

Pine Creek/Sulphurbeds Allotment TWITCHELL CREEK #1 (TWC1)

Riparian Browse Assessment

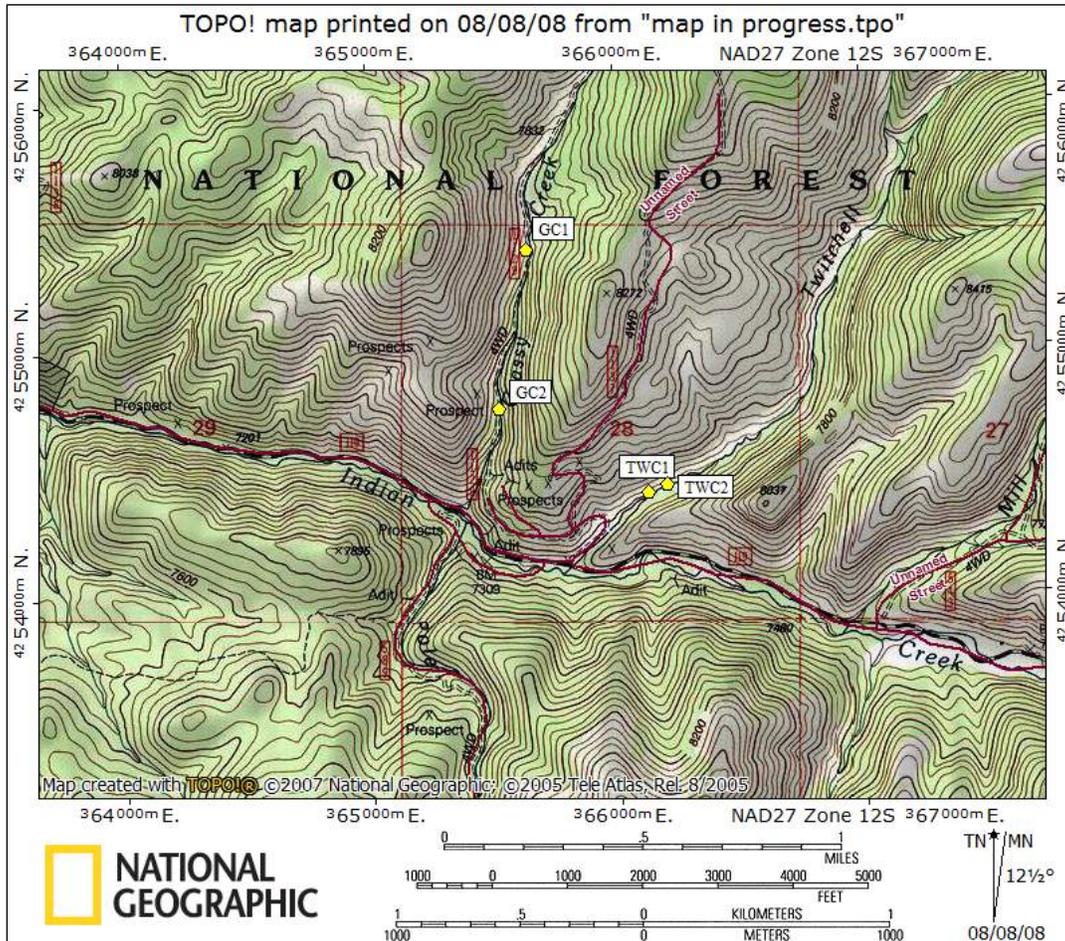
- (1) July 16, 2008
- (2) October 9, 2008
- (3) October 11, 2009
- (4) October 9, 2010
- (5) July 6, 2011

Bank Stability

October 11, 2009

Riparian Grass/Grasslike Utilization

- (1) October 9, 2008
- (2) October 11, 2009
- (3) October 9, 2010
- (4) July 6, 2011



Twitchell Creek #1 (TWC1)
Gravel floodplain and willow community
between creek and trail

- (1) 7/16/2008 Martin/David
- (2) 10/9-10 /08 O'Brien/Hoskisson
- (3) 10/11/09 O'Brien/Hoskisson/Otting
- (4) 10/9/2010 Hoskisson/Wheeler
- (5) 7/11/2011 Hokisson/Jamerson

FLNF/Beaver RD	Allotment: Pine Creek/Sulphurbeds Pasture: Wildcat
Stake: NAD CONUS 27 12N E 0366119 N 4254405 Next to a juniper (downstream end) NAD83 366504E 4254609N	Elevation: 7,386'
Aspect: Southeast	Animal sign: Cattle (2008-2010)_
Ave. Width Riparian Area: Young willows are present 17' from the creek, while mature willows are present 26' from the creek.	
Dominant vegetation: Rocky mountain juniper (<i>Juniperus osteosperma</i>), common juniper (<i>J. communis</i>), Booth's willow (<i>S. boothii</i>), <i>Salix sp.</i> , curl-leaf mt. mahogany (<i>Cercocarpus ledifolius</i>), yarrow, dandelion, <i>Poa pratensis</i> (<i>Agrostis sp.?</i>), dagger-leaf rush (<i>Juncus ensifolius</i>), woolly mullein and clover. 2009 notes: Nebraska sedge (<i>Carex nebrascensis</i>), pinyon pine, <i>Chaenactis douglasii</i> , <i>Cirsium sp.</i> , Columbia needlegrass (<i>Achnatherum nelsonii</i> ; seeded), squirreltail (<i>Elymus elymoides</i> ; seeded), <i>Ranunculus sp.</i> , <i>Lupinus sp.</i>	
Other notes: To our knowledge no riparian inventories have been conducted on Twitchell Creek.	

Twitchell Creek #1 is located in a flat gravel floodplain of Twitchell Creek which flows at the base of the northeast flank of Little Shelly Baldy Peak into Indian Creek. Booth's willows (*Salix boothii*) – mostly mature plants <6' tall and a few young plants – are growing along the creek and in the gravel (Figs. 1-4). The banks are laid back with trampling, and the creek is wide for its water volume (Fig. 3). The opposite, north bank is a steep, sagebrush covered slope.

(1: 7/16/08) As of July 16th, 45% of willow leaders were browsed and dead and 51% of subleaders were browsed and dead. Cattle are scheduled to be in the Wildcat Pasture from August 16th through September 30th and were present near the end of the road, about 0.1 mile below Twitchell Creek #1 on July 16th. The ten willows of 2.1'-3' height had an average of 10 subleaders within 6" of the tallest leader.

(2: 10/9/08) As of October 9, 2008, 74% of willow leaders were browsed; and 84% browsed or dead, and 91% of subleaders were browsed or dead. All vegetation was sparse and heavily grazed or sparse (Fig. 4). Eleven aspen <6' were encountered on the transects: 36% of tallest leaders and 91% of subleaders were browsed.

(3: 10/11/09) By October 11, 2009, 76% of willow leaders were browsed; and 85% of subleaders were browsed, essentially the same browse pressure by October 2008 (see p. 4). Despite the fact that all willow are mature (i.e., with >10 stems), as in 2008, only two individuals were 5.1'-6' tall; and 1 willow >6' tall (2' width at base) is present. Although this pasture (Wildcat Pasture) was to be rested in 2009, several cattle entered late in the season after most grasses had already matured. The still-green *Carex* and Kentucky bluegrass in the riparian area were utilized, and the willow are present in this same area.

(4: 10/9/2010) This pasture was to be rested in 2010. However, some evidence of trespass cattle were found in the area (Figs 8-9). Furthermore, in July through September of 2010, the Twitchell Canyon wildfire burned 9,500 acres and swept through the upper portions of the Twitchell Canyon watershed. As a result, a fairly large amount of sediment was recently deposited within Twitchell Creek (Figs 10-11). This Pasture was to be rested in 2010, and the browse on tallest willow leaders was much reduced with only 14.8% browsed. However, the browse on subleaders was similar to previous years at 71.4%.

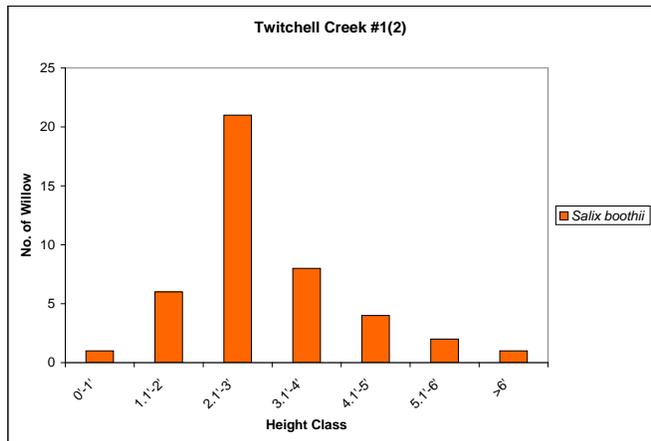
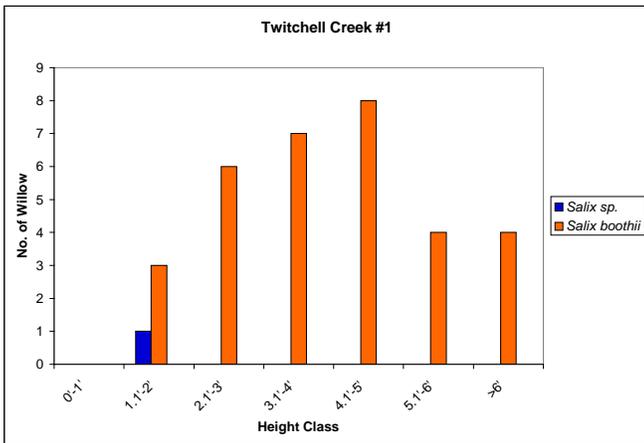
The height distribution changed slightly as there were a higher proportion of individuals in the 4.1'-5' range in 2010. The flood debris in many cases had either completely or partially covered some smaller willows. It will

be important to see if the bare sediment allows willow seedlings to appear in 2011, and if so, whether they will be free of excessive ungulate browsing.

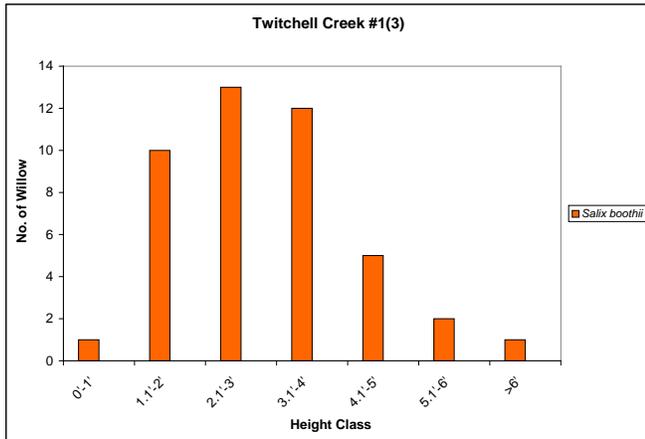
(5: 7/6/2011) This pasture was to be rested again this year. The vegetation growth along the transect was abundant compared to previous years, likely due to the fire in the area and two years of rest from livestock grazing. No leaders showed browsing, and only 15% of the subleaders were browsed.

Height Distribution

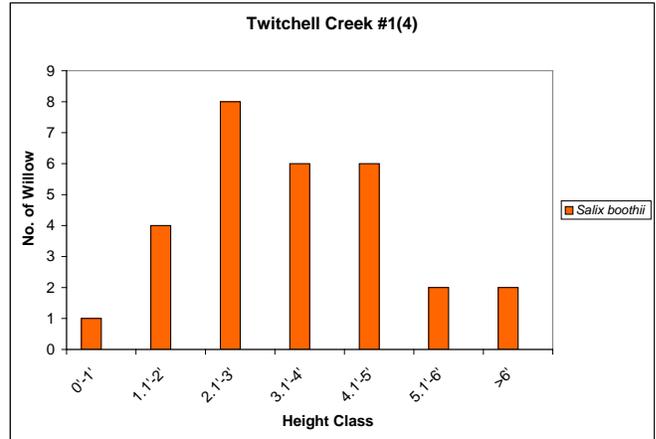
July 16, 2008 and October 9, 2008



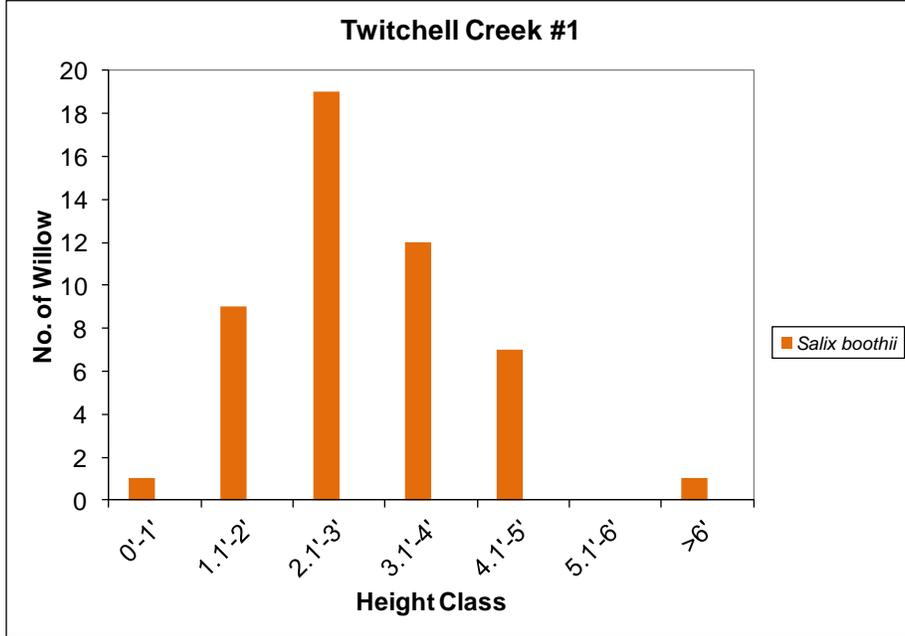
October 11, 2009



October 9, 2010



July 6, 2011



Browse

July 16 and October 10 2008

Twitchell Creek #1 Percent Browsed or Dead Leaders				
	July 16, 2008			October 10, 2008
	1 <i>Salix</i> sp.; 28 <i>Salix boothii</i> <6' No <i>Salix</i> sp. >6'			42 <i>Salix boothii</i> <6' 1 <i>Salix boothii</i> >6': Width 2'
	Total willow	<i>Salix</i> sp.	<i>Salix boothii</i>	<i>Salix boothii</i>
% tall leaders browsed	44.8	100.0	42.9	73.8
% tall leaders browsed or dead	44.8	100.0	42.9	81.0
% subleaders browsed	47.8	66.7	47.0	10.7
% subleaders browsed or dead	51.0	66.7	50.3	99.8

October 11, 2009

Twitchell Creek #1(3)	
43 <i>Salix boothii</i> <6' 1 <i>Salix boothii</i> >6': Width 2'	
	<i>Salix boothii</i>
% tall leaders browsed	76.2
% tall leaders browsed or dead	76.2
% subleaders browsed	84.8
% subleaders browsed or dead	85.1

October 9, 2010

Twitchell Creek #1(4)	
27 <i>Salix boothii</i> <6' 2 <i>Salix boothii</i> >6': Ave. width 2.3'	
	<i>Salix boothii</i>
% tall leaders browsed	14.8
% tall leaders browsed or dead	22.2
% subleaders browsed	71.4
% subleaders browsed or dead	71.4

July 6, 2011

Twitchell Creek #1(5)	
48 <i>Salix boothii</i> <6' 1 <i>Salix boothii</i> > 6', width 2'	
	<i>Salix boothii</i>
% tall leaders browsed	0.0
% tall leaders browsed or dead	2.0
% subleaders browsed	14.7
% subleaders browsed or dead	14.7



Fig. 1 (7/16/08). Gravel floodplain and Booth's willow.



Fig. 2 (7/16/2008). Twitchell Creek and willows on both banks.



Fig. 3 (10/9/08) Twitchell Creek is shallow and widened with bank trampling; sparse willow cover.



Fig. 4 (10/9/08) Willows heavily browsed in riparian area.



Fig. 5 (10/12/09) Old “young” (i.e., 3-10 stems) willow, 2.5’ tall. Number of stems is not indicative of age in heavily-browsed willow patches.



Fig. 6 (10/12/09) Near Twitchell #1 is a small patch of old Booth willow >6’ tall. Note closely-grazed bank and riparian area.



Fig. 7 (10/12/09) During the one year of rest, Columbia needlegrass seeded out (foreground); Sedges and Kentucky bluegrass were grazed by late-season cattle.



Fig 8 (10/9/2010) Cow prints along Twitchell Creek (during a 'rest' year.)



Fig 9 (10/9/2010) Cow hoofprints in Twitchell Creek (in a rest year)



Fig 10 (10/9/2010) Visible flood debris from recent fire



Fig 11 (10/9/2010) Recent sediment deposition within and beside stream from recent fire in upper reaches.



Figure 12 (7/6/2011) Good regrowth of willows



Figure 13 (7/6/2011) Willows along transect

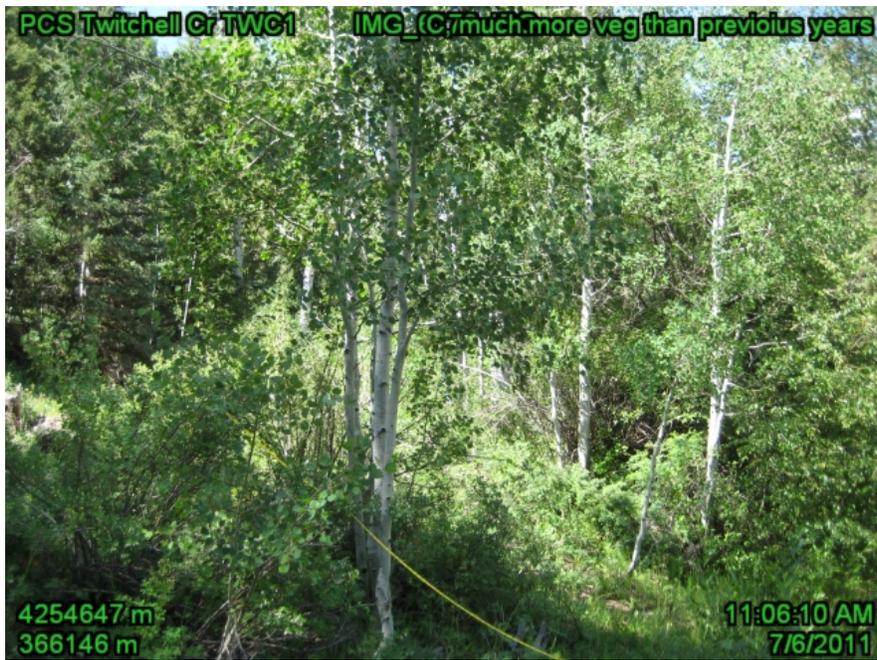


Figure 14 (7/6/2011) Abundant vegetation in area compared to previous years



Figure 15 (7/6/2011) Abundant willows along transect

Twitchell Creek #1 (TWC1)
Bank Stability
 (1) October 12, 2009

Stable	66%
Recent depressed vegetation	22%
Recent shearing	12%

The bank is 66% stable in this “rest” year (Fig. 8). TWC1 is located mostly on a gravel/cobble bar on the inside edge of a bend in Twitchell Creek. This creates most of the bank stability of the site.

The stability is also partially due to the fact that the bulk of the riparian graminoids, although grazed to <2”, are heavily rhizomatous, Kentucky bluegrass (exotic) and Nebraska sedge. Kentucky bluegrass, shallowly rooted, can nevertheless be sheared (12%; Fig. 9). The recent shearing and depressed vegetation evidently were caused by cattle. Cow patties were seen on the transect site (Fig. 11).

TWC1 is located mostly on a gravel/cobble bar on the inside edge of a bend in Twitchell Creek. This creates most of the bank stability of the site.



Fig. 8 (10/12/09). Widened, cobbled bank, 66% “stable”



Fig. 9 (10/12/09). A trampled portion of the bank. Note densely rhizomatous Nebraska sedge and Kentucky bluegrass.

Bank Stability Methodology

Stream bank stability is measured using a modified Daubenmire monitoring frame. Appendix D of Burton, et al, 2007 (Multiple Indicator Method; MIM). The first version described on pages D-1 and D-2 is used for these surveys. The Daubenmire frame indicates five points along the 50 cm frame where stability is assessed every 12.5 cm.

The Daubenmire frame is laid along the riparian greenline. The stability of the bank is assessed in terms of slumping or sloughing of the bank, trampling, bare soil, steepness, ground cover, vegetation, shearing, or any other noticeable change in the bank. Notes are made on unusual conditions.

The five measuring points along the Daubenmire frame are the points where stability is assessed. These points are visually extended from the frame on the greenline to the point where the extension hits the edge of the water or the scour line whichever comes first.

Contrary to MIM, we include impacts of both present and past years, as the two are often a judgment call, and both may be affecting riparian functioning. We note when the impacts are clearly not current year.

Burton, TA, ER Cowley, and SJ Smith. 2007. *Monitoring Stream Channels and Riparian Vegetation—Multiple Indicators*. Idaho Technical Bulletin 2007-01, BLM/ID/GI-07/001+1150. April.

**Pine Creek/Sulphurbeds Allotment
TWITCHELL CREEK #1(2) (TWC1)
Riparian Grass/Grasslike Utilization
(1) October 10, 2008
(2) October 9, 2010
(3) July 6 2011**

Allotment: Pine Creek/Sulphurbeds

Pasture: Wildcat

Creek/Stream: Twitchell Creek

2008 Annual Operating Instructions dates of livestock entry/exit: August 16-September 16

2009 AOI: Wildcat Pasture was to be rested

2010 AOI: Wildcat Pasture was to be rested

Twitchell Creek #1 is located in a flat gravel floodplain of Twitchell Creek which flows at the base of the northeast flank of Little Shelly Baldy Peak into Indian Creek. Booth's willows (*Salix boothii*) – mostly mature plants <6' tall and a few young plants – are growing along the creek and in the gravel (Figs. 1-4 above). The banks are laid back with trampling, and the creek is wide for its water volume (Fig. 3 above). The opposite, north bank is a steep, sagebrush covered slope. Graminoid vegetation is sparse (Figs. 3-4 above)

2008: This transect was read approximately 10 days after cattle were scheduled to have left Wildcat Pasture. A grass or sedge was encountered within 3" of the transect at 81% of the 90 transect points; forbs were essentially absent. Kentucky bluegrass accounted for 67% of these encounters. The average height of sedges and rushes was less than an inch (0.9"; i.e., shorter than the Kentucky bluegrass; Fig. 5) and that of an unidentifiable grass was 1.4" The Forest standard was met for neither Kentucky bluegrass nor sedges/rushes.

Graminoid utilization October 10, 2008											
Kentucky Bluegrass (<i>Poa pratensis</i>)				Other Grasses				Sedges and/or Rushes			
Ave. ht(in)	N	Ave. ht(in)	N	Ave. ht(in)	N	Ave. ht(in)	N	Ave. ht(in)	N	Ave. ht(in)	N
Accessi ble		Inaccessi ble		Accessi ble		Inaccessi ble		Accessi ble		Inaccessib le	
1.3"	42	8"	3	1.4"	6	NA	0	0.9"	10	4.5"	2

2009: This point-intercept transect was read in the first of two years Wildcat Pasture was to be rested. However, late-season cattle entered and grazed the sedges and grasses still green at the riparian edge (Fig.11) A grass or sedge was encountered by the transect at 18 (26%) of the 68 transect points; forbs at 3 points. The change in percentage of points where graminoids were encountered in 2008 (81%) cannot be compared to the 26% in 2009. In 2009 we used a strict point intercept to count plants and ground cover (see methodology note below); in 2008 a plant within 3" of the transect point was counted. Vegetation is about as sparse as in October 2008. Since the pasture was not truly rested we cannot state what changes would have occurred with rest. Photographs from July 2008 show that the site is capable of much more vegetation. Compare Figs. 1 and 2 with Figs. 4, 7, 8 and others above.

Grass/Grasslike Utilization: October 12, 2009												
	Kentucky Bluegrass (<i>Poa pratensis</i>)				Other Grasses				Sedges and/or Rushes			
Graminoids	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts
	1.2	9	1.0	2	1.2	9	13.0	2	0.7	5	N/A	
Other	Forb	2	Bare	16	Rock	16	Litter	36	Lichen, moss, biological crust			4

2010: Graminoid presence was generally greatly reduced along Twitchell Creek #1 as the recent fire and rains prior to our assessment caused much of the site to be buried in 4-6 inches of sediment. Moreover, much of the graminoid vegetation that was not buried was horizontal and held next to the wet sediments and was generally not particularly accessible to any grazing animal. These reasons account for very low (2.6%) available graminoid vegetation this site this year.

Grass/Grasslike Utilization: October 9, 2010												
	Kentucky Bluegrass (<i>Poa pratensis</i>)				Other Grasses				Sedges and/or Rushes			
Graminoids	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts
	2.0	1.3	N/A	0.0	4.0	1.3	10.0	2.6	N/A	0.0	N/	0.0
Other	Forb	5	Bare	58	Rock	9	Litter	5	Lichen, moss, biological crust			0

2011: Since this area was rested again and had some time to recover from the fire and subsequent sediment movement, the area showed little evidence of grazing. The effects of the fire and subsequent flood can still be seen by the increased amount of bare ground this and last year (58 and 56% respectively) as compared to 2009 (16%). The ground was still dominated by bare soil, but there was also 4% Kentucky bluegrass, 5% other grasses and 12.5% sedges or rushes.

Grass/Grasslike Utilization: July 6, 2011												
	Kentucky Bluegrass (<i>Poa pratensis</i>)				Other Grasses				Sedges and/or Rushes			
Graminoids	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts	Ave. ht(in) Accessible	% pts	Ave. ht(in) Not Accessible	% pts
	24	1	30	3	6	1	6	4	4.6	12.5	N/A	
Other	Forb	21	Bare	56	Rock	24	Litter	21	Lichen, moss, biological crust			N/A

Methodology note

2008 method: The average height (inches) of a grass or sedge was measured every 2' from the creek (0') to 48' along the five browse transects, except where a Gambel's oak or bigtooth maple thicket ended the riparian meadow. The grass nearest to, but no farther than 3" from, the transect point was recorded. Kentucky bluegrass was the only grass encountered, to which a Fishlake NF utilization standard (1.5" rather than 4" for hydric grass/grasslike species) is applied¹. A sedge was encountered twice (a 4" utilization standard applies).

The droop height of plants accessible to large ungulate grazing was recorded separately from the droop height of plants inaccessible to grazing, e.g., at the base of a rock. Those grasses inaccessible were often laying down, with blades much longer (e.g., 10"-12") than droop height (e.g., 2").

2009 method changes: In 2009, plants or ground cover encountered at the five point-intercept transects were recorded. The five point-intercept transects at each site were extended only as far back from the bank as the last willow encountered within the 6' belt (i.e., 3' to each side of the point-intercept transect).

When the blade length of a grass or grasslike plant is >4X as long as the droop height, the actual blade length is recorded and reported e.g., Kentucky bluegrass with a droop height of 3" and a blade length of 17" would be noted. None such occurred in this transect in 2009.

2010 method change: Per a request from the USFS, the main transect was lengthened to 200' (in comparison to a 100' transect in previous years) to capture more of the riparian area. Perpendicular transects for graminoid utilization and willow browse were then set at 40' apart.

2011 method change: Bare ground beneath plants is recorded as well as between plants, thus graminoid ground cover totals may exceed 100%.

¹ The four inch stubble height for hydric (i.e., adapted to a wet, but not flooded habitat) plants is part of the allowable forage utilization criteria that were revised through a Fishlake National Forest Plan amendment in 2002. These revised forage utilization criteria prescribe allowable use levels for both upland and riparian sites. As the Fishlake NF explains this: "The description for riparian areas is a uniform 4" stubble height. Reaching the 4" stubble height triggers the time to move livestock, either between units or off the allotment. These criteria allow no manipulation to plan use of expected regrowth—once the 4" stubble height is reached, livestock are moved, without the opportunity for twice-over use. Livestock are moved to the next pasture or removed from the allotment when any utilization threshold (upland forage utilization, stream bank alteration, riparian forage utilization, riparian vegetation stubble height, or riparian woody browse utilization) is reached. Meeting or exceeding one of these threshold levels initiates a move of livestock." (USFS 2006)

Fishlake National Forest riparian utilization standards include (USFS 2006):

Riparian hydric species:

4" triggers the time to move livestock between units or off the allotment

Riparian Emphasis Management Areas

6" triggers the time to move livestock between units or off the allotment

Non-hydric Sod-Forming Grass Species in Riparian Areas

1 ½ " Primarily Kentucky bluegrass--Triggers the time to move livestock between units or off the allotment



Fig. 10 (10/10/08) Sedges commonly browsed shorter than 1.5" (averaged 0.9")



Fig. 11 (10/12/09). Nebraska sedge is 1"-2" in riparian wet spot; note recent cow patty (center) and browsed willow (background).



Fig. 12 (10/12/09). While Kentucky bluegrass is 11" tall because pasture was rested in 2009, late-season cattle have eaten sedges (see riparian edge) to <2" tall.



Fig 13 (10/9/2010) Heavy sediment deposition within and next to stream bed that buried much of the available graminoid vegetation.



Fig 14 (10/9/2010) heavy deposition throughout stream channel and beyond from recent fire and heavy rains to bury many willows and graminoid vegetation.



Fig 15 (7/6/2011) Graminoid vegetation along transect



Fig 16 (7/6/2011) Mixture of sediments, bare ground, and graminoid vegetation along transect