



West Fork Blacks Fork – How It Is

## **Survey Of**

## **Middle Fork Beaver Creek and West Fork Blacks Fork**

## **Uinta Wilderness, Utah**

### **Report By**

**Dr. John G. Carter  
Utah Director**

**Western Watersheds Project  
P.O. Box 280  
Mendon, Utah 84325**

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Middle Fork Beaver Creek – How The West Fork  
Blacks Fork Could Be

## Introduction

During August and September, 2000 the Middle Fork Beaver Creek watershed was surveyed for ground cover and vegetative production in meadows. During September 2001, the West Fork Blacks Fork watershed was surveyed for ground cover and vegetative production. These visits, combined with a previous visit to West Fork Blacks Fork in 1999, provided photo-documentation of the incredible differences in condition between the grazed West Fork Blacks Fork and the long-term ungrazed Middle Fork Beaver Creek.

Ground cover surveys were conducted in key areas consisting of sensitive upland portions of high elevation meadows. In these key areas, plot locations were determined using a Garmin GPS 12 handheld global positioning system. Ground cover data were collected using the Beltline Transect method employed by the U.S. Forest Service. This method is described in FSM 2209.21-93-1 (R-4 Amendment) and employs use of a nested frequency plot frame to collect 8 ground cover observations at 20 locations along five radial transects from the plot center for a total of 800 observations for each key area. Plants were clipped at three locations on alternating transects for drying and weighing to determine plant standing crop. Plot clippings were taken from 2' x 2' areas at the end of the belt transects. Plant samples were dried and weighed.

## Results

Maps of survey locations and major features are provided in [Figure 1](#). Photographs of survey locations are provided in Figures 2 through 6. Photographic comparisons of landscape and wilderness features between the ungrazed Middle Fork Beaver Creek and the grazed West Fork Blacks Fork are provided in Figures 7 and 8. These figures are described in Table 1, are hyperlinked to the report and may be accessed by double-clicking on the Figure Titles. The results of the ground cover measurements and vegetation production data are presented in Tables 2, 3 and Chart 1.

**Table 1. Figures**

<a href="#">Figure 1</a>	Maps of WFBF and Middle Fork Beaver Creek Showing Survey Locations
<a href="#">Figure 2</a>	Photos of Middle Fork Beaver Creek Ground Cover Survey Locations
<a href="#">Figure 3</a>	Photos of West Fork Blacks Fork Units 1 and 2 Ground Cover Survey and Photopoint Locations
<a href="#">Figure 4</a>	Photos of West Fork Blacks Fork Unit 3 Ground Cover Survey and Photopoint Locations
<a href="#">Figure 5</a>	Photos of West Fork Blacks Fork Unit 4A Ground Cover Survey and Photopoint Locations
<a href="#">Figure 6</a>	Photos of West Fork Blacks Fork Unit 4B Ground Cover Survey and Photopoint Locations
<a href="#">Figure 7</a>	Photos Contrasting Stream and Lake Conditions, Wilderness Qualities Between West Fork Blacks Fork and Middle Fork Beaver Creek
<a href="#">Figure 8</a>	Photos Contrasting Tributaries, Trails and Forest Conditions, Wilderness Qualities Between West Fork Blacks Fork and Middle Fork Beaver Creek

**Table 2. Vegetation measurement locations**

Location	Latitude	Longitude
MF Beaver Cr Long Meadow	40° 52 11.4	110° 13 42.6
MF Beaver Cr Upper Basin 1	40° 50 9.3	110° 13 19.8
MF Beaver Cr Upper Basin 2	40° 50 20.1	110° 12 28.7
WF Black Fork Pasture 1	40° 52 49.3	110° 40 01.7
WF Black Fork Pasture 4A 1	40° 45 24.9	110° 40 23.0
WF Black Fork Pasture 4A 2	40° 45 38.6	110° 40 03.0
WF Black Fork Pasture 3	40° 46 25.8	110° 39 35.8
WF Black Fork Pasture 4B 1	40° 45 39.7	110° 79 34.9

**Ground Cover and Standing Crop of Vegetation:** The data and photographs show major differences in ground cover characteristics and standing crop of herbaceous vegetation between high elevation meadows in the Middle Fork Beaver Creek watershed and the West Fork Blacks Fork watershed.

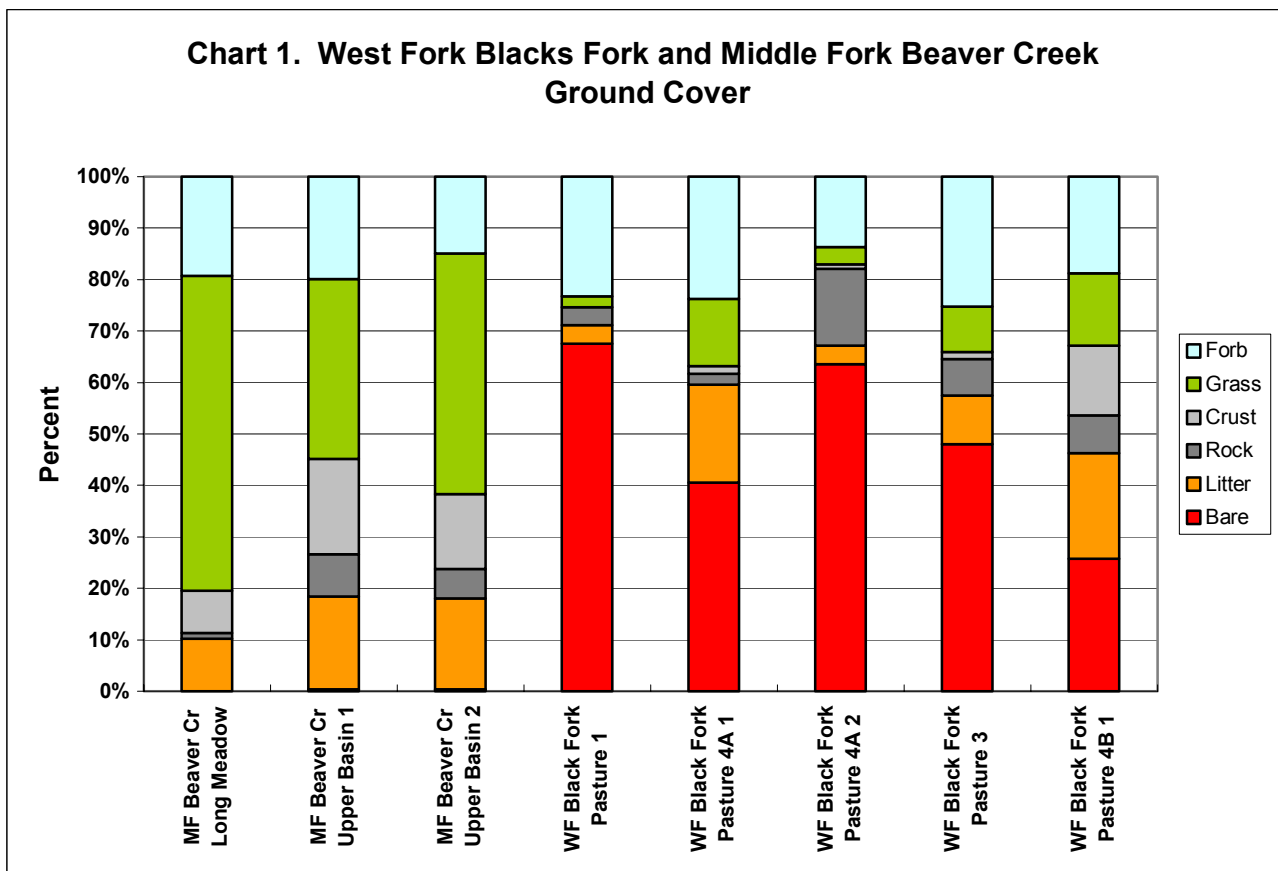
**Table 3. Ground cover percent and vegetation standing crop**

Location	Bare %	Litter %	Rock %	Crust %	Grass %	Forb %	Gms per sq ft	Pounds per acre
MF Beaver Cr Long Meadow	0.00	10.25	1.13	8.13	61.25	19.25	6.57	630.1
MF Beaver Cr Upper Basin 1	0.39	17.98	8.23	18.53	35.00	19.87	3.71	355.8
MF Beaver Cr Upper Basin 2	0.38	17.63	5.75	14.50	46.88	14.88	6.35	609.3
WF Black Fork Pasture 1	67.50	3.63	3.50	0.00	2.13	23.25	1.84	176.5
WF Black Fork Pasture 4A 1	40.50	19.13	2.13	1.38	13.13	23.75	2.77	266.1
WF Black Fork Pasture 4A 2	63.50	3.63	15.00	0.88	3.38	13.63	1.33	127.9
WF Black Fork Pasture 3	48.05	9.35	7.09	1.39	8.82	25.29	1.39	133.0
WF Black Fork Pasture 4B 1	25.74	20.53	7.34	13.57	14.07	18.76	1.57	151.0
MF Beaver Cr Means	0.25	15.29	5.04	13.72	47.71	18.00	5.5	531.7
WF Black Fork Means	49.06	11.25	7.01	3.44	8.30	20.93	1.8	170.9

The Middle Fork Beaver Creek watershed has been closed to livestock grazing for approximately 20 years. Mean ground cover for locations surveyed was 99.75%, ranging from a low of 99.62% to 100%. Grass cover averaged 47.71% with a range of 35% to 61.25%. Forb cover averaged 18% with a range of 14.88% to 19.87%. See [Figure 2](#).

The West Fork Blacks Fork has been grazed 1250 ewe/lamb pairs of domestic sheep from July 6 to September 15 each year with an additional 1400 ewe/lamb pairs trailing through the allotment on July 6 and back out on September 10 each year (USDA 1999). The ground cover data collected from the West Fork Blacks Fork locations reflect this heavy use. Mean ground cover for the five locations surveyed was 50.94%, ranging from a low of 32.5% to a high of 74.26%. Grass cover averaged 8.3% with a range of 2.13% to 14.07%. Forb cover averaged 20.93% with a range of 13.63% to 25.29%. It should be noted that Unit 1 forbs were dominated by dandelion and yarrow. Herbaceous vegetation standing crop in upland meadows at the end of the grazing season in the West Fork Blacks Fork averaged 170.9 pounds per acre, while in

the Middle Fork Beaver Creek, the standing crop averaged 531.7 pounds per acre. See [Figure 3](#), [Figure 4](#), [Figure 5](#) and [Figure 6](#).



**Determination of Capable Acres:** Regional guidance (USDA, 2001) for determining capability, suitability and stocking rates has indicated that areas of slope >45% or with forage production less than 200 pounds per acre are not considered capable for domestic sheep grazing. Further, Holechek et. al. (1998) and page I-5 of USDA (1999), state that slopes greater than this should be considered unusable by domestic sheep. In order to estimate potentially capable areas in the West Fork Blacks Fork allotment, topographic maps were scaled to determine capable acres for each of the four grazing units mapped in Appendix A, Map B in the Predecisional AMP/EA for the West Fork Black's fork USDA (1999). These areas include: (1) the total area of each unit, (2) areas with slopes greater than 45%, (3) forested areas which in the WFBF have little herbaceous vegetation and (4) meadows with slopes less than 45%. This does not imply that grazing on slopes at lower angles is capable or suitable for livestock grazing because other factors including slope, cover and erodibility should be taken in to account as erosion and runoff increase with increasing slope and decreasing ground cover. The estimated acreage of these areas are shown in Table 2. It should be noted that a substantial portion of the forested area is also greater than 45% slope. Overall, only 2408 of 13915, or 17.3% of the land in the West Fork Blacks Fork allotment are capable for domestic sheep (not forested and on slopes <45%).

**Table 2. Estimated Acres of Grazing Units in the WFBF Allotment**

<b>Unit No</b>	<b>Overall Area</b>	<b>Slopes &gt;45%</b>	<b>Forested</b>	<b>Meadow &lt;45%</b>
Unit 1	2377	980	2236	119
Unit 2	3328	1710	2154	238
Unit 3	4718	3159	1915	912
Unit 4	3493	1327	652	1376
Totals	13915	7176	6957	2408

## **Discussion**

**Ground Cover, Vegetation Production and Sheep Stocking:** The differences in ground cover between the ungrazed Middle Fork Beaver Creek and the heavily grazed West Fork Black's Fork are stark, with ground cover in the West Fork Blacks Fork reduced by almost exactly half compared to the Middle Fork Beaver Creek. The potential ground cover for alpine grasslands has been established by the Forest Service as 97 – 100% (USDA 1995, 1996). The ground cover measurements in the Middle Fork Beaver Creek ungrazed watershed validate this. Data provided in USDA (1999) for a key area in the West Fork Blacks Fork showed that bare ground percent increased from 5% in 1961 to 39.5% in 1997, providing validation for the high percent bare ground found throughout uplands in our 2001 survey. This Forest Service data shows that ground cover has remained unacceptably low in the WFBF alpine area since 1965 and that in 1961, ground cover was 95%, compared to 60.5% in 1997.

Vegetation production reflects the ground cover values. Plot clippings in both watersheds were compared. The vegetation production in the Middle Fork Beaver Creek averaged 531.7 pounds/acre and ranged from 355.8 to 630.1 pounds per acre. These figures agree with Holechek et al (1998), which gives a range of 445 to 623 pounds/acre. End of season residual vegetation in the West Fork Blacks Fork averaged 170.9 pounds/acre with a range of 127.9 to 266.1 pounds per acre. Comparing means, the residual vegetation in the West Fork Blacks Fork watershed is 170.9/531.7 or 32% of potential. This indicates that utilization in the West Fork Blacks Fork in 2001 was 68% on uplands, much greater than the 50% stated in USDA (1999). This was following the first year of a 15% reduction in numbers implemented prior to the 2001 grazing season. It should also be noted that Unit 4B was to be rested during 2001, yet we have included the standing crop for that area in our utilization estimate. Therefore, the 68% utilization is conservative and most likely an underestimate.

While the Record of Decision for Rangeland Health (USDA 1996) failed to address utilization by domestic sheep, the proposed alternative for maximum forage utilization for forage species in alpine areas was provided in Table 2-5 of the FEIS Rangeland Health (USDA 1995). The levels recommended in the FEIS were:

Slopes less than or equal to 10% in satisfactory condition	40%
Slopes less than or equal to 10% in unsatisfactory condition	20%
Slopes greater than 10% in satisfactory condition	30%
Slopes greater than 10% in unsatisfactory condition	10%

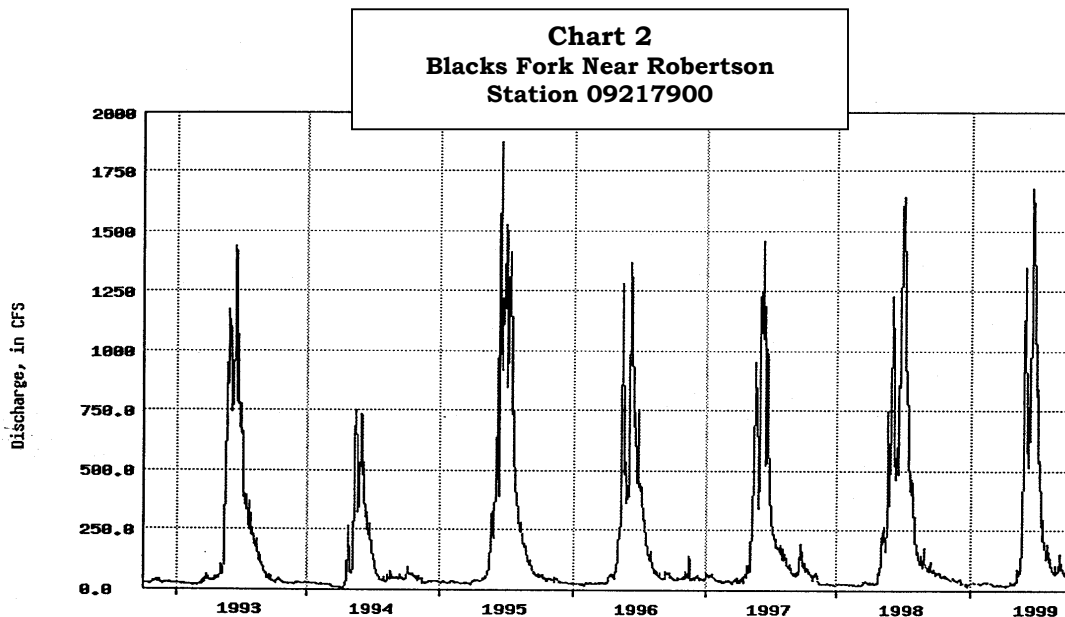
The alternative selected in the ROD for Rangeland Health did not provide these utilization standards for alpine areas. It did provide a maximum utilization standard for non-alpine uplands and aspen of 50% for areas in satisfactory condition. This was which was used in the WFBF Predecisional EA (USDA 1999). Clearly, however, the intent of the Rangeland Health EIS was that alpine areas, areas in steeper terrain and in unsatisfactory condition should be adjusted downward based on their condition. Holecheck et al (1998) recommend 20 – 30% utilization for alpine areas and stated that the lower figure should be used where range condition is poor. The bare ground and severely degraded conditions present in the WFBF alpine certainly represent poor condition.

This analysis shows that within the entire allotment, 51.5% of the area consists of slopes greater than 45%, Forested areas with little herbaceous vegetation cover 49.9% of the allotment. Forested areas and steep slopes combined comprise a substantial majority of the allotment. Meadows with slopes <45% (capable) comprise only 17.3% of the allotment. This does not take into account the suitability of livestock grazing when wilderness character, wildlife and recreational use are considered as they should be under the Multiple Use and Sustained Yield Act as well as the National Forest Management Act.

Prior to implementing the reduction in sheep numbers and alternate years' grazing in Units 4A and 4B, sheep density on the capable acres in the West Fork Blacks Fork was 1250 ewe/lamb pairs per 2408 acres, or 1.93 acres per ewe/lamb pair. This does not count the 1400 ewe/lamb pairs trailing through the area for an undetermined length of time. The current stocking rate of 1075 ewe/lamb pairs and only grazing half of Unit 4 each year results in a reduction in annual capable grazed area from 2408 acres to 1720 acres. The number of acres per ewe/lamb pair thereby decreased from 1.93 to 1.6 acres per ewe/lamb pair, or an increased intensity of livestock grazing of over 20% on already degraded areas.

**Watershed Impacts:** A paper prepared by Dr. Paul Packer, retired research scientist for the U.S. Forest Service provides results of watershed research relating watershed characteristics to runoff and erosion in northern Utah forests (Packer, 2002). This paper was provided to the Evanston Ranger District in a previous comment letter. It shows that when ground cover falls below 70%, overland flow increases rapidly, accompanied by soil erosion. At slopes of 35%, soil erosion is seven times greater than on slopes of 5%. The paper also indicates that trampling of more than 10% of the soil surface at ground cover of 70 – 75% increases soil erosion beyond limits affording protection. Other peer-reviewed papers validate the relationship between livestock grazing, reduced ground cover and increased runoff and soil erosion. Trimble and Mendel (1995) estimated that peak storm runoff from a 120 hectare basin in Arizona would be 2 to 3 times greater when heavily grazed than when lightly grazed. The Universal Soil Loss Equation (Ruhe, 1975) predicts that for a given slope and soil, increased runoff and erosion are directly related to reduced ground cover.

The photographs provided in Figure 3, Figure 4, Figure 5 and Figure 6 show the landscape-scale removal of vegetation in the West Fork Blacks Fork, including steep slopes. This loss of vegetative cover and grazing until vegetation is dormant, without allowing time for regrowth, leaves the watershed with little resistance to overland flow during spring snowmelt or summer storms. A recent paper in Rangelands (Galt et. al. 1999) noted that grazing vegetation during dormancy can result in a reduction of as much as 50% of production in the following year. Observations in both the WFBF and Middle Fork Beaver Creek watersheds during August and September make it clear that upland vegetation is going dormant by mid-August. To continue grazing these areas until mid-September is clearly not in accord with sound range management principles and does not allow protection of the watershed during snowmelt. While camped on a tributary of the West Fork Blacks Fork in 1999, a flash flood resulted from a rainfall of less than 0.1". Chart 2 is a hydrograph of the Blacks Fork downloaded from the U.S. Geological Survey website showing extremes of peak flows during snowmelt that illustrate the lack of the watershed's ability to retain water.



### **Wilderness Values:**

The photographs in [Figure 7](#) and [Figure 8](#) provide comparisons between similar areas in the currently grazed West Fork Blacks Fork and the long-term ungrazed Middle Fork Beaver Creek. These photos illustrate what confronts wilderness visitors as they travel along the trails, meadows, streams and forests in the West Fork Blacks Fork. They are confronted with wet meadows where domestic sheep and herder's horses have trampled the wet meadows into mudholes; upland stretches where a wide strip has been laid bare, the trail widened and adjacent areas denuded of vegetation; stream crossings where sheep and herder's horses have trampled banks out of existence over an area much wider than the trail itself; forest understory turned to dust and lacking herbaceous vegetation; meadows stripped of their wildflowers and grasses; bare and

eroding uplands and slopes; ground littered with sheep and horse manure, where one must move sheep manure to find a place big enough to place a backpacking tent. On top of this, there is the constant smell of sheep manure instead of clean, cool air and flowers. Couple this with the constant bleating of sheep instead of the singing of birds and chattering of squirrels and you have the visual, olfactory and auditory impressions of the West Fork Blacks Fork – **A Wilderness Area That is Not!**

Then there are the wildlife impacts. Wildlife observations in the West Fork Blacks Fork are few and far between compared to Uinta Wilderness watersheds that are not grazed by sheep. In the Middle Fork Beaver Creek, observations of elk, moose, snowshoe hare are common. In the West Fork Blacks Fork, they are rare. Where are the black bears? Studies have shown that the diet of black bears consists mainly of herbaceous vegetation, fruits, nuts and a small portion consisting of insects, rodents and carrion. Removal of the majority of the herbaceous vegetation in the West Fork Blacks Fork by domestic sheep displaces numerous deer, elk, moose, bears, small mammals and birds through loss of forage and habitat structure. Holechek et al (1998) provide daily vegetation dry matter consumption rates for livestock and wildlife. Some of the equivalents are:

1 Domestic Sheep	=	1 Bighorn Sheep
1 Domestic Sheep	=	1 Mule deer
4.6 Domestic Sheep	=	1 Elk

With thousands of domestic sheep grazing the West Fork Blacks Fork each summer, it is clear that thousands of wild animals are eliminated from the watershed. Wildlife are part of the wilderness experience along with aesthetics, other sights, sounds and smells. The West Fork Blacks Fork does not meet the intent of the Wilderness Act as a place “Untrammelled by man”. Based on the limited area of capable lands in the West Fork Blacks Fork and the degradation caused by livestock, the West Fork Blacks Fork is also not suitable for livestock grazing under the intent of the National Forest Management Act.

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