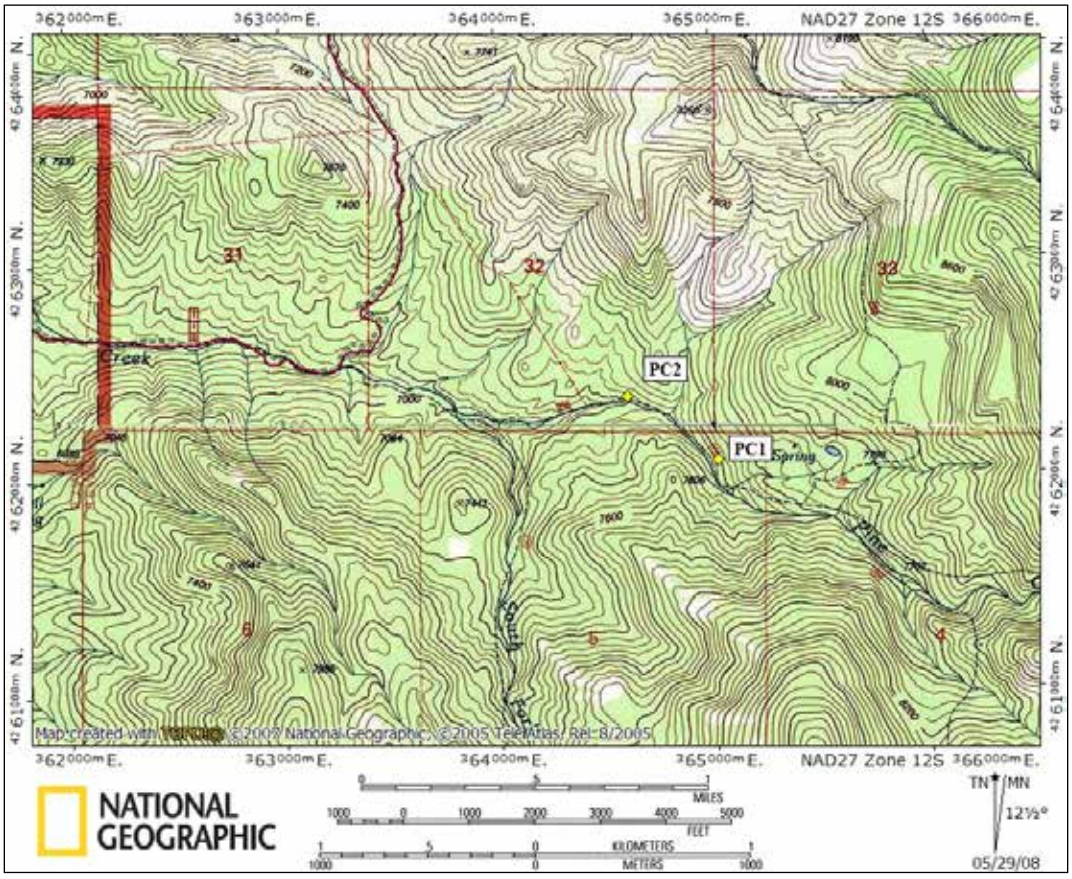
Pine Creek/Sulphurbeds Allotment
PINE CREEK #2 (PC2)
Riparian Browse Assessment

(1) May 7, 2008
(2) October 9, 2008
(3) October 6, 2009
(4) September 2, 2010
(5) July 5, 2011
(6) October 21, 2011

Riparian Grass/Grasslike Utilization

(1) October 9, 2008
(2) October 6, 2009
(3) September 2, 2010
(4) July 5, 2011
(5) October 21, 2011



PINE CREEK #1 (PC1)	May 7 and October 9, 2008 Hoskisson/O'Brien 2010: Hoskisson/ O'Brien/ Wheeler 2011: Hoskisson/ Jamerson; Hoskisson/ Wheeler
Fishlake NF/Beaver RD	**Allotment:** Pine Creek/Sulphurbeds **Pasture:** Pine Creek
Stake: 12S E 364664 N 4262252 (downstream) NAD CONUS 27 **NAD83**: 364598 E 4262456 N Upstream side of uppermost of 3 old cottonwoods between the creek and the road	**Elevation:** 7,667'
Aspect: SW	**Animal sign:** cattle, wild ungulates
Ave. Width Riparian Area: Old cottonwood extend 70' back to the NE, but now mostly only cottonwood <6' are present in what would have been the cottonwood gallery.	
Dominant vegetation: Narrowleaf cottonwood, bigtooth maple, *Rumex crispus, Equisetum arvense*, snowberry, sparse Kentucky bluegrass, mountain-lover (*Paxistima myrsinites*)	
Other notes: Pine Creek #2 is in Reach A21-7 of the 2003 Level II Riparian Inventory which was noted as having a "downward trend" in forage (Shell Valley Consulting 2003).	

Pine Creek #2 is located along Pine Creek within the Pine Creek/Sulphurbeds Allotment (Fishlake NF) at the western edge of the Tushar Mountains and south of Sulphurdale. The riparian area is narrow and is dominated by Kentucky bluegrass, cottonwood 1'-3', and a variety of shrubs (Fig. 1), but the remains of an old cottonwood gallery extend onto a slope to the NE, 65'-70' from the creek (Fig. 2) A steep bank ~2' high affords some protection from ungulates for creekside cottonwood (Fig. 3). The cottonwood on the floodplain and slope, however, are bushy (e.g., average 4-5 leaders within 6" of the tallest leader in October on cottonwood 2'-4' tall; see leaders chart, p. 4 below), indicating repeated browsing.

(1: May 7, 2008) As of May 7, 67% of the tallest leaders and 77% of the subleaders of the cottonwood <6' were browsed. Cattle were scheduled to be present in the Pine Creek Pasture June 16 through August 16.

(2: October 9, 2008) As of Oct. 9, 84% of the tallest leaders and 88% of the subleaders of the cottonwood <6' were browsed. Some cottonwood are dead from browsing, or otherwise wholly browsed (see., e.g., Fig. 4). Although cattle were scheduled to be moved from Pine Creek Pasture August 16, on October 9 six cattle were present on the trail downstream of Pine Creek #2 (photo available on request).

Accessible cottonwood elsewhere along the creek are similarly browsed (e.g., see Fig. 5).

(3: October 6, 2009) The percentages of tallest leaders and all leaders browsed is essentially the same as on Oct. 9, 2008 with 81.8% of tallest leaders browsed and 89% of subleaders browsed. We found a significant number of dead cottonwood in the one foot height category.

(4: September 2, 2010) Through the 2009 Tushar Collaboration some pastures managed by the Beaver Ranger District were to be grazed at a reduced 30% utilization. In 2010, the Sulphurbeds and Little North Creek pastures were to be grazed at 30%, utilization, but Pine Creek Pasture was still remaining at 60% allowable utilization. Cattle were scheduled to be in the Pine Creek pasture between June 16 and August 15 of 2010.

By September 2, 35% of the tall leaders of narrowleaf cottonwood were browsed (less than in 2009 or 2008) but 79% of subleaders within 6 vertical inches of the tallest leader were browsed, similar to 2008 (78% subleaders browsed). The height distribution of the cottonwoods in the area, similar to that of 2009, is deficient in the 4.1'-6' height class signifying a deficiency of trees that are able to get above browse height. There was also a clear preference for 3.1'-4' tall cottonwoods by ungulates as the number of leaders in this height class was far above the rest.

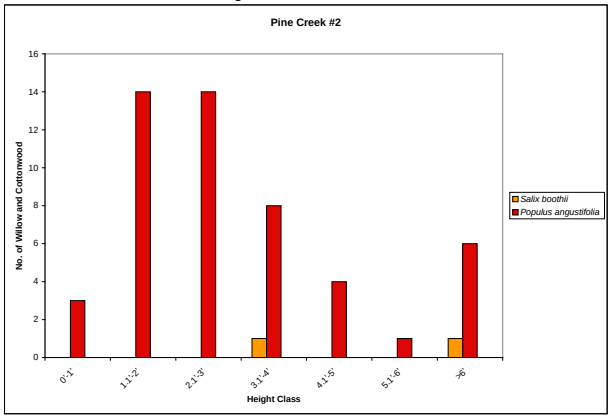
5: July 5 and October 21, 2011

The Pine Creek pasture was to be grazed at a 30% utilization limit between July 16 and September 15 in 2011. Grand Canyon Trust visited this site prior to cattle entry (July 5) and after cattle exit (October 21). The browse on the cottonwood showed a clear increase in October (76% of tall leaders browsed or dead) vs 20% in July, and 84% of subleaders browsed (Oct) vs 47% (July). The number of leaders per cottonwood tree <6' is high (4-6 in July), indicating lack of a single leader and bushiness. The differences in number and diameter of cottonwood over 6' tall between July and October 2011 reflect a different (random) starting point for each of the five perpendicular transects along the base transect. In both cases, there are no cottonwoods 5.1'-6' tall, but some of the cottonwood >6' are of 1"=3" diameter, meaning that there has been at least some recruitment in recent years.

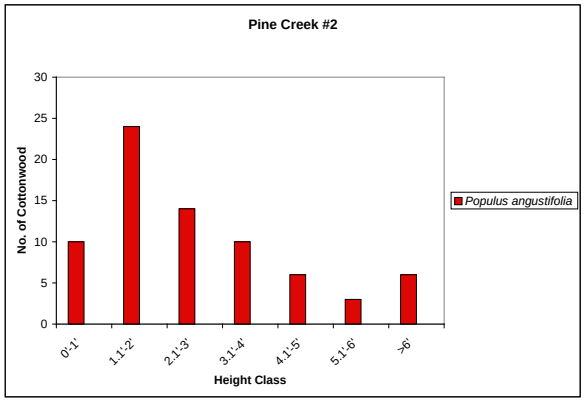
The Pine Creek riparian conditions (e.g., denuded banks, houndstongue, spring entrained within the trail, incised creek, heavily-browsed cottonwood <6') documented in the photo essay submitted for the 2010 review continue in 2011. The over-use of Pine Creek has continued.

Height Distribution

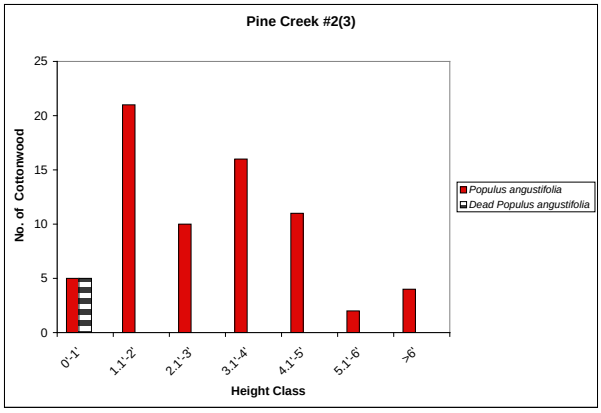
May 7, 2008



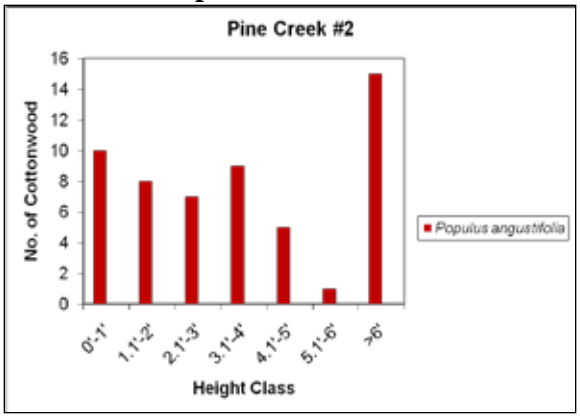
October 9, 2008



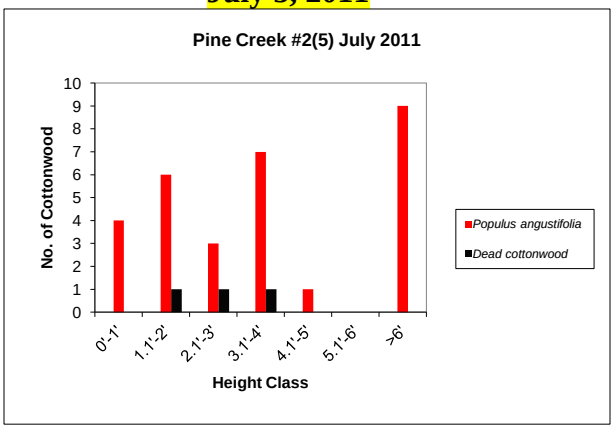
October 6, 2009



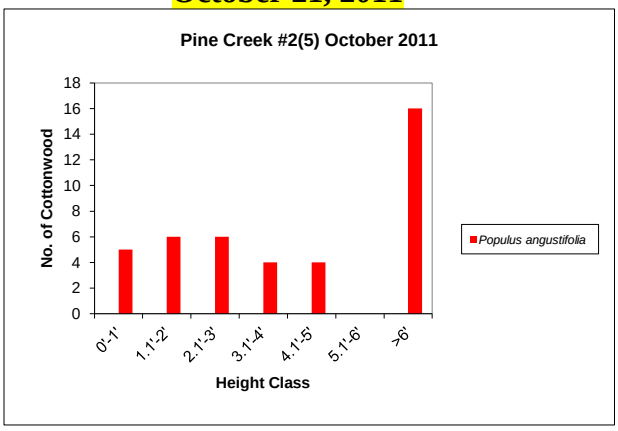
September 2, 2010



July 5, 2011



October 21, 2011



Browse

May 7 and October 9, 2008

Pine Creek #2(2) Percent Browsed or Dead Leaders			
		May 7, 2008 1 *Salix boothii*, 44 *Populus angustifolia* <6' 6 *Populus angustifolia* >6': Ave. DBH 5.3" 1 *Salix boothii* >6' tall, 3' wide	October 9, 2008 67 *Populus angustifolia* <6' 6 *Populus angustifolia* >6': Ave. DBH 6.5"
% tall leaders browsed	*Salix boothii*	0	
	Populus angustifolia	67.4	83.9
% tall leaders browsed or dead	*Salix boothii*	0	
	Populus angustifolia	76.7	83.9
% subleaders browsed	*Salix boothii*	0	
	Populus angustifolia	77.7	87.8
% subleaders browsed or dead	*Salix boothii*	0	
	Populus angustifolia	81.3	87.8

October 6, 2009

Pine Creek #2(3) 65 *Populus angustifolia* <6' 5 dead *Populus angustifolia* <6' 4 *Populus angustifolia* >6': Ave. DBH 0.5"	
	Populus angustifolia
% tall leaders browsed	81.8
% tall leaders browsed or dead	81.8
% subleaders browsed	89.0
% subleaders browsed or dead	89.0

September 2, 2010

Pine Creek #2(4) 40 *Populus angustifolia* <6' 15 *Populus angustifolia* >6' Ave DBH= 7.2"	
	Populus angustifolia
% tall leaders browsed	35.1
% tall leaders browsed or dead	45.9
% subleaders browsed	78.6
% subleaders browsed or dead	78.6

July 2011

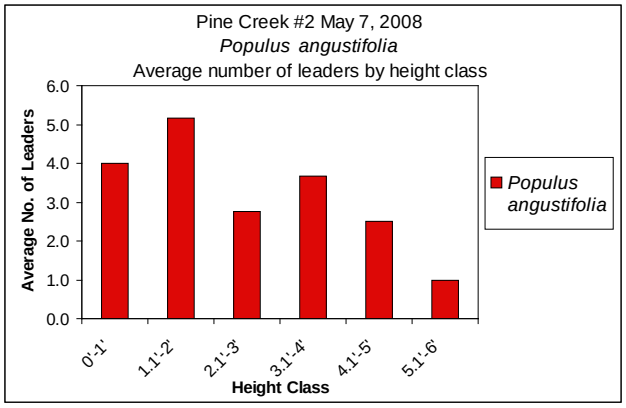
Pine Creek #2(5) July 2011 21 *Populus angustifolia* <6' 9 *Populus angustifolia* >6' Ave DBH= 10.5"	
	Populus angustifolia
% tall leaders browsed	10.0
% tall leaders browsed or dead	20.0
% subleaders browsed	47.4
% subleaders browsed or dead	47.4

October 2011

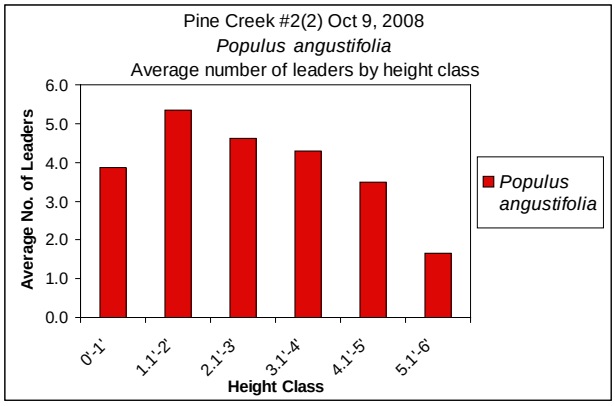
Pine Creek #2(5) Oct 2011 25 *Populus angustifolia* <6' 16 *Populus angustifolia* >6' Ave DBH= 4.1"	
	Populus angustifolia
% tall leaders browsed	76.0
% tall leaders browsed or dead	76.0
% subleaders browsed	83.8
% subleaders browsed or dead	83.8

Number of Leaders by Height Class

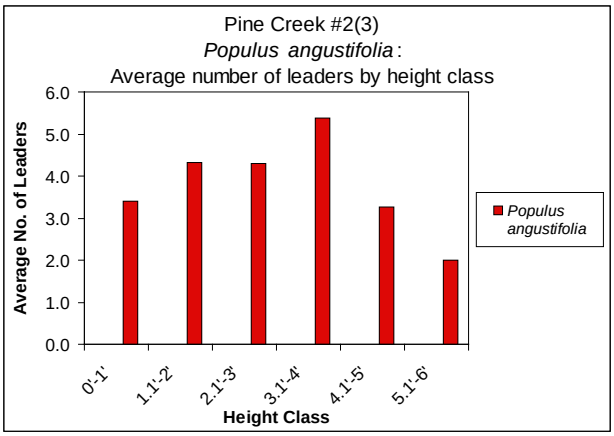
May 7, 2008



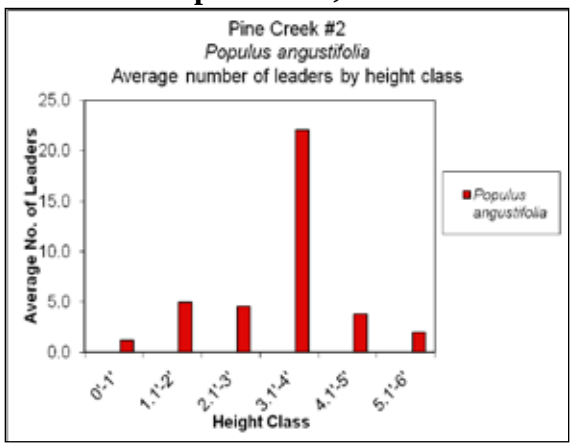
October 9, 2008



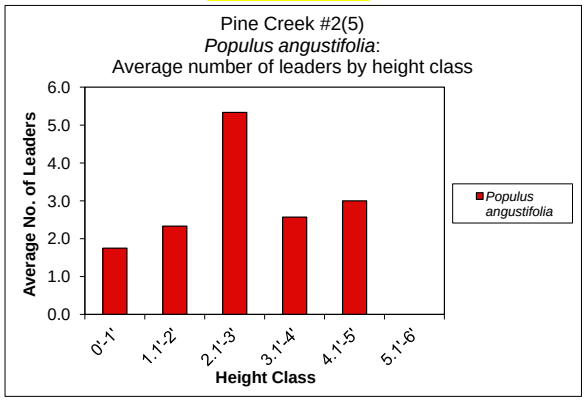
October 6, 2009



September 2, 2010



July 5, 2011



October 21, 2011

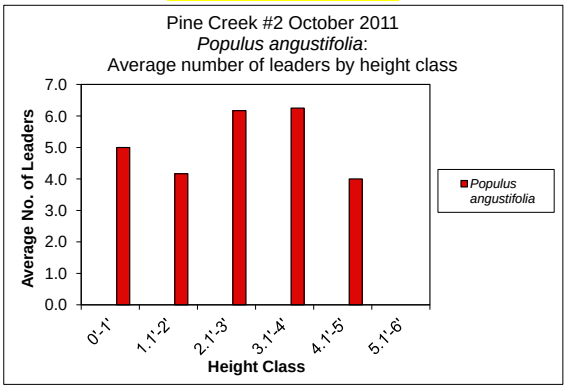


Fig. 1 (5/7/08) Kentucky bluegrass-dominated bank with cottonwood <6' and old narrowleaf cottonwood.

Fig. 2 (5/7/08) Slope to the NE, with old cottonwood extending 70' from creek, and young cottonwood.

Fig.3 (10/9/08) Steep (2') bank provides a micro-site largely inaccessible to ungulates.

Fig. 4 (10/9/08) Browsed 2' cottonwood.

Fig. 5 (10/9/08) Heavily browsed cottonwood patch downstream from Pine Creek #1 and #2.

Fig. 6 (10/6/09) Cattle left the PC2 transect site as we approached. Additional cattle were in the shrubs on the side of the route.

Fig. 7. (9/2/2010) Abundant bare ground directly adjacent to Pine Creek

Fig 8 (9/2/2010) Closely grazed area next to the creek where aspen are regenerating.

Fig 9. (9/2/2010) One of the many houndstongue plants in the Pine Creek #2 area.

Fig 10 (7/5/2011) Cottonwood seedling at waterline

Fig 11 (7/5/2011) Transect C in July

Fig 12 (10/21/2011) ORV tracks through wet meadow along Pine Creek

Fig 13 (10/21/2011) A spring that is entrained in the roadbed alongside Pine Creek

PINE CREEK #2 (PC2)
Bank Stability
Oct. 6 2009

Stable	**92%**
Compacted	**2%**
Shearing	**6%**

(Oct. 6, 2009) Along this transect Pine Creek flows through an incised channel. The edge of the stream is largely anchored with logs and rocks. Cottonwoods and maples grow along the bank. Few graminoids grow on the bank. The isolated flood plain above the creek is predominantly bare soil. There is no continuous line of vegetation to mark a greenline. Using the edge of the flood plain or the narrow and incompletely continuous line of vegetation along the narrow edge of the creek both indicate a largely stable but uncovered bank. Rain and run-off would still cause sediments to enter Pine Creek, especially with a bare flood plain.

Fig. 14 (10/06/2009)Pine Creek can be seen on the right with a precipitous drop from the flood plain to the creek. The bank is anchored by cottonwoods, logs, and rocks. Note the bare ground and defoliated sapling-sized trees.

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 #2 (PC2)
Riparian Grass/Grasslike Utilization

(1) October 9, 2008
(2) October 6, 2009
(3) September 2, 2010
(4) July 5, 2011
(5)October 21, 2011

Allotment: Pine Creek/Sulphurbeds
Pasture: Pine Creek
Creek/Stream: Pine Creek
2008 Annual Operating Instructions dates of livestock entry/exit: 6/16-8/16
2008 Surveyors: Hoskisson/O'Brien
2009 Surveyors: Hoskisson/Chilcoat
2010 Surveyors: Hokisson/ O'Brien/ Wheeler
2011 Surveyors: Hoskisson/ Jamerson, Hoskisson/Wheeler

Pine Creek #2 is located along Pine Creek within the Pine Creek/Sulphurbeds Allotment (Fishlake NF) at the western edge of the Tushar Mountains and south of Sulphurdale. The five grass/grasslike utilization transects extended from the creek (0') to the road (22'-34').

(2008) Kentucky bluegrass and one other grass species were encountered, and they were sparsely distributed (i.e., a grass was encountered within 3" at 27% of the 78 transect points; 73% of the points were bare soil within 3" of the transect point. The average height for Kentucky bluegrass was the same as for the other grass: 1.6".

Grass/Grasslike Utilization: 10/9/08											
Kentucky Bluegrass (*Poa pratensis)*				Other Grasses				Sedges and/or Rushes			
Ave. ht(in) Accessibl009e	N	Ave. ht(in) Inaccessible	N	Ave. ht(in) Accessible	N	Ave. ht(in) Inaccessible	N	Ave. ht(in) Accessible	N	Ave. ht(in) Inaccessible	N
1.6"	19	5"	15	1.6"	4	2.2"	2	NA	0	NA	0

(2009) Grasses, sedges and rushes were greatly diminished. Bare ground and litter accounted for 90% of the points along the transects. A half-dozen cattle were seen on the transect on Oct. 6 although the 2009 AOI indicated the cattle were scheduled to be out of Pine Creek Pasture by Aug. 15 (Fig. 6 above). Compare the appearance of the site on May 7, 2008 (Fig. 1 above) with Oct. 6, 2009 (Fig. 7 above and Fig. 8 below). Utilization appears excessive even for *Poa pratensis.*

Fig. 15 (10/06/2009)The transect is dominated by bare ground.

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Fig 16 (10/21/2011) Pine Creek 2 area looking East

Fig 17 (10/21/2011) Pine Creek 2 transect looking West

Fig 18 (10/21/2011) Pine Creek 2 area transect C

PineCreek2												
Grass/Grasslike Utilization: October 6, 2009												
	Kentucky Bluegrass (*Poa pratensis)*				**Other Grasses**				**Sedges and/or Rushes**			
Graminoids	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts
	-		-		5.2	2	-		2.0	0.79	-	
Other	**Forb**	4	**Bare**	35	**Rock**	3	**Litter**	55	**Lichen, moss, biological crust**			0

(2010) Bare ground and litter were the dominant features along Pine Creek #2 (40% and 38% respectively; Fig. 11), and as a not-surprising result, numerous areas of Pine Creek (including close to Pine Creek #2) are infested with houndstongue (Fig 9). Additionally, an ORV trail is located directly adjacent to Pine Creek and crosses the creek several times putting the health of the stream and its riparian area at risk. There was relatively little grass or grass like plants in the area (only 8.4%), although dandelion was a common forb found in the area.

Grass/Grasslike Utilization: September 2, 2010												
	Kentucky Bluegrass (*Poa pratensis)*				**Other Grasses**				**Sedges and/or Rushes**			
Graminoids	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts
	5.0	3.5	15.0	0.7	10.3	4.2	N/A	0.0	14.0	0.7	N/A	0.0
Other	**Forb**	11	**Bare**	40	**Rock**	1	**Litter**	38	**Lichen, moss, biological crust**			0

(2011) Bare ground continues to predominate. Starting in 2011, we are assessing ground cover beneath plants in order to assess the true potential for sheet erosion. This makes possible a total ground cover of >100%. In July, forbs provided 55% cover; in September, 5%. Bare ground slightly increased from 51% (July) to 57% (Sept). This dramatic change in forb presence, but fair stability in bare ground highlights the importance of measuring ground cover beneath plants which can be present or absent, depending on the month of measurement or the year's precipitation.

Grass/Grasslike Utilization: July 5, 2011												
	Kentucky Bluegrass (*Poa pratensis)*				**Other Grasses**				**Sedges and/or Rushes**			
Graminoids	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts
	15.5	2	N/A		10.6	8	N/A	N/A	N/A	N/A	N/A	N/A
Other	**Forb**	55	**Bare**	51	**Rock**	2	**Litter**	46	**Lichen, moss, biological crust, water**			1

Grass/Grasslike Utilization: Oct. 21, 2011												
	Kentucky Bluegrass (*Poa pratensis)*				**Other Grasses**				**Sedges and/or Rushes**			
Graminoids	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts	Ave. ht(in) Access-ible	% pts	Ave. ht(in) Not Access-ible	% pts
	6.6	8	N/A	N/A	N/A	N/A	N/A	N/a	N/A	N/A	N/A	N/A
Other	**Forb**	5	**Bare**	57	**Rock**	1	**Litter**	42	**Lichen, moss, biological crust, water**			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. Kentucky bluegrass (KBG) was recorded separately from other grasses, as a Fishlake NF stubble height standard of 1.5" is applied to KBG rather than 4" for other hydric grass/grasslike species.[1]

[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

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 or under a shrub.

2009 method changes: In 2009, plants or ground cover were recorded on five point-intercept transects (the same transects used as belt transects for browse/height of cottonwood/aspen/willow). The five point-intercept transects at each site were extended only as far back from the bank as the last cottonwood or 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., a grass with a droop height of 3" and a blade length of 17" would be noted and described in a footnote to the graminoid chart.

2010 method change: Per a request from the USFS, the main transect was lengthened to 180' (in comparison to a 100' transect in previous years) to capture more of the meadow. The five perpendicular transects for graminoid utilization and willow browse were then set at 36' apart.

2011 method change: Ground cover beneath plants is now being assessed, resulting in a potential of >100%.

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