

## **Pine Creek/Sulphurbeds Allotment**

### **Riparian Permanent Range Cage**

Established May 21, 2009

Little North Creek

This 16' X 16' permanent range cage is located on the riparian narrowleaf cottonwood site of the 2008 Little North Creek #5 (LNC5) riparian browse transect (Grand Canyon Trust). It is a short distance west of where FR 118 crosses Little North Creek.<sup>1</sup> Little North Creek runs roughly southeast to northwest on the western boundary of the Pine Creek/Sulphurbeds Allotment.

The cottonwoods on the site have been heavily browsed, and the riparian area contains much bare soil (Fig.2)

On May 21, 2009, Grand Canyon Trust photographed each narrowleaf cottonwood within the enclosure for a record. No detailed record of all species within the enclosure has been established.

On October 7, 2009, Grand Canyon Trust read one point-intercept transect running N-S from the middle of the transect, recording the top layer (whether forb, grass, bare soil, rock, etc.) every 4". In addition, the height and browse condition of the top leader and all subleaders within 6 vertical inches of the top leader of each cottonwood <6' was recorded.

The outside comparison to this permanent riparian range cage is the Little North Creek #3 (LNC3) riparian narrowleaf cottonwood transect first established on May 8, 2008, re-read Oct 8, 2008, and again on October 7, 2009, the same day the transects within this range cage was read. At LNC3, five transects perpendicular to the creek at 20' intervals ran from the creek to the last cottonwood or 100', whichever is shorter. The height and species or genus of each plant and ground cover intercepted along the transect were read on the transect every 2'; the height and leader/subleader browse on all cottonwood within each 6'-wide belt transect were recorded.

Both the range cage and LNC3 are situated on the north bank of Little North Creek. LNC3 is approximately 0.22 miles NW of the permanent range cage (Fig. 1). The reason for the separation in distance is the scattered nature of cottonwood openings in the Gambel oak/bigtooth maple forest along Little North Creek.

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<sup>1</sup> 2008 LNC5 report available at

[http://www.grandcanyontrust.org/documents/riparian\\_transects/flnf\\_beaverrd\\_caw\\_littlenorthcreek3\\_100808.pdf](http://www.grandcanyontrust.org/documents/riparian_transects/flnf_beaverrd_caw_littlenorthcreek3_100808.pdf)

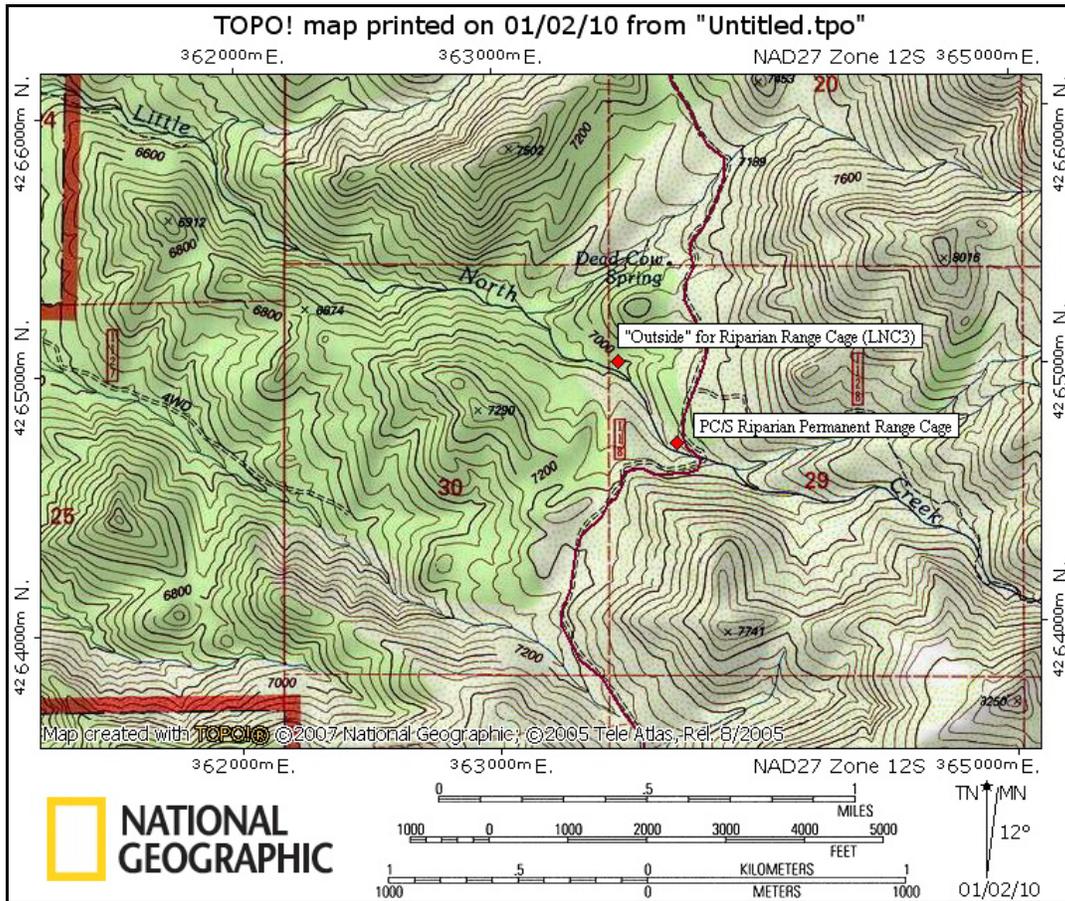


Fig. 1 Location of PC/S Riparian Permanent Range Cage and Outside Comparison

<b>Pine Creek/Sulphurbeds Riparian Permanent Range Cage</b>	<b>Established</b> May 21, 2009
Fishlake NF/Beaver RD	<b>Allotment:</b> Pine Creek/Sulphurbeds <b>Pasture:</b> Little North Creek
<b>Range Cage Location:</b> (NAD CONUS 27)  12N 0363722E 4264677N	<b>Outside Comparison Location</b>  (Little North Creek #3) 12N 0363475E 4265011N
<b>Aspect:</b> Southwest <b>Elevation:</b> 7,147'	<b>Ave. Width of Riparian Area:</b> 60'
<b>Transect readings:</b> October 7, 2009 surveyors: Hoskisson/Chilcoat	
<b>Dominant Vegetation at range cage:</b> Narrowleaf cottonwood ( <i>Populus angustifolia</i> ), Gambel oak, bigtooth maple, ballhead waterleaf ( <i>Hydrophyllum capitatum</i> ), <i>Astragalus</i> sp., Utah juniper, Wood's rose, arrowleaf balsamroot, some sagebrush, much bare ground.	
<b>Dominant vegetation at outside comparison location:</b> Narrowleaf cottonwood, big tooth maple, Gambel's oak, ballhead waterleaf ( <i>Hydrophyllum capitatum</i> ), Asteraceae sp., <i>Astragalus</i> , bunchgrass sp., Kentucky bluegrass, juniper, Wood's rose, chokecherry	
<b>Other notes:</b> Cottonwoods extend to the base of the canyon slope at the range cage.	

The **riparian range cage** is within reach A20-9 described in the 2003 Level II Riparian Inventory of the Little North Creek Area by Shell Valley Consulting (Petty, 2003). The **outside comparison** is near the division of reaches A20-7 and A20-8 described in the same riparian inventory

**Relevant to both sites**, the report states: (1) “The mean Pfankuch (1978) stream score was measured at 92.8, which is considered “fair”, although some of the reaches were rated as “poor”, using the adaptation of the Pfankuch rating to Rosgen’s stream type classification. The stream in these sections is suffering from the impacts of heavy grazing on the riparian areas. This results in low bank vegetation cover and vigor, mass wasting of the upper banks and bank cutting. These problems were considerable in reaches A20-1 through A20-3 and A20-6, A20-7, A20-11 and A20-12.”

(2) “Reaches **A10-6 through A20-10** are Mollisols. Areas of higher soil structure and organic matter were identified as Mollisols, however, due to compaction and loss of organic matter cycling the soils are losing structure. This is primarily due to cattle grazing.”

(3) “The lower and middle reaches show the impacts of continuous grazing, which were evident from the measured stubble height in the riparian of 1-3 inches, in reaches A20-8 and A20-12. . . Most of these measurements were made on Kentucky bluegrass and tufted hairgrass. Also documented were large barren areas **in reaches below A20-12** where cattle have removed all of the vegetation.”

The report recommended, “Better grazing management is needed on this st[r]eam as many areas are showing grazing over use. The cattle are confined to the riparian area in this watershed, as shrub growth is so heavy in the uplands that cattle cannot use them. Therefore, cattle spend most of their time on the riparian.”



Fig. 2 (05/21/09) SW diagonal to NE. Note bare ground; browsed cottonwood.



Fig. 3 (05/21/09) Grand Canyon Trust retains a photographic record for each cottonwood in the enclosure on 5/21/09. This cottonwood is in the SE quadrant of the enclosure.

## **Transect Readings**

### **(1) October 7, 2009**

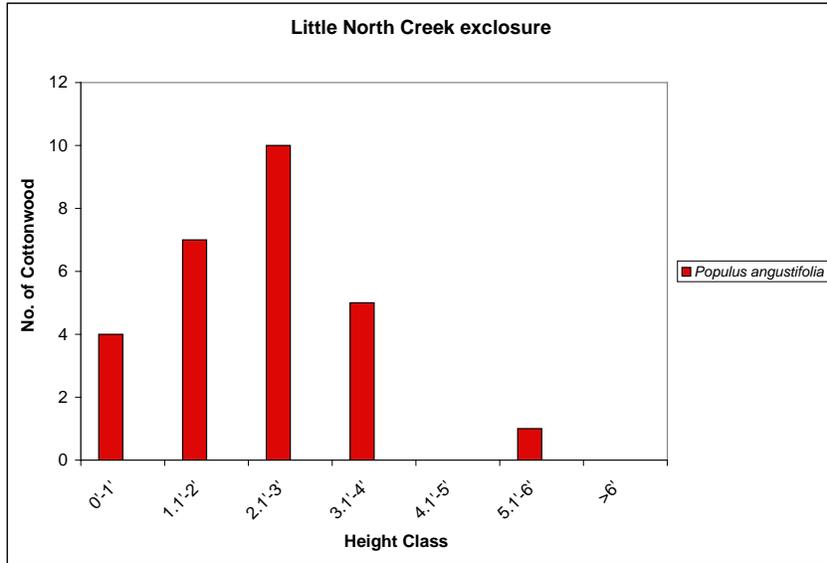
**[2009]** The height distribution of cottonwoods <6' tall is similar between the permanent range cage and the outside comparison (LNC3). However, the browse condition is quite different, with the riparian range cage exhibiting 33% browse of leaders (presumably prior to fencing on May 21, 2009) and the outside comparison exhibiting 75% browse. Subleader browse is 52% inside the range cage; 84% outside.

The number of subleaders within 6 vertical inches of the leader is slightly to moderately less within the range cage (e.g., 5 subleaders within the 2.1'-3' height class inside the range cage versus 7 subleaders for the same height class outside). The difference would be expected to be more pronounced in coming years.

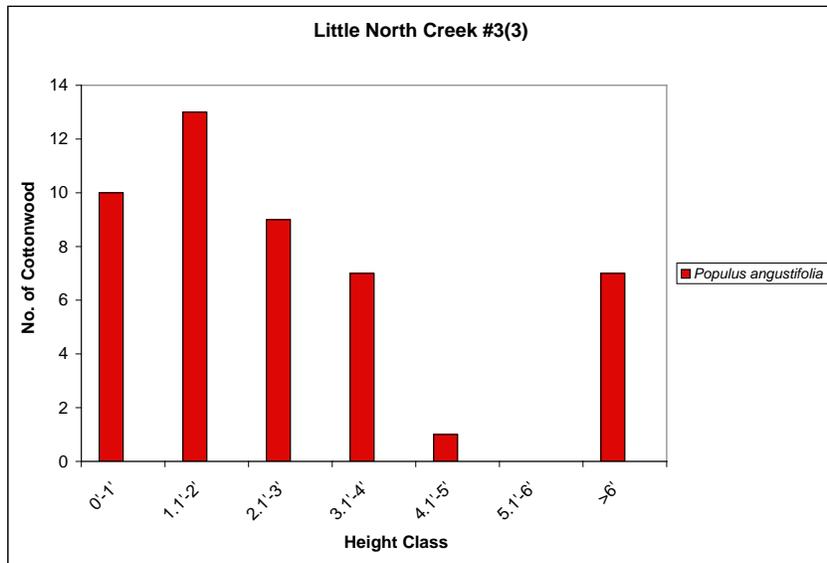
The riparian range cage site is largely denuded of vegetation (Figs. 2-3), with bare ground (49%) and litter comprising 92% of the ground cover. It will be of interest to learn the rate of recovery of graminoids and forbs in this riparian area. The comparison (LNC3) site had 21% graminoid and 1% forb cover as of October 7, with Kentucky bluegrass averaging 1.9" height and other grasses 3.4" (Table, p. 9; Fig. 8). A *Poa secunda* plant within the enclosure was >6" tall (Fig. 5).

# Height Distribution

## Riparian Range Cage October 7, 2009



## Outside Comparison: Little North Creek #3 October 7, 2009



## Browse

### Riparian Range Cage October 7, 2009

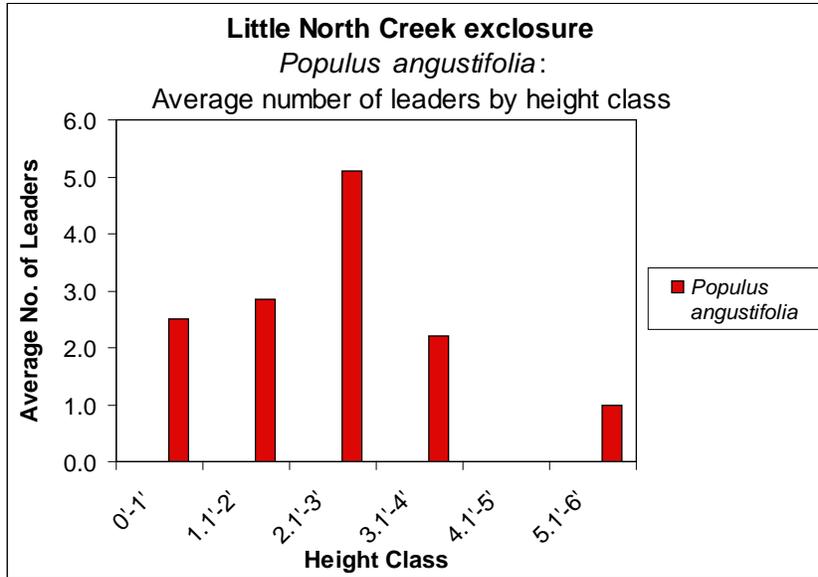
Little North Creek Exclosure	
27 <i>Populus angustifolia</i> <6'	
No <i>Populus angustifolia</i> >6'	
	<i>Populus angustifolia</i>
% tall leaders browsed	33.3
% tall leaders browsed or dead	33.3
% subleaders browsed	51.5
% subleaders browsed or dead	51.5

### Outside Comparison: Little North Creek #3 October 7, 2009

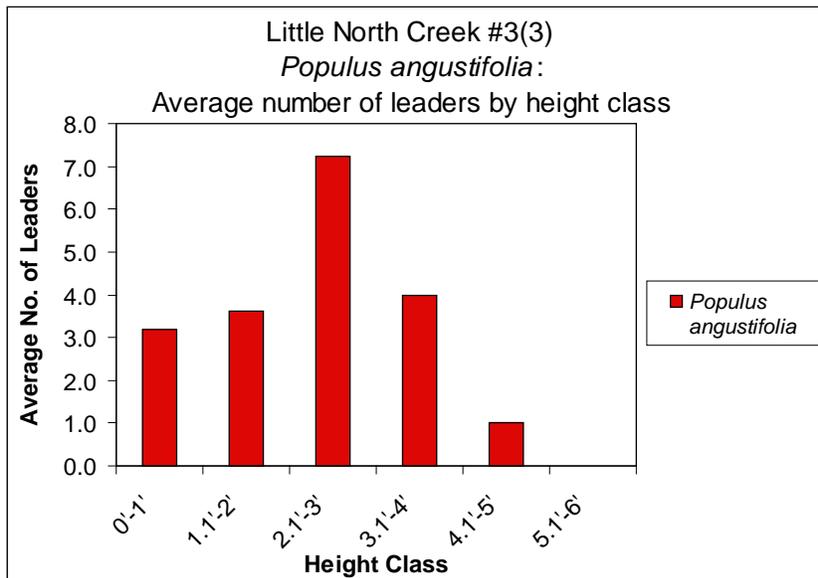
Little North Creek 3(3)	
40 <i>Populus angustifolia</i> <6'	
7 <i>Populus angustifolia</i> >6': Ave. DBH 9.1"	
	<i>Populus angustifolia</i>
% tall leaders browsed	75.0
% tall leaders browsed or dead	75.0
% subleaders browsed	83.5
% subleaders browsed or dead	83.5

### Number of Leaders by Height Class

Riparian Range Cage  
October 7, 2009



Outside Comparison: Little North Creek #3  
October 7, 2009



## Understory/Ground Cover

### Riparian Range Cage October 7, 2009

Plants:	Cover (%)	# Species	Height (in.) (average)	Two most common species
Tree	0			
Shrub	0			
<i>Poa pratensis</i>	0			
Other Grass	2	1	5	<i>Poa secunda</i>
Grass-like Plant	0			
Forb	2	1	4	<i>Erigeron</i> sp.
<b>Totals:</b>	4	2		
Non-plant Cover %:	Bare	Rock	Litter	Lichen, moss, biological crust
	49	4	43	0

### Outside Comparison: Little North Creek #3 October 7, 2009

Grass/Grasslike Utilization: October 7, 2009												
Graminoids	Kentucky Bluegrass ( <i>Poa pratensis</i> )				Other Grasses				Sedges and/or Rushes			
	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
	1.9	4	4.0	2	3.4	10	4.1	5	-		-	
<b>Other</b>	<b>Forb</b>	1	<b>Bare</b>	18	<b>Rock</b>	1	<b>Litter</b>	59	<b>Lichen, moss, biological crust</b>			0

## Reference

Petty, Jeff. 2003. Fishlake National Forest 2003 Level II Riparian Inventory: Little North Creek Area. Shell, WY: Shell Valley Consulting.



Fig. 4 (10/07/09) Cottonwood reaching 6' within range cage



Fig. 5 (10/07/09) Grass inside the range cage



Fig. 6 (10/07/09) This type of photo can be repeated in coming years. Northwest corner of range cage looking south.



Fig. 7 (10/07/09) Browsed cottonwood outside comparison (LNC3)



Fig. 8 (10/07/09) Sedge stubble at 1.5", outside comparison site