

**STREAM:** Buck Creek, East Fork and west Fork  
**DRAINAGE:** west Fork Jarbidge River (Idaho)  
**STATE WATER CODE:** 1045  
**GAWS COMPUTER NO.:** 170501,05,155,035,035  
**SURVEY DATES:** JULY 15, 21, 22, 23 and 28, 1992  
**REPORT DATE:** *April 29, 1993*  
**WRITTEN BY:**

**SURVEY METHODOLOGY:** The U.S. Forest Service Region 4, Level III Fisheries Habitat Survey Method (March, 1989) was utilized at five Sample sites (SS) between the Forest Boundary and the headwater forks of Buck Creek and at three SS on both the East Fork and West Fork. Each SS was preplotted on the U.S. Geological Survey 7.5 min. topographic maps of the area.

The first 100 ft. at SS was sampled for fish using a one-pass effort with a Dirigo backpack electroshocker. Stunned fish were netted and held for fork length (mm) and weight (gm) measurement and general body condition assessment prior to their return to the stream. Fish seen escaping capture were recorded as misses and used in fish density estimate calculations. Aquatic invertebrate types and relative abundance were assessed following random stream and substrate inspection at SS. Habitat transects were placed 50 ft. apart. Stream discharge was calculated for each SS using timed float, velocity estimates and water width and depth measurements over a 1 or 2m length of uniform stream.

**LAND OWNERSHIP AND ACCESS:** Buck Creek and its forks head on the Jarbidge District of the Humboldt National Forest. A 0.6 mi. length of Buck Creek and the lower 0.4 mi. of the East Fork are private pasture land belonging to the Buck Creek Ranch. The same ranch also owns the 5.2 mi. length of Buck Creek and drainage below the Forest Boundary to the ranch headquarters. The lower most 2.4 mi. of Buck Creek are on public land administered by the Bureau of Land Management in Idaho despite that about half the length is in Nevada. Public access to the Forest portion of stream is possible from the Diamond A Desert located about 14 mi. from the town of Jarbidge via the road that follows lower Buck Creek into Idaho to the West Fork Jarbidge River.

**WATERSHED DESCRIPTION:** Buck Creek flows northeasterly from a 7.5 sq. mi. drainage within the Humboldt National Forest. Basin elevation ranges from 8294 ft. at the top of the basin to 6720 ft. where Buck Creek leaves the Forest. The valley form of the majority of the drainage is of a low v-shape wherein, valley sideslopes were moderately steep in the West Fork (30 %), and along Buck Creek (37 %) and steeper along the East Fork (50 %).

The valley bottom was widest in the private land pasture where it was 466 ft. wide at SS-2. Average valley bottom widths along Buck Creek, west Fork and East Fork were 184 ft., 94 ft. and 48 ft., respectively. Parent Geology of the upper drainage is described as a carbonate assemblage making way to volcanic rocks above the Forest Boundary and throughout the remainder of drainage (one-million Scale Geologic Map of Nevada, 1977).

Upland vegetation within the drainage consisted primarily of mountain shrubs dominated by sagebrush and aspen with an understory of grass and forbs. Fir trees were present above all S8 at estimated coverage of up to 20 % of the landscape.

**WATER STATUS:** Discharge in Buck Creek and in each of the Forks was maximum at the lowest elevation SS (see below).

	Discharge (cfs)		
	<u>Max</u>	<u>Min</u>	<u>Ave</u>
Buck Creek	0.127	0.025	0.058
East Fork	0.170	0.081	0.128
West Fork	0.140	0.078	0.106

The Snake River drainage basin was only 26 % of average snow water content on May 1, 1992.

Stream temperature ranged from a low reading of 56°F in the upper East Fork to an early afternoon high reading of 72°F at SS-2 on Buck Creek. The stream was recorded as clear and at a low flow stage during the survey period. However, the stream would become murky when walked in due to the presence of fine silts over much of the streambottom at various SS. water chemistry data shows that the West Fork had an alkalinity reading almost three times that of the East Fork and Buck Creek downstream of both Forks had an intermediate alkalinity value (see below).

	<u>pH</u>	<u>Alk</u> <u>ppm</u>	<u>CO2</u> <u>ppm</u>	<u>Sulphate</u> <u>ppm</u>	<u>Spec. Condo</u> <u>UMHOS/cm</u>
Buck Creek	7.5	137	4		
West Fork	8.0	223	6		
East Fork	7.8	79		8	153.4

**HABITAT CONDITION INDEX (HeI):** The individual stream Hcr ratings were "poor" with percent of optimum scores for Buck Creek, west Fork and East Fork being 52.1, 51.5 and 56.5, respectively. The lowest rated individual Hcr parameter in each stream was pool structure in the East Fork (0.0 %) and in the West Fork (17.8 %) and streambottom in Buck Creek (25.6 %). The estimated mean pool structure ratings through fish sample areas in the East Fork, West Fork and Buck Creek were 36.1 %, 57.8 % and 54.0 % of optimum, respectively. The quality sized pool area within the fish population surveyed area in the East Fork had "poor" cover and was

quite shallow.

Bank stability percent of optimum was rated "good" to "excellent" only at one SS on each stream. The drainage wide mean bank soil stability and bank vegetation stability percent of optimum were of 63.0 and 65.0, respectively. Dominant bank cover vegetation at SS included a combination of grass and willow along lower Buck Creek SS, and grass-forb-sedge mixtures along upper Buck Creek SS; aspen at the upper East Fork SS, and grass-forb mixtures at lower East Fork SS; and grass-forb-aspen mixtures along the West Fork SS.

Percent of optimum bank cover ratings averaged 58.5, 62.5 and 54.2 in Buck Creek, West Fork and East Fork, respectively.

**STREAM CHANNEL TYPE AND STABILITY:** The lower portion of Buck Creek was characterized by a gradient of 2.0 % at both SS-2 and SS-3 and 2.5 % at SS-1. The upper two SS had a 4.0 % gradient. Channel morphology was modified by beaver at all but, SS-5. Dominant streambottom types in Buck Creek were silt and gravel at all but, SS-5 where boulders and silt were dominate. Channel morphology was modified by beaver and ungulate trampling throughout the majority of Buck Creek. A Rosgen's B6/B4 channel type would best describe Buck Creek. Stream channel stability evaluations all rated "fair" in Buck Creek and averaged 97 which, is closer to a "poor" score (115) than it is to a "good" score (76).

The West Fork was classified as an A-4 channel at SS-1 where the gradient was 5.0 % and gravel was the dominant substrate. The middle SS had a gradient of 3.5 % and the upper SS gradient was 2.0 %. silt and gravel were dominant bottom substrates and a B-4/B-6 channel type was evident. The East Fork had a narrower valley and steep sideslopes. Stream gradients were 3.0 %, 5.5 % and 5.0 % at SS-1, SS-2 and SS-3, respectively. The streambottom was composed of a mixture of mostly gravel, rubble, and silts. The channel at SS-1 was classed a B3 type while the other two SS were an A3 type. Both the West Fork and East Fork had an overall, mean stream channel stability ratings of "fair" wherein, the scores were similar.

**RIPARIAN CONDITIONS:** willow was the dominate riparian overstory vegetation along Buck Creek. Identified species of willow included Salix drummondiana and S. boothii. willow density along Buck Creek varied from 10 % to 50% and averaged 28 % of a riparian zone that averaged 113 ft. wide. Understory composition consisted of grasses, sedges and forbs in that order of abundance. Aspen presence was sparse along Buck Creek presumably, due to the combination of heavy beaver and cattle use. The Buck Creek riparian zones were all rated to be in "fair" condition.

Aspen and willow were the dominated the riparian overstory along the East Fork. Fir trees were also occasionally present. Grasses and forbs comprised the majority of understory plants. The mean

width of the riparian zone was 47 ft. The riparian habitat condition ratings were "fair" at the lower two 5S and "good" at SS-3.

Aspen presence varied along the West Fork wherein, the lower two SS were aspen riparian communities and the upper SS was a low density S. drummondiana site that may have been an aspen site at some previous time. Grasses, forbs, and sedges were variously present in the understory. Both aspen community sites were in "fair" condition while the willow community at 5S-3 was rated in "poor" condition.

The lowest scored riparian criteria were as follows:

<u>criteria</u>	<u>Locations</u>
shrub density	All
understory composition	All
shrub damage	BC-2,5j WF-2j EF-1,2
understory damage	BC-3,4,5j WF-All
ground coverage	All except, BC-1,3; WF-1
soil damage (compaction and erosion)	WF-Allj EF-2j BC-4,5
tree damage	BC-5
tree dominance	BC-4

**HABITAT VULNERABILITY:** The Index of Habitat Vulnerability (HVI) to management activities was "high" at BC-3, EF-1, and WF-3j and "moderate" at all other 5S's. Streambank sensitivity ratings as determined from the combined stream channel stability scores for upperbank vegetative protection and lowerbank rock content averaged a score of 15 (10-20). A score of >13 indicates that one season of moderate livestock grazing can result in damaged streambanks. Ungulate damage ratings averaged 18.3 % or "light" in the East Fork. Ungulate damage ratings in both Buck Creek and in the West Fork averaged 50.2 % and 52.3 %, respectively. Excluding the "moderate" ungulate damage ratings (35 and 37.5 %) found on Buck Creek within the private pasture, the remainder of stream averaged "heavy" damage (58.3 %). The West Fork showed a "moderate" amount of damage (37.5 %) where streambanks were fairly stable and "heavy" damage ( 57.5 % and 62.5 %) elsewhere. Average undercut streambank frequency at habitat transect sites was only 12.7 %.

Streambottom embeddedness ratings were "moderate" (34.4 %) in the East Fork; "heavy" (59.5 %) in the West Fork and "excessive" (78.8 %) in Buck Creek where beaver dams were common. Fine substrate across habitat transects comprised about 60 % of the streambottom in Buck Creek whereas, fines comprised 34 % and 27 % of the streambottom in the West Fork and East Fork, respectively.

**FISH POPULATION:** Rainbow;redband trout were found in all three drainages. Fish were observed in the large beaver pond located above fishless, SS-3 and are presumed to be capable of moving above

the pond to at least the confluence of the two forks. The trout density in the East Fork below the pond averaged 52.8 fish/mi. over the 1.6 mi. of stream. Fish distribution in the West Fork occurred at SS-2 located just above the junction of two forks at a density of 158.4 fish/mi. while, at SS-1 density was 1108.8 fish/mi. only one fish was sampled in Buck Creek and it was collected at SS-5. Trout were observed in a beaver pond below SS-4 and within the habitat transect area at SS-2. Beaver ponds in Buck Creek undoubtedly, held the majority of trout in Buck Creek. The upper distribution limit of fish in both Buck Creek and the West Fork is controlled by available streamflow and rearing habitat. Estimated length of occupied stream in Buck Creek and in the West Fork is 3.4 mi. and 1.2 mi., respectively.

Captured trout appeared to be in relatively "good" body condition. Trout length-frequency analysis indicates three or four age groups present in the Buck Creek drainage (see below).

Age 0 - 62 rom (55-69) n= 9  
Age I - 83 rom (78-86) n=10

Age II - 99.8 rom ( 96-107) n=4  
Age IV?- 147.5 mm (146-149) n=4

The only previous recorded fish population work completed on Buck Creek was done at one 50 ft. length of stream on private land about 0.5 mi. above the Buck Creek Ranch. Electrofishing resulted in the capture of 20 rainbow/redband trout averaging four inches long. Anglers were checked with rainbow/redband trout taken from Buck Creek in 1973 and records also show that brook trout were caught in lower Buck Creek in 1969. There are no records of brook trout having been stocked in Buck Creek however, 1000 fingerling cutthroat trout from Hagerman Hatchery were stocked in Buck Creek on 10/20/36.

**AQUATIC FAUNA AND FLORA:** Mayflies were found at every SS within the drainage and two types were identified. Caddisflies were found at all but, two SS. Stonefly larvae were found at all but, the upper two SS on the West Fork. Planaria were at all SS in the two Forks however, they were only seen at SS-3 in Buck Creek. Water striders and aquatic beetles were mostly in Buck Creek and the West Fork as were Chironomid fly larvae. Snails and water mites were only found at one SS each. Earthworms were noted in the East Fork and at SS-5 in Buck Creek. The East Fork had what seemed to be the most abundant macroinvertebrate population. Algae was present at varying densities but, not at all SS. Moss and emergent streamside grass and/or sedges were also present at some SS.

**BEAVER STATUS:** Active beaver ponds were present at Buck Creek 88-1 and at SS-4. Inactive beaver dams were noted at Buck Creek 88-2 and 8S-3. Old aspen cut areas were present along Buck Creek. Old beaver activity was noted at 8S-2 on the East Fork and at 88-3 on the West Fork.

## CONCLUSIONS

**STREAM'S IMPORTANCE:** Buck Creek is a major tributary drainage of the West Fork of the Jarbidge River that contains a fishable, wild rainbow/redband trout population.

**ANGLER USE:** Buck Creek angler use for the 10 year period 1981-1990 averaged 32.5 angler days use. During the period of survey there was a party of four camped on Buck Creek and equipped to fish.

**ISSUES AND CONCERNS:** Of primary concern in the Buck Creek drainage are the deleterious impacts that cattle grazing continues to have on the stream and riparian environment. Specific impacts include bank destabilization and subsequent streambed sedimentation; and riparian vegetation over-utilization.

**RECOMMENDATION:** U.S. Forest Service grazing management must be revised to lessen the impact that livestock are having on the majority of the Buck Creek C&H Allotment. Elimination of hot season grazing may have to occur in order to rehabilitate damaged riparian zones.

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