 302 to make room to move around.

The rest of time can be put in on cleaning the bottles, filling with alcohol, and if time allows, make inventory - a list of just what we have - Some of old bottles have ethyl alcohol

- it smells different, usually has a yellowish color and we once put different colored plastic pieces ~~in~~ each bottle to signify ethyl or isopropyl
 yellow? - blue?

The bottle of miscellaneous fish on desk is ethyl. - ~~Such~~ This collection can be put in quart bottle w/ isopropyl and the ethyl used to fill another ethyl bottle. We have no more ethyl alcohol so bottles are combined to fill one and isopropyl used to fill the other.

Keep all data sheets in the drawer so I can find them.

When you finish up, return scope to Dr. Pettis.

I'll probably leave my keys to the Zool. Bldg. with my wife to give to you to return to Pat the secretary.

My family plans to leave for California on Wed. July 10.

* We need new gallon bottles. Get in touch with the food services at one of the dorms (Vicky is working at a dorm I believe), and request they save several dozen gallon bottles - see if you can find a place to store them in 302.

My address is:

Dept. Environmental Conservation

P.O. Box 1430

Tehran, Iran

- Good luck & best regards

vert. $\frac{62}{3} \mid \frac{63}{4}$

$n=7$

$\bar{x} = 62.57$

gillraker $\bar{x} = 20.29$

horiz. scale ct $\bar{x} = 173.43$

vert. scale ct $\bar{x} = 40.7$

caecal ct $\bar{x} = 40.57$

dentition $\bar{x} = 5.57$

$$\text{vent. } \frac{62}{2} \cdot \frac{63}{4} \bar{x} = 62.67$$

$$\text{gillraker ct } \bar{x} = 20$$

$$\text{horiz. scale ct } \bar{x} = 177.17$$

$$\text{vent. scale ct } \bar{x} = 42.67$$

$$\text{caecal ct } \bar{x} = 35$$

$$\text{dentition } \bar{x} = .67$$

| | | | | | | |
|--------|----|----|----|----|----|-----------------|
| .Vert. | 60 | 61 | 62 | 63 | 64 | |
| | 4 | 4 | 6 | 0 | 1 | 61.3 |
| | 12 | | 10 | | 15 | $\frac{6}{100}$ |

gillraker $\bar{x} = 18.8$

vert scale ct $\bar{x} = 40.9$

horiz scale ct $\bar{x} = 186.6$

caecal ct $\bar{x} = 37.7$

dentition $\bar{x} = 2.9$

vert.

| | |
|----|----|
| 61 | 62 |
| 1 | 1 |

 $\bar{x} = 61.5$

gillraker $\bar{x} = 18$

vert. scale et $\bar{x} = 36$

horiz. scale et $\bar{x} = 159.5$

caecal $\bar{x} = 0$ not countable

dentition $\bar{x} = 0$

vert. $\begin{array}{r|l} 61 & 62 \\ \hline 2 & 4 \end{array} \quad \bar{x} = 61.67$

Gillnetter $\bar{x} = 18.285$
vert. scale ct. $\bar{x} = 40.285$
horiz. scale ct. $\bar{x} = 173.86$
caecal ct. $\bar{x} = 38.43$
dentition $\bar{x} = 2.43$

vert.

| | | |
|-----|-----|-----|
| .60 | .61 | .62 |
| 1 | 3 | 3 |

$$\bar{x} = 61.285$$

$$\text{gillraker } \bar{x} = 19.43$$

$$\text{vert. scale ct. } \bar{x} = 40.14$$

$$\text{horiz. scale ct. } \bar{x} = 180.86$$

$$\text{caecal ct. } \bar{x} = 34.43$$

$$\text{dentition } \bar{x} = 6$$

vert.

| | | |
|----|----|----|
| 60 | 61 | 62 |
| 1 | 1 | 3 |

 $\bar{x} = 61.4$

gillraker $\bar{x} = 18.8$
horiz. scale ct $\bar{x} = 175.6$
vert. scale ct $\bar{x} = 42$
caecal ct $\bar{x} = \text{not countable}$
dentition $\bar{x} = 3$

vert. $\begin{array}{r|l} 60 & 61 \\ \hline 1 & 3 \end{array} \quad \bar{x} = 60.75$

gillraker $\bar{x} = 20.75$

horiz scale ct $\bar{x} = 175.5$

vert scale ct $\bar{x} = 40$

Caecal ct $\bar{x} = 38.75$

dentition $\bar{x} = 2.75$

The Native Cutthroat Trout of Wyoming. I: Evaluation of Collections from the Green River and Bear River Drainages

Wyo. ~~St. Albans~~ ~~big spot.~~ ~~Valley Fork~~ ~~Robert S. Behnke~~ ~~Dept. Fishery and Wildlife Biology~~ ~~Colorado State University~~ ~~July, 1975.~~

Robert S. Behnke
 Dept. Fishery and Wildlife Biology
 Colorado State University
 July, 1975.

Drainages: Tongue, Powder, Belle Fourche, Cheyenne, South Platte, Sweetwater

The state of Wyoming originally possessed more subspecies (5) of cutthroat trout than any other state. The most abundant and flourishing of these, the fine-spotted cutthroat trout native to the Snake River in the Jackson Hole area is, as yet, undescribed. The greenback cutthroat trout, S. c. stomias, native to the South Platte River basin, had the most restricted distribution in the state, being limited to a few ^{small} headwater streams south of Laramie and Cheyenne. This subspecies is now extinct in Wyoming but a possibility exists to re-introduce it from stocks in Colorado. ^{The Bear River drainage of the Bonneville basin is} wedged between the Snake River drainage to the north and the Green River system to the south on the Idaho-Utah border. The native trout of this basin, S. c. utah, once inhabited all of the Bear River system in Wyoming. Examination of several ^{authentic etc} collections in recent years has failed to reveal a pure population of this trout in Wyoming. All collections have not yet been completely examined, however, and some ~~of~~ populations are only slightly hybridized so ~~the~~ the original characteristics of the Bear River cutthroat can be established.

In the headwaters of the Snake River, above Jackson Lake, and in tributaries below Jackson Lake (Pacific Creek, Spread Cr.), another form of cutthroat trout exists. This trout is readily distinguished from the fine-spotted Snake River cutthroat by ~~larger~~ larger, fewer, larger, and round shaped spots. The ~~a~~ most ^{intriguing} intriguing aspect

S.P. 715
 V.S.P. 2
 1973

II(b)

of the existence of two ~~of~~ distinct groups of cutthroat trout in the upper Snake River of Wyoming is that they maintain their identity (essentially are reproductively isolated) despite the absence of barriers on the Spread Creek and Pacific Creek to prevent mixing of the two forms. I have never encountered a natural situation where the two both the large-spotted and fine-spotted cutthroat trout live together - ^{but} ~~either~~ ~~one~~ ~~or~~ ~~the~~ ~~other~~ how do they know the boundaries beyond which they do not trespass ~~and~~ and enter each others territory?

The large-spotted Snake River cutthroat gave rise to ~~the~~ all the cutthroat trout in the Yellowstone drainage, probably not more than 8,000 years ago, and the Yellowstone cutthroat and large-spotted Snake River cutthroat can be considered as a single subspecies. The Yellowstone cutthroat has been commonly classified as Salmo clarki lewisi, but this name belongs to the cutthroat trout of the upper Missouri basin in Montana, which is a distinctly different trout and derived from a separate transgression of the Continental Divide from the headwaters of the Columbia River system. The correct scientific name for the Yellowstone ^{trout} ~~and~~ ^{that of the} large-spotted Snake River trout) ~~is~~ is not certain. Undoubtedly the large-spotted Snake River trout also gave rise to the trout of the Bonneville basin (S. c. utah) ^{prior to the invasion of the Yellowstone drainage} and is ^{some} quite similar to ~~the~~ ^{S. c. utah} ~~Bonneville~~. If ~~not~~ considered ~~as~~ the same subspecies as ~~the~~ Thus, it ^{is} can be debatable if the

Yellowstone and large-spotted Snake River cutthroat trout should^{als} be classified as S. c. utah or not. Because of the geographical regions involved and to emphasize the evolutionary and geographic separation, it ~~can~~^{may} be more convenient to recognize a separate subspecies for the large-spotted cutthroat trout of the Snake River and Yellowstone basins. The oldest available name for this trout appears to be Salmo clarki boveri^{vieri}, described from Waha Lake, Idaho (a tributary to the Snake R.), in 1883.

As mentioned above, S. c. lewisi, is the correct name for the native cutthroat trout of the upper Missouri (and also much of upper Columbia) basin. ^{In Wyoming,} S. c. lewisi was restricted to a small area in the headwaters of the Madison and Gallatin rivers in Yellowstone Park. Pure populations are virtually extinct in Wyoming. Evidently, inhospitable habitat acted to prevent any intermixing of the cutthroat trout of the upper Missouri and Yellowstone rivers. If trout ever existed as far down^{stream} as the junction of the Yellowstone and Missouri rivers, ~~trout~~^{they should} ~~would~~^{persisted} have ~~been~~^{been} native to ~~the~~ the Tongue, Powder and Belle Fourche drainages - all barren of trout before introductions by man. Also the Cheyenne and North Platte-Sweetwater drainages were ^{originally} barren of trout.

The fifth subspecies of cutthroat trout native to Wyoming is the Colorado or Green River cutthroat, S. c. pleuriticus, a beautifully colored trout, ~~now existing~~ once the only trout throughout the whole Green River basin, now restricted as pure populations to a few

small streams, but an active restoration effort by the Wyoming Game and Fish Department offers a brighter future for this rare trout.

Prote
1. Swan
Preservation and Restoration of Rare Trout

The first step in a program to protect and restore rare trout concerns surveys and identification. That is, to find the particular trout ^{in question} and be able to recognize it when it is found. During this aspect of a program, suitable sites for potential re-introductions of pure populations can be noted.

Because there is broad overlap in the ^{taxonomic} characters of the various subspecies of cutthroat trout, ^{question on} the validity of certain subspecies names may be raised. For ^{practical} management purposes, ~~it is taxonomic~~ ^{it is advisable} to avoid questions of scientific nomenclature and to consider a native trout of any area as evolutionary realities - the aboriginal trout indigenous to a particular geographical area or drainage basins and a part of our biological heritage which should be preserved.

insert
I

When sufficient collections have been made and the diagnostic criteria for ~~the~~ a subspecies established, evaluations of the relative purity of the samples from several populations can begin.

Those populations judged to be ^{pure} pure (uncontaminated by hybridization with rainbow trout or other subspecies of cutthroat trout), ^{or virtually pure,} can then be granted special recognition in

Insert I
p. IIb

Despite ^{some} taxonomic uncertainty, all of the native cutthroat trout of Wyoming ~~are~~ are within the definitions set forth in the 1973 Endangered Species Act (P.L. 93-205), where a species is defined to include: "subspecies, smaller taxa or any viable population segment thereof" ~~and~~ thus, all Wyoming native cutthroat trout ~~are~~ ^{can be considered} within the province of this law.

N. B. ...
Rock

regards to land use policy and can serve as a source for re-introductions.

Diagnosis Taxonomy of Recent Wyoming Collections:

1. Green River Basin (Salmo clarki pleuriticus). ~~†~~

~~Previously, I recognized two populations~~
 Previous work allowed for a diagnosis of the taxon native Green River cutthroat as follows: Bore A genetic basis to express bright coloration, especially red on sides and ventral surface. Spotting pattern variable but consistent within a geographical area - smaller, round spots in northern tributaries (La Barge Crk. northward), large, round spots (h. as large or larger than pupil of eye ~~and~~ ^{similar} virtually identical to greenback cutthroat spots) in the native cutthroat of the Little Snake drainage. Blacks Fork drainage trout with intermediate sized spots. Scales small, pure populations expected to have mean values of about 150 or more in the lateral series and 43 or more above the lateral line.

Mean Expected mean values for vertebral counts of pure populations 61-62. Basibranchial teeth present, variable in number. Some pure populations, particularly small, isolated ~~of~~ stocks may naturally lack basibranchial teeth in ~~a certain proportion~~ ^{some specimens} but if more than about 10% of a sample lack basibranchial teeth, the most likely

IV a
~~IV a~~

to increase ~~the~~ the number of vertebrae and decrease ~~the~~ the number of scales from hybrid influence. I stress again, however, that the overall effect of ~~the~~ hybrid influence is slight and virtually undetectable from superficial examination in all of the samples. Even ~~in~~ the specimens from the North Fork Muddy Creek, ⁱⁿ which 11 of 15 ^{fish} lack basibranchial teeth, ^{exhibit} ~~the~~ consistently ~~a~~ typical spotting pattern of S. c. pleuriticus. My recommendations for these 18 populations are similar to ~~former~~ suggestions based on samples from Douglas Creek, Wyoming and the Little West Fork of the Black Fork, Utah, that ~~we~~ are dealing with populations of native trout exposed to hybridization but which have maintained the integrity of their gene pools with very little alteration and are good (not pure) representatives of S. c. pleuriticus. As such they deserve special recognition in all land-use matters and management decisions that may threaten their perpetuation on one hand or enhance it on the other.

^{valid and significant}
Any implication can be drawn from this study concerning the practical value for fisheries management of ~~to~~ some of these populations of Green River cutthroat trout. The fact that all of these populations ~~have been~~ are under

IV b

natural selection, ~~there~~ ^{with} ~~and~~ ^{some} existing ⁱⁿ ~~under~~
~~so~~ severe or submarginal trout habitat
and although exposed to hybridization
with introduced trouts, they have effectively
resisted genetic swamping and replacement
of the native genotype as is so typical
of the pattern ~~of~~ cutthroat trout extinction
throughout the west. The only explanation
for this fact is that these native genotypes
^{must} ~~are~~ ^{be} far superior to the introduced rainbow
trout (or other subspecies of cutthroat trout) in
the particular environments in which they live -
it appears that ~~most~~ ~~populations~~ of the
Green River cutthroat is a hardy and
adaptable fish, at least in small stream
situations.

Three samples from the Little Snake
drainage may possibly represent pure populations
but more specimens should be examined, ~~the~~ ^{Trout}
from ^{the} headwaters of Big Sandstone Creek (N=7), Ted
Creek (N=6) and Solomon Creek (N=9). all have
basibranchial teeth and their other characters
are typical of S. c. pleuriticus. It is
doubtful, however, that strictly pure populations
of Green River cutthroat trout exist unless
there is some barrier which completely
prevents immigration from other parts of
the watershed, and no ^{introductions} ~~stocking~~ have
occurred above ^{such} ~~this~~ barriers.

V^a

As mentioned above, ~~the~~ S. c. pleuriticus from the Little Snake drainage have decidedly markedly larger spots than the pleuriticus from the upper Green River basin. This local differentiation can be explained by the disjunct areas inhabited by native trout in the Green and Colorado river basins. Originally, ^{suitable} trout environment suited for trout did not exist in the main Green River below the town of Green River and inter-mixing of the stocks between major tributaries such as upper Green River area, Yampa, White, Gunnison and Colorado rivers was probably non-existent ^{and} which allowed local differentiation in isolation could evolve.

2. Bonneville Basin (Bear River drainage)

2. Bear River Drainage of Bonneville Basin
(Salmo clarki utah).

Based on several years of collections, there is ~~no~~ ^{little} doubt that the Bonneville cutthroat trout is virtually extinct ~~in~~ pure populations. Only a few populations are known and all of these are isolated in small, headwater streams. The S. c. utah, is differentiated from S. c. pleuriticus by typically possessing fewer, but larger spots which are more evenly

V b.

distributed over the body (mainly concentrated on caudal peduncle area in pleuriticus). Also, the Bonneville cutthroat does not develop the ^{strikingly} bright coloration of pleuriticus and there is a common tendency for the cutthroat mark to be orange instead of red.

The meristic character which most readily separates pure populations of S. c. utah ^{from} S. c. pleuriticus is the number of scales. S. c. utah typically has 15-30 fewer scales in the lateral series (mean values of about 155-165).

No sample of trout from the Bear River drainage has been ^{yet previously} judged to represent a pure population of S. c. utah. Seven specimens from the headwaters of the Thomas Fork in the University of Wyoming's collection exhibit no indication of hybridization, but as with pleuriticus, it is doubtful that pure populations of utah exist without complete isolation from invasion and introductions.

The diagnosis for S. c. utah is based on ¹27 museum specimens collected from 1872 to 1915 and ^{three} ~~two~~ existing pure populations in Water Canyon and Reservoir Canyon creeks north of Pine Valley, Utah and in Birch Creek near

Insert →

To: Utah

- c. h. d. s. s. utah
- Bon

VIa

Brewer, Utah. However, what was said about S. c. pleuriticus, concerning local isolation of stocks and potential intra-subspecific differentiation, is particularly true with S. c. utah. With the rapid desiccation of Lake Bonneville about 8000 years ago, the tributaries to the pluvial lake (Sevier, Jordan, Provo, ~~Wasatch~~ and Bear rivers) became isolated from each other. Thus, present native trout populations of the Bonneville basin, isolated from each other for thousands of years, should not be expected to be identical in all characters, but they are expected to share a high degree of basic similarities, which will allow the detection of ^{the effects of} hybridization with rainbow trout.

IVb

Both the Giraffe Creek and Salt Creek samples exhibit the internal effects of slight hybridization with rainbow trout. About 15% of both samples lack basibranchial teeth and the pyloric caecal number is higher than expected. Hybrid influence is not apparant in the external appearance of the specimens, however, and both samples can be considered as "good" (not pure) representatives of Bonneville Basin Bonneville cutthroat trout.

VICb)

Because of massive introductions of rainbow trout and Snake River cutthroat trout in the Bear River drainage of Wyoming, and because of habitat loss and degradation, "good" representative populations of the original genotype are rare and deserving of special recognition.

- Tables - 122

Use
attached
ex. as guide

Table 1. Character analysis of collections of cutthroat trout from the Green River basin, Wyoming.

| Locality | Vertebrae | Gillrakers | Pyloric caeca | Scales above lat. line and lat. ser. | Basibranchial teeth |
|--|-----------------|-----------------|-----------------|--------------------------------------|--|
| S. Horse Crk. trib. (Horse Crk. drainage) Sublette Co., above For. Ser. boundary R 114 W, T 34 N N = 15 | 61-63 (62.3) | 16-22 (19.3) | 33-46 (39.9) | 41-46 (44.1) 155-193 (174.1) | 0-11 (4.3) 3 of 10 w/o teeth ^① |
| S. Horse Crk. below For. Ser. boundary N = 11 | 61-63 (62.3) | 19-22 (20.1) | 31-47 (39.2) | 39-50 (45.2) 161-192 (172.4) | 0-13 (4.2) 2 of 11 w/o teeth |
| Macki Crk. (Cottonwood Crk. trib.) Sublette Co., R 114 W, T 29 N N = 9 | 61-64 (62.5) | 18-23 (20.2) | 33-48 (40.9) | 39-49 (43.2) 146-183 (167.6) | 0-9 (7.8) 1 of 9 w/o teeth |
| N. Fork Muddy Crk. (Muddy Crk. trib.) Sublette Co., R 114 W, T 31 N N = 29 | 60-62 (61.7) | 19-21 (20.1) | 31-43 (38.1) | 39-44 (42.5) 162-187 (174.3) | 0-5 (0.6) 11 of 15 w/o teeth |
| Spring Crk. (Piney Crk. trib.) Sublette Co. R 114 W, T 29 N N = 14 | 62-63 (62.7) | 18-22 (19.6) | 31-50 (37.4) | 40-45 (42.2) 164-190 (171.9) | 0-13 (5.6) 2 of 11 w/o teeth |
| Trail Ridge Crk. (Piney Crk. trib.) Sublette Co. R 114 W, T 29 N N = 25 | 61-63 (62.2) | 14-22 (19.3) | 31-44 (37.1) | 40-45 (41.4) 165-180 (171.9) | 0-15 (3.8) 3 of 15 w/o teeth |

② (cont'd)

Blacks 7k. Drainage
W. 7k. Muddy Crk.
Uinta Co.
R118W, T18N
N=24

60-63
(61.8)

17-20
(18.3)

28-38
(34.8)

40-47 (42.7)
163-182 (173.8)

0-25 (4.1)
3 of 16 $\frac{1}{2}$ teeth

Van Tassel Crk.
(trib. W. 7k. Muddy)
R118W, T12N
N=35

61-63
(62.6)

14-19
(17.5)

31-41
(35.7)

39-45 (43.0)
166-188 (176.8)

0-10 (3.2)
3 of 10 $\frac{1}{2}$ teeth

E. 7k. Muddy Crk.
Uinta Co.
R117W, T13N
N=7

62-63
(62.1)

~~16-20~~
17-19
(18.3)

~~34-46~~
33-40
(40.5) (37.9)

42-48 (~~44.0~~^{43.9})
177-195 (183.7)

~~0-4 (1.7)~~
1-5 (3.1)
4 of

Beaver Dam Hollow
(trib. E. 7k. Muddy)
R117W, T12N
N=21

61-63
(62.1)

16-20
(18.0)

34-46
(40.5)

42-49 (~~44.0~~⁴⁴)
172-191 (180.2)

0-4 (1.7)
4 of 15 $\frac{1}{2}$ teeth

Muddy Crk.
Uinta Co.
R118W, T13N
N=3

61-63
(62.0)

16-19
(17.0)

36-39
(38.0)

42-48 (44.3)
165-182 (173.3)

7-8 (7.3)

Gilbert Crk.
(E. 7k. Smith 7k. trib.)
Uinta Co.
R115W, T12N
N=9

60-63 (~~61.8~~⁶)

~~14-22~~
17-20
(19.0)

33-46
(38.7)

43-46 (44.7)
172-196 (181.7)

0-2 (0.6)
6 of 9 $\frac{1}{2}$ teeth

Archie Crk.
(W. 7k. Smith 7k. trib.)
Uinta Co. Wyo.,
Summit Co. Utah
N=16

60-63 (61.8)

14-22
(19.5)

31-46
(39.4)

40-46 (42.4)
158-187 (175.9)

0-11 (4.5)
2 of 16 $\frac{1}{2}$ teeth

Little Snake Drainage

| | | | | | |
|--|-----------------|-----------------|-----------------|---------------------------------|--------------------------------|
| Douglas Crk, (Big Sandstone trib.) Carbon Co. N=17 | 61-63 (62.0) | 18-21 (19.4) | 31-42 (37.1) | 38-44 (41.4) 159-197 (178.6) | 0-13 (5.5) 3 of 17 w/ teeth |
| Headwaters Big Sandstone Crk. Carbon Co. N=7 | 60-62 (61.1) | 18-21 (19.0) | decomposed | 43-46 (44.5) 174-191 (183.2) | 3-12 (8.8) |
| N. 7K. Little Snake Carbon Co. R85W, T13N N=4 | 61-62 (61.3) | 18-21 (19.5) | 35-44 (40.4) | 43-44 (43.8) 173-190 (184.2) | 0-6 (2.2) 1 of 4 w/ teeth |
| Ted Crk (N. 7K. Little Snake trib.) Carbon Co. R85W, T13N N=6 | 60-62 (61.2) | 18-22 (19.5) | 36-43 (38.5) | 44-48 (45.8) 172-186 (180.8) | 3-10 (6.1) |
| Solomon Crk. (N. 7K. Little Snake trib.) Carbon Co. R85W, T12N N=9 | 60-62 (61.4) | 17-22 (19.4) | 32-38 (35.0) | 42-48 (45.2) 167-195 (179.3) | 5-13 (7.0) |

① Basibranchial teeth do not appear until first or second year of life and small specimens (ca. 100mm.) are not considered for this character.

Examples of
populations previously
judged pure.

| | | | | | |
|----------------------------------|--------|--------|--------|-----------------|-------------|
| Rock Crk., Trib. | 60-64 | 18-20 | 27-46 | 43-49 (46.0) | 3-25 (13.8) |
| La Barge Crk. (above barrier) | (62.0) | (18.8) | (35.4) | 175-200 (187.3) | |
| coll. 1971 N=14 | | | | | |

| | | | | | |
|---|--------|--------|--------|-----------------|------------|
| N. 7k. Beaver Crk. Trib. S. Piney Crk. | 60-62 | 18-22 | 35-44 | 42-52 (47.0) | 3-16 (7.5) |
| coll. 1970 | (61.4) | (20.2) | (39.4) | 163-197 (182.3) | |
| N=15 | | | | | |

→ footnote here →

Green R. samples to be completed: Nylander Crk., So. La Barge Crk., Coal Crk.,
N. 7k. Horse Crk., S. 7k. Horse Crk., S. 7k. N. Horse Crk., Horse Crk., Rock Crk. above
barrier, Rock Crk. below barrier, Red Castle Crk., Bare Crk., W. Br. N. 7k. crk., N. 7k.
Little Snake, Big Sandstone, Deadman Crk., Harrison Crk.

Lo | V | G | P | S | B |

Table 2. Character analysis of collections of cutthroat trout
from the Bear R. drainage of Bonneville basin, Wyoming.

| Locality | Vertebrae | Gillrakers | Pyloric caeca | Scales above lat. line and lat. ser. | Basibranchial teeth |
|--|-----------------|-----------------|---|---|--------------------------------|
| Giraffe Crk. (Thomas Fk. Trib.) Lincoln Co., Utah R119W, T29N. N=15 | 61-65 (62.8) | 18-21 (18.5) | 34-64 (48.3) | 34-44 (38.1) 141-176 (159.1) | 0-26 (6.9) 2 of 15 w/ teeth |
| Salt Crk. (Thomas Fk. Trib.) Lincoln Co. R119W, T29N N=17 | 61-63 (62.2) | 17-20 (18.8) | 41-57 (48.1) | 34-43 (38.4) 153-177 (165.1) | 0-15 (6.2) 2 of 17 w/ teeth |
| Headwaters Thomas Fk. (Univ. Wyo. collection) N=7 | 61-63 (62.0) | 18-20 (19.1) | 31-42 (36.2) | 35-42 (38.4) 142-173 (160.9) | 2-7 (4.4) |
| Examples of pure Bonneville cutthroat trout Museum collections, 1872- 1915, Salt Crk. Utah L. drainages. N=19 | 61-65 (63.0) | 17-22 (19.7) | — | 32-43 (37.8) 150-186 (163.0) | 3-20 (9.9) |
| Birch Crk. near Beaver, Utah N=12 | 62-64 (62.6) | 18-20 (19.1) | 24-43 (36.3) | 36-42 (38.4) 151-163 (156.3) | 1-19 (11.2) |
| Reservoir Canyon and Water Canyon near Pine Valley, Utah. N=30 | 61-64 (62.1) | 17-21 (19.2) | 29-40 36-45 (40.3) (35.3) | 38-45 (40.3) 143-176 (158.9) | 6-19 (11.2) |

Bear R. ~~colle~~ samples to be completed: Huff Crk., Raymond Crk.

| Locality | Vert. | Gillnet | V. caeca | Scales above l.l. and lat. ser. | Age/branch, trees |
|--|--|-------------------------|----------------------------------|--|--|
| S. 7K. N. Horse Crk. R 115W T34N S14 N=7 Miller, Klein - 7/27/73 | 62-63 62.5 | 20-21 20.3 | 36-46 36. 40.6 | 38-42 40.7 167-180 173.4 | 0-12 tot 7% 5.6 |
| L2 Berge Rock Crk. 2 bore barrier R114W T27N N=10 Miller, Klein - 10-24-74 | 62-64 (63) old count 60-64 62.0 | 18-21 (19.2) 18.8 | 35-45 39.8 27-46 (35.4) | 43-49 (46.0) 39-46 42.7 185.9 170-200 (187.3) | 3-25 (13.8) 4-14 all (8.8) sp. peduncle 2 no. spots in dis |
| L2 Berge Rock Crk. below barrier R114W T27N N=10 Miller/Klein - 10/24/74 | [61-64] 62.6 60-63 (62.8) | 17-20 18.6 | 33-41 (37.0) | 39-43 (41) 40-46 (43.0) 187-214 (194.6) | 2-11 all (6.0) larger spots |
| (N. Cottonwood) Nylander Crk. N=3 R. 115W T33N Miller & Klein - 7/24/73 | 62-63 (62.3) | 19-20 (19.7) | 36-43 (39.0) | 40-43 (42) 180-183 (189) | 2-8 (4.7) |
| L2 Berge So. L2 Berge Crk. R116W T28N N=6 Miller/Klein 7-31-73 | 61-65 61-64 63.2? 62 | 16-21 (18.8) | 31-41 (35.5) | 37-45 (42.3) 169-207 (190.7) | 0-13 (8.3) 1 of 6% spots on head of one or 23 lowest scale counts |
| N. 7K. N. Horse Crk. - R115W, T34N N=6 Miller, Klein 7/27/73 | all 62 | 18-21 19.5 | 33-45 37.2 | 37-46 41.7 170-199 189.3 | 0-8 1 of 6% (4.2) irregular spots x2 large spec look good |
| So. Cottonwood Red Castle Crk. N=23 R114W T32N Dunning 8-2-73 N. muddy | 60-63 (61.6) | 19-21 (20.0) | 37-52 (43.4) | 41-45 (43.4) 168-179 (174.0) | 0-3 (1.6) 5 of 15% look good small spots - small spec |
| Little Smoky Crk. N. Cottonwood N. 7K. Little Smoky Harrison Crk. Binns Oberhalter 9/4/74 N=8 13N 85W | all 62 | 18-22 20.1 | 29-49 (38.0) | 39-42 (40.5) 174-196 (185.4) | 0-11 (2.7) 3 of 7% total |

1st smotic sp
large spec
look good

sp. peduncle
2 no.
spots in dis

larger spots

cutt 12 in haw
status in large
spots

spots on head
of one or 23
lowest scale
counts

irregular spots x2
large spec
look good

look good
small spots -
small spec

Stream Name: _____ Investigators Stork, E.F.

Location: _____ McInnis, M.A.

| Fish Present | <u>Type</u> | <u>Length</u> | <u>Weight</u> | <u>K-factor</u> |
|--------------|-------------|---------------|---------------|-----------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |

Habitat:

Bottom Type: _____

Insects:

Vegetation & Banks

Pool: Riffle Ratio: _____

Surrounding Environment:

| | <u>Riffle</u> | <u>Pool</u> |
|------------|---------------|-------------|
| Mean Width | | |
| Mean Depth | | |
| Flow (CFS) | | |
| Mean Temp. | | |
| Comments | | |

| | | | | | |
|---|---|-------------------------|-------------------------|---|---|
| <p>④ (So Cottonwood) Bare Crk. ^{2 mi. N. of Muddy Crk.} R11SW, 32N¹ N=7 Miller Klein 7-24-73</p> | <p>60-64 62.4</p> | <p>17-21 19.7</p> | <p>38-44 39.7</p> | <p>37-43 40.6 176-183 / 180.1</p> | <p>6-13 (6.4) 1 of 7 w/o <i>some variation in spot size</i></p> |
| <p>⑥ Cool Crk. (S. Piney) R. 11SW 30N = Spring Trail N=6 Ridge Klein - 7-30-73</p> | <p>62-63 (62.6)</p> | <p>19-22 (20.0)</p> | <p>31-41 (35.0)</p> | <p>40-44 (42.7) 175-180 (177.2)</p> | <p>0-2 (0.7) 4 of 6 w/o <i>slightly erratic spots but essentially good.</i></p> |
| <p>⑩ Horse Crk. Trib. ^{Union Co. N=30} Black's Fk. ^{coll. site? date} near Robertson, Wyo. ^{Bob Willey (received 75) check site}</p> | <p>60-64 (61.3)</p> | <p>17-20 (18.8)</p> | <p>33-43 (37.7)</p> | <p>38-45 40.9 176-198 186.6*</p> | <p>0-9 (2.9) 6 of 15 4 of 10 (8 of 20) <i>remile area w/o brown streaks - larger spots - look good!</i></p> |
| <p>⑪ N. Fk. Little Snake N=2 Binns Oberholzer 8/31/72</p> | <p>62, 63 obvious hybrid</p> | <p>17.19</p> | <p>decomposed</p> | <p>33, 39 15 25 167</p> | <p>0 <i>obvious hybrid label faded</i></p> |
| <p>⑮ Deadman Crk., Trib. ^{N=9} N. Fk. Little Snake ^{13N} Wyo F.G. ^{9/4/74} ^{85W Binns Oberholzer}</p> | <p>61 & 62 (61.7)</p> | <p>17-20 (18.3)</p> | <p>36-45 (38.4)</p> | <p>39-42 (40.3) 167-180 (173.9)</p> | <p>0-9 (2.4) 2 of 7 w/o</p> |
| <p>⑫ N. Fk. Little Snake at USGS Gage Sta. ^{N=7} Cotton Co. ^{Binns Oberholzer 9/4/74} 85W</p> | <p>orange markings 60-62 (61.3)</p> | <p>18-22 (19.4)</p> | <p>32-40 (34.4)</p> | <p>38-43 (40.1) 177-187 (180.9)</p> | <p>1-13 (6.0)</p> |
| <p>⑭ W. Br. N. Fk. Crk. Trib. Little Snake T12N, R 86W 8/72 Binns Oberholzer N=8</p> | <p>60-62 (61.4)</p> | <p>18-20 18.8</p> | <p>decomposed</p> | <p>37-44 (42.1) 164-187 (175.6)</p> | <p>6-7 (3.6) 2 of 5 w/o</p> |
| <p>⑬ Big Sandstone ^{N=4} Tmi. 2 base w/ glaucous → Douglas Crk. - Binns - 9/13/74</p> | <p>60-62 (61.8)</p> | <p>20-22 (20.8)</p> | <p>35-41 (38.8)</p> | <p>37-42 (40.0) 161-185 (175.5)</p> | <p>0-9 (2.8) 2 of 4 w/o</p> |
| <p>⑰ Raymond Crk ^{N=24} R T27N, R19W Miller, Smith 11/6/74</p> | <p>62-64 (63.0)</p> | <p>16-19 (17.1)</p> | <p>39-51 (45.1)</p> | <p>34-38 (35.1) 174-183 (178.4)</p> | <p>0-14 (7.1) 4 of 20 w/o teeth <i>look good for w/ spots on head!</i></p> |
| <p>⑱ Huff Crk. ^{N=10} R T28N, R110W Miller, 11/7/74</p> | <p>61-63 (62.1)</p> | <p>18-20 19.1</p> | <p>38-50 (42.8)</p> | <p>33-43 (40.3) 168-182 (174.2)</p> | <p>1-7 (2.1) <i>spots smaller - perhaps other units -</i></p> |

Stream Name: _____ Investigators Stork, E.F.

Location: _____ McInnis, M.A.

| <u>Fish Present</u> | <u>Type</u> | <u>Length</u> | <u>Weight</u> | <u>K-factor</u> |
|---------------------|-------------|---------------|---------------|-----------------|
|---------------------|-------------|---------------|---------------|-----------------|

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Habitat:

Bottom Type: _____

Insects:

Vegetation & Banks

Pool: Riffle Ratio: _____

Surrounding Environment:

Riffle

Pool

Mean Width

Mean Depth

Flow (CFS)

Mean Temp.

Comments

Archie Crk.
S. c. pleuriticus ?

September 10, 1973

Dr. Robert J. Behnke, Assistant Unit Leader
Colorado Cooperative Fishery Unit
Room 102, Cooperative Units Building
Colorado State University
Ft. Collins, Colorado 80521

Dear Bob:

A few weeks ago we mailed 15 cutthroats from Archie Creek, Summit County, Utah, with the thought that they may represent a population of pleuriticus. You will recall that I talked to you about them before I retired in June.

The sample is from the main creek. I had hoped to take 10 there and 10 from a fork which is a more likely environment for a pure population. Wet trails and beaver-flooded roads, however, prevented me from getting within a reasonable (for me) walking distance of the fork.

I hope to try again and you may get another sample in due course. I am asking Wyoming to provide a permit for the second collection. Archie Creek flows in both states and the Wyoming section is more accessible.

Sincerely,

Bob S.

Robert W. Scott
1593 South 75 East
Bountiful, Utah 84010

cc:
Utah State Division of Wildlife Resources,
Salt Lake City
Wyoming Game and Fish Commission, Cheyenne
(Attn: Mr. Dexter)
Bureau of Sport Fisheries and Wildlife,
Salt Lake City

October 1, 1973

Dr. Robert J. Behnke, Assistant Unit Leader
Colorado Cooperative Fishery Unit
Room 102, Cooperative Units Building
Colorado State University
Ft. Collins, Colorado 80521

Dear Bob:

I have mailed, with the help of your Bureau, 10 additional cutthroats from Archie Creek. This sample is from the lower section of the creek in Wyoming, courtesy of Mr. Don Dexter who arranged a collecting permit for me.

I have yet to get fish from the fork that looks best for a pure population of pleuriticus, but the two samples submitted so far, the first from the upper creek in Utah, and this one, should establish the presence or absence of the subspecies and the need for an additional collection from the fork I have in mind.

Sincerely,

Robert W. Scott

Robert W. Scott
1593 South 75 East
Bountiful, Utah 84010

cc:

Wyoming Game and Fish Commission, Cheyenne
(Attn: Mr. Dexter)
Utah State Division of Wildlife Resources,
Salt Lake City
Bureau of Sport Fisheries and Wildlife,
Salt Lake City

*P.S. Thanks for your last letter, which
came before I arranged to have this typed by
the BSFW.*

Bob S.

CSU Department of Fishery and Wildlife Biology

Family _____

Scientific Name _____

Common Name _____

Collector _____ **Date** _____

Location _____

Method of Collection _____

Preservative _____

Identified By _____ **Date** _____

Fish Collections
Department of Fishery and Wildlife Biology
Colorado State University
Fort Collins, Colorado