

Little Blue River, Kansas: Over Nine Miles of River Stabilization & 166 Acres of Riparian Corridor Establishment

**By Phil Balch, with a little
help from Dave Derrick**



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Bank pins were installed at 12 sites in April 2000 to determine the migration rates of the river.



The rebar is driven into the bank until the end is flush with the face of the bank.



*Bank erosion pins both
horizontal & vertical*

10 8 '97

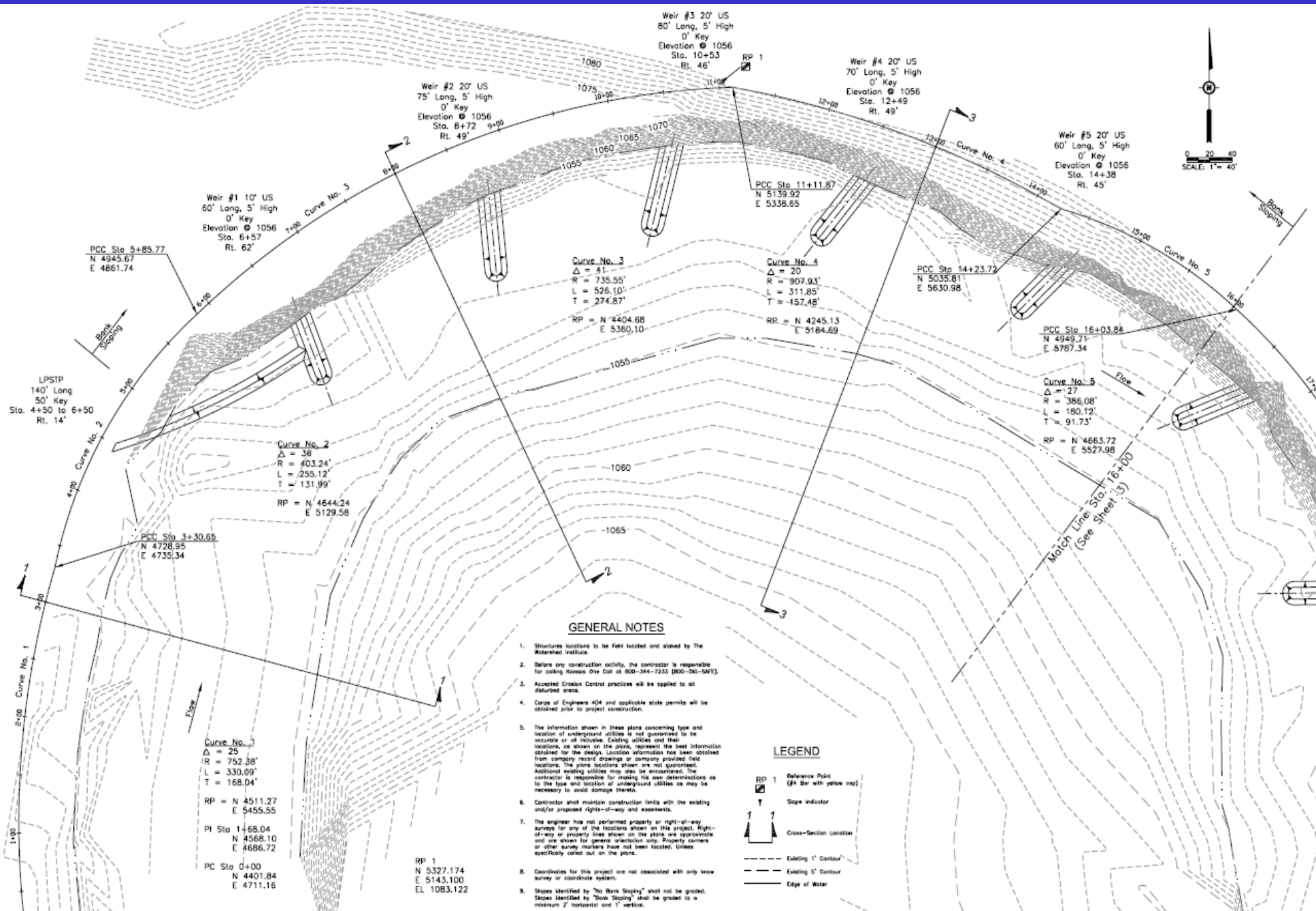


**21 ft of lateral
migration in
one month!**

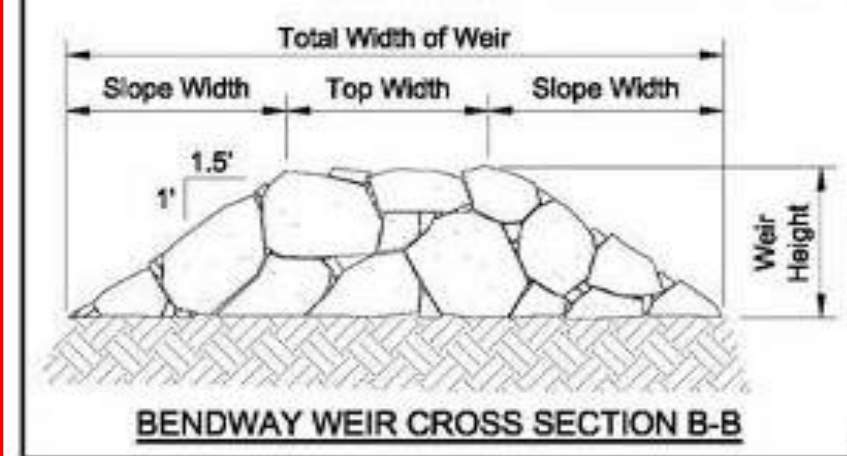
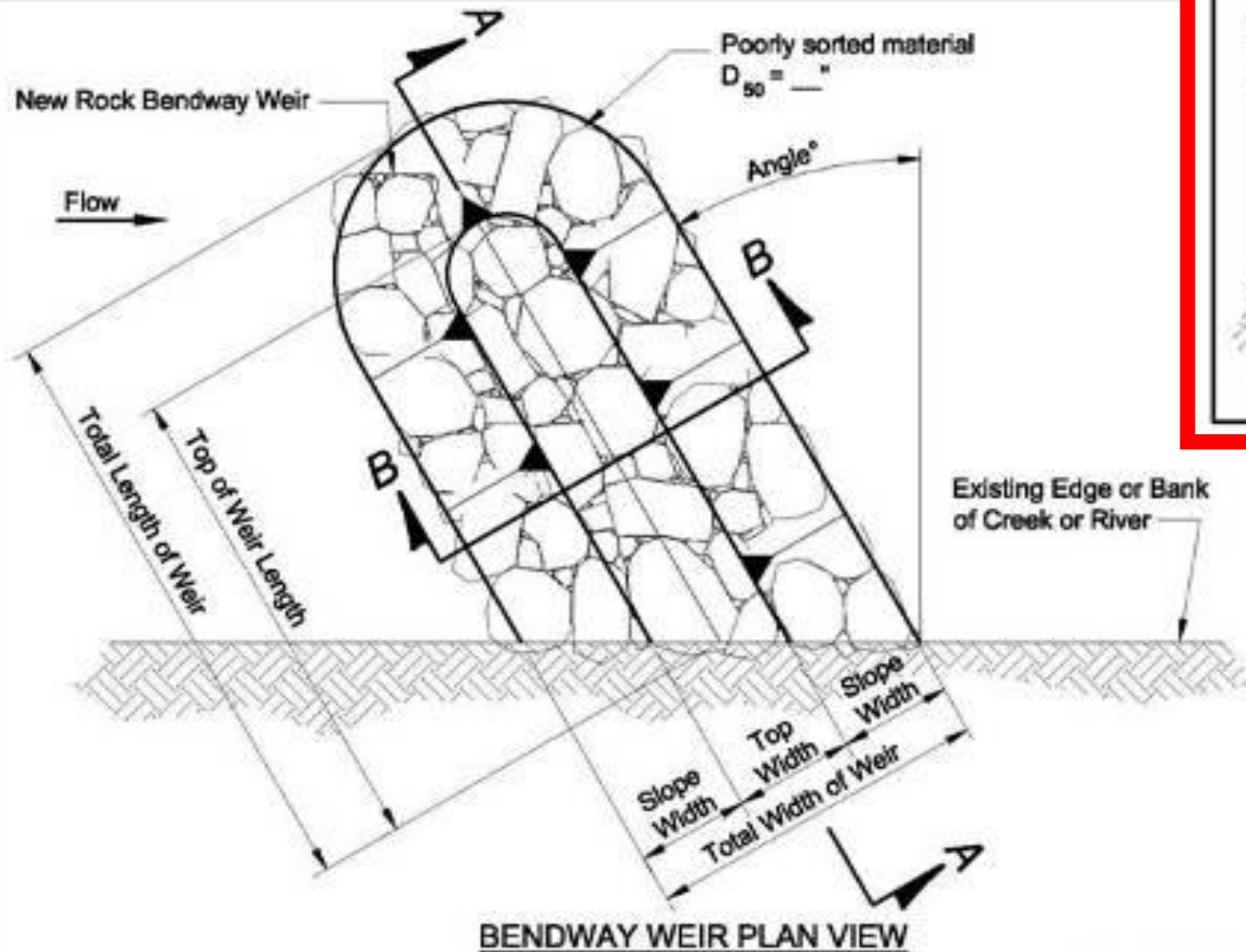
**Stake was
placed 25 ft
from breaking
edge of top
bank one
month ago**

Travelute Site

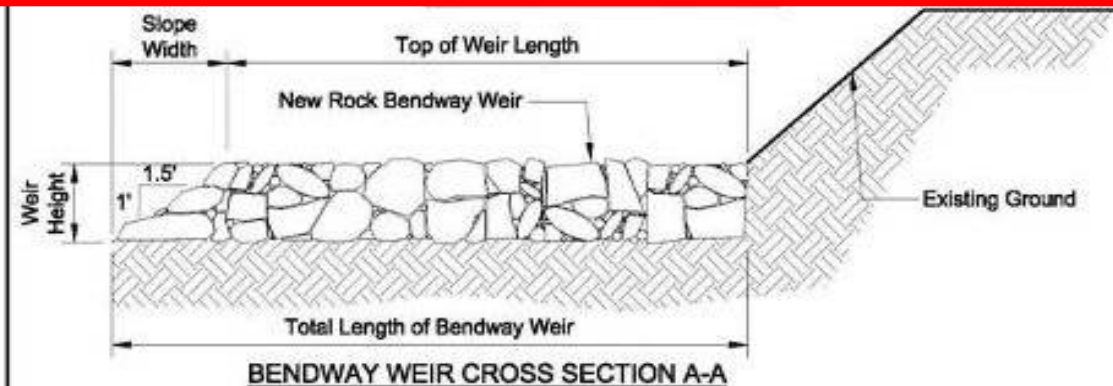
Plans & specs were developed for each site, typical Bendway Weir layout shown



Project No.	10099
Client	THE WATERSHED
Owner	GEARY COUNTY, KANSAS
Restored Institute	1200 SW Executive Dr., Topeka, Kansas 66615 • 785-372-2252
Site	SITE 2
Plan	PLAN SHEET
Sheet	2 OF 9



Detailed P & S for Bendway Weirs



Little Blue River Hanover, KS.

Hennerberg Site

Built January 2002

An aerial photograph of a river bend. A red line is drawn along the outer bank of the bend, indicating the path of lateral migration. Three yellow arrows point to specific locations along this red line: one at the top of the bend, one further down, and one at the bottom. The surrounding landscape is a mix of fields and trees.

Little Blue River

Site # 1 Hennerberg

Rosgen Stream Type = C4c

**Lateral Migration (Erosion) from
March 2000 to August 2001 = 205 ft.**

Amount of soil loss = 231,200 tons

**Nutrient Content = 1,110 Lbs. NO₃,
4,162 Lbs. P, 13,400 Lbs K**

**Volumes contributed to stream from 3/2000 to
8/2001 - 17 months (without a big flood!!)**

231,200 Tons Sediment

1,110 Lbs. NO₃

4,162 Lbs. P

13,400 Lbs K



#1 - Hennerberg Site

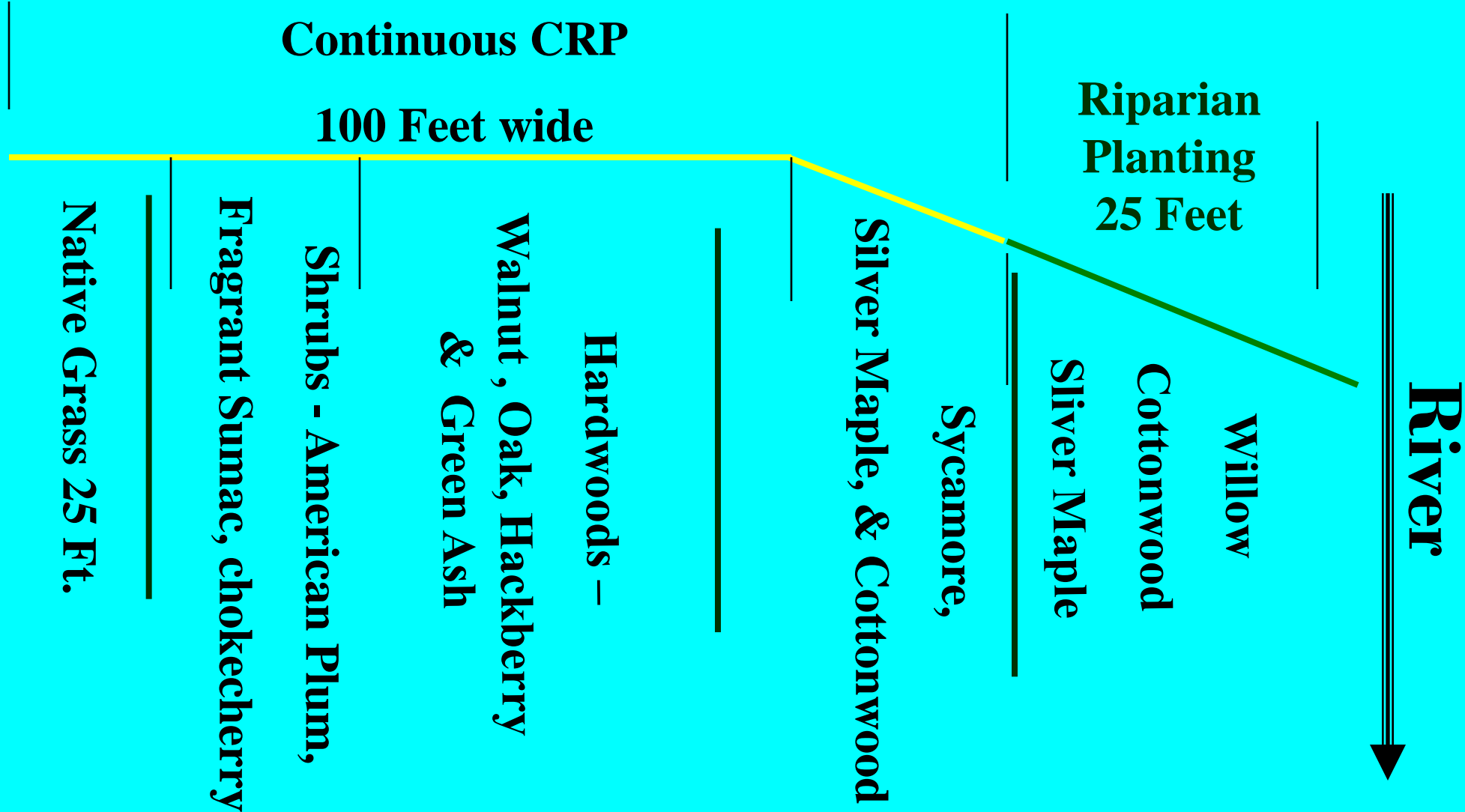
**Hennerberg Project, Little Blue River, Bendway Weirs
constructed, bank laid back, no plantings or seeding yet.
January 2002**



**Site # 1 - Hennerberg – March 2002 – Bendway
Weirs built, bank sloped & seeded.**



Little Blue River Tree & Shrub Planting





Site # 1 – Hennerberg - As part of a Kansas State University research project, every 3rd hardwood tree was placed in a tree shelter. Even with a severe drought, the seedlings in shelters out-performed those without a shelter. This picture was taken 5 months after planting.

Site # 1 - Hennerberg 6/24/2003 – 42,000 + cfs flood



Bendway Weirs at the Hennerberg Site, Little Blue River. Looking Downstream after 2 Growing Seasons



5 4:09 PM

Looking DS. 7 years after construction. Full-sized
people, big riparian trees!



Pix by phil balch

10 YEARS LATER
LITTLE BLUE RIVER
HENNERBERG SITE
PIX BY DERRICK
JULY 20, 2012

10 YEARS LATER-Looking DS @ fantastic riparian, stable bank & diversity & complexity within the river channel. Great job Phil!!!!



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Looking @ the herbaceous filter strip (field side of riparian corridor). Excellent growth intercepts nutrients & pesticides



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Looking DS @ rows of different species have all grown well. Providing stability, riparian functions & roughness during floods



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Sycamore growth is outstanding!



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Understory & overstory both robust!!



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

**10 YEARS LATER-Great
growth of several species.**



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Dense native plum grow shades out understory



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

10 YEARS LATER-Tall dense veg provides screening, less dense veg provides movement corridors for wildlife (deer trail) .



10 YEARS LATER-LTL BLUE R-HENNERBERG SITE- DERRICK-7/20/2012

***FISH COMMUNITY
RESPONSE TO BENDWAY
WEIR INSTALLATION AT
TWO SITES ON THE
LITTLE BLUE RIVER, KS. 5
YEARS AFTER
CONSTRUCTION.***

FISH COMMUNITY CHANGES AT TWO BENDWAY WEIR STREAMBANK STABILIZATION PROJECTS ,5 YEARS AFTER CONSTRUCTION ON THE LITTLE BLUE RIVER, KS.



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Pre-Bendway Weir 2001

**Mini case study: 1 of 3
John Hynek Site**



SPECIES	Number	CPUE
Longnose gar	4	5.71
River carpsucker	1	1.43
Channel catfish	6	8.57
Common carp	4	5.71
Red shiner	22	31.43
Gizzard shad	1	1.43
Freshwater drum	1	1.43

7 Species, 39 Individuals

1,150 feet long, 20' vertical banks

**Soil loss 1977 – 2000 = 12.7 acres
(491,744 tons)**

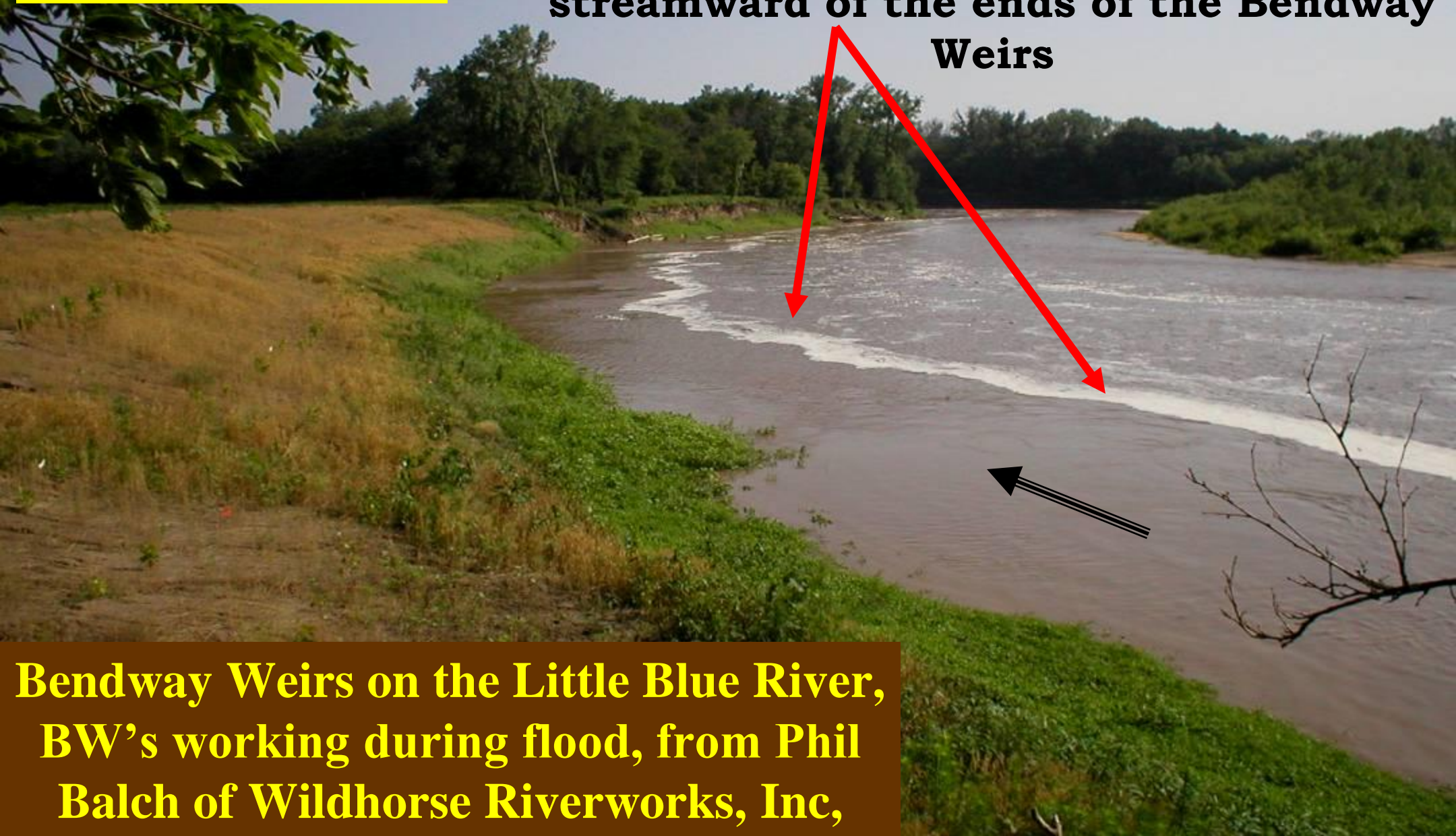
Nitrates = 2,046 lbs

Phosphorus = 18,686 lbs

Potassium = 54,800 lbs

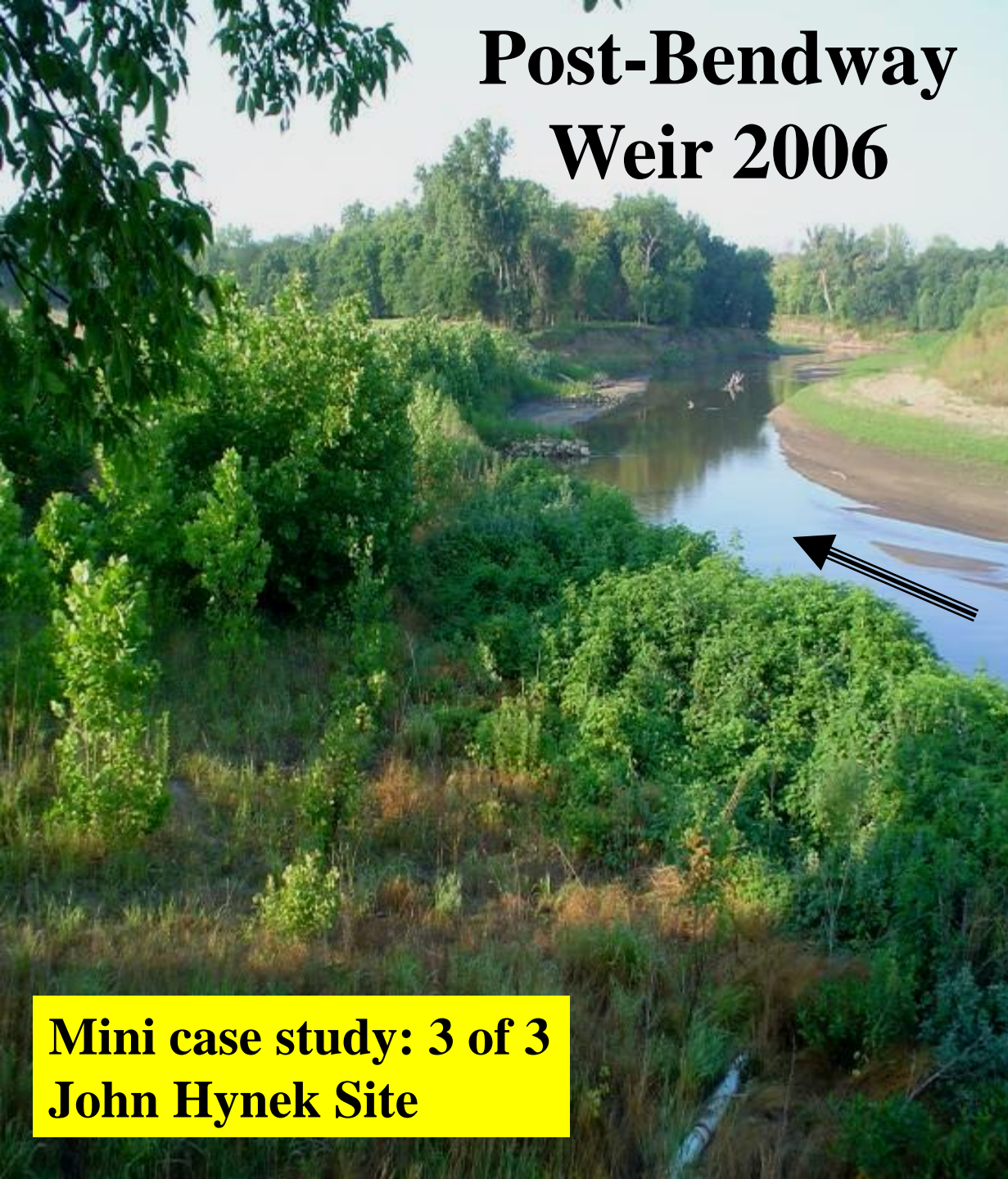
**Mini case study: 2 of 3
John Hynek Site**

**Looking DS with the river rising on a
32,000 cfs flood. Note thalweg is
streamward of the ends of the Bendway
Weirs**



**Bendway Weirs on the Little Blue River,
BW's working during flood, from Phil
Balch of Wildhorse Riverworks, Inc,**

Post-Bendway Weir 2006



**Mini case study: 3 of 3
John Hynek Site**

SPECIES	Number	CPUE
Longnose gar	1	1.1
River carpsucker	54	60.0
Channel catfish	39	43.3
Common carp	14	15.6
Red shiner	533	592.2
Gizzard shad	342	380.0
Flathead catfish	7	7.8
Smallmouth buffalo	1	1.1
Suckermouth minnow	33	36.7
Bluntnose minnow	10	11.1
Emerald shiner	22	24.4
Sand shiner	208	231.1
Bullhead minnow	149	165.6
Mosquitofish	6	6.7
Orangespotted sunfish	4	4.4
Green sunfish	3	3.3
Freshwater drum	7	7.8

17 Species, 1,433 Individuals

SITE 2: Pre-Project

2,000 feet long

16' vertical banks

**Soil loss 1977 – 2000 =
14.9 acres (461,542 tons)**

Nitrates = 5,539 lbs

Phosphorus = 36,000 lbs

Potassium = 138,463 lbs

SPECIES	Number	CPUE
Longnose gar	1	1.16
River carpsucker	3	3.49
Channel catfish	1	1.16
Common carp	1	1.16
Smallmouth buffalo	1	1.16
5 Species, 7 Individuals		

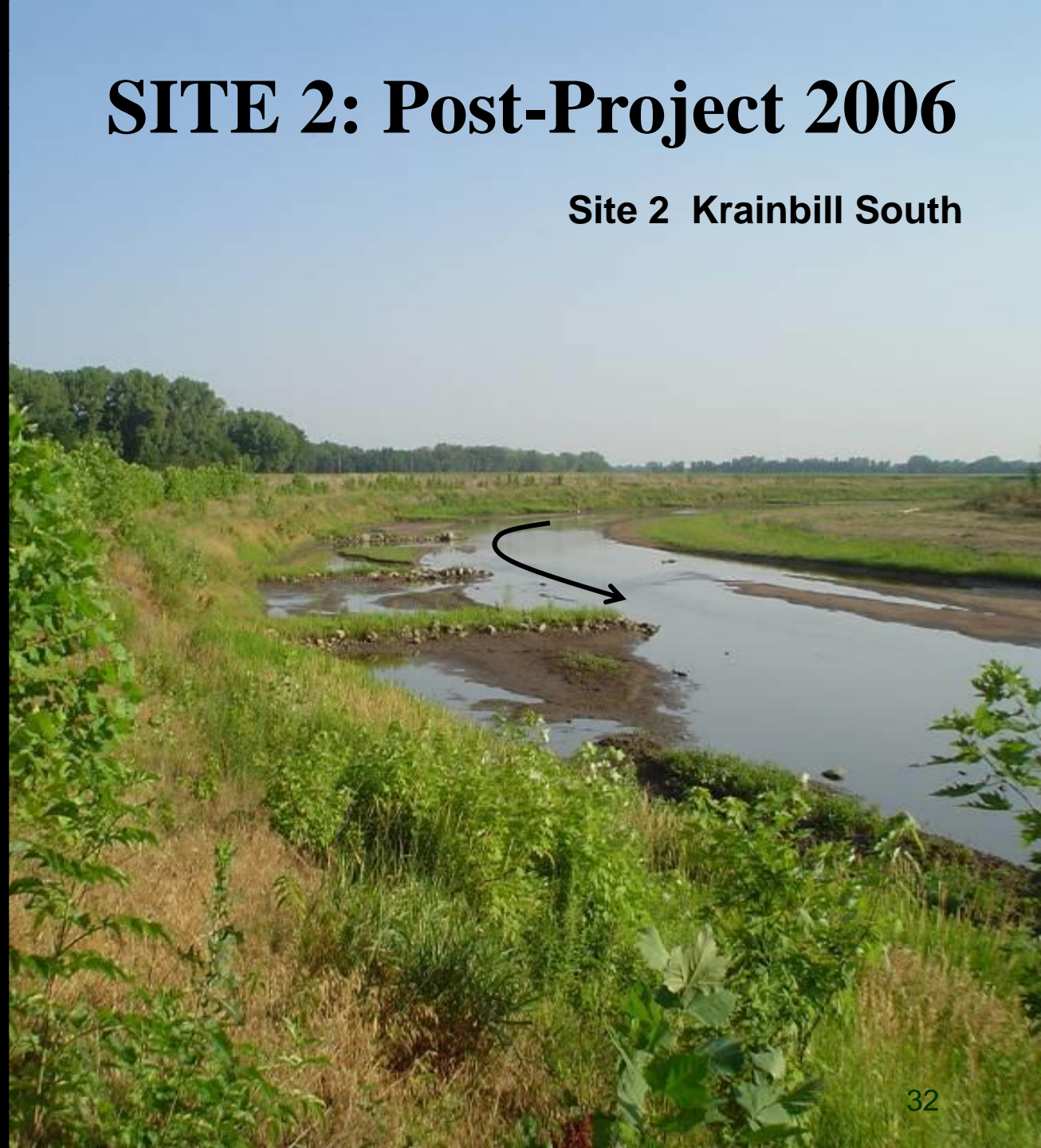
Site 2 Krainbill South

SPECIES	Number	CPUE
Longnose gar	6	5.8
River carpsucker	57	54.8
Channel catfish	47	45.2
Common carp	21	20.2
Flathead catfish	17	7.8
Freshwater drum	6	5.8
Quillback	12	11.5
Gizzard shad	145	139.4
Fathead minnow	1	0.9
Suckermouth minnow	42	40.4
Emerald shiner	32	30.8
Sand shiner	185	177.9
Red shiner	827	795.2
Bluntnose minnow	2	1.9
Bullhead minnow	295	283.7
Mosquitofish	1	0.9
Bluegill	3	2.9
Orangespotted sunfish	5	4.8

18 Species, 1704 Individuals

SITE 2: Post-Project 2006

Site 2 Krainbill South



9 YEARS LATER-Looking DS close-up of great riparian zone.



9 YEARS LATER-LTL BLUE R-KRAINBILL SITE- DERRICK-7/20/2012

***HEMI WETLAND
(HALF WET – HALF
LAND) CREATION
BETWEEN BENDWAY
WEIRS***

**LITTLE BLUE
RIVER,**

Hanover, KS.

Tina Brenneis Site

Tina Brenneis Site 8-27-2003



Tina Brenneis Site 6-2006 - almost 3 yrs later



**Looking US @ natural
vegetation on deposition
within the Bendway Weir
field**

Wonderful diversity & complexity within the Bendway Weir field (hemi-wetlands). [Republican River](#), Clay County, KS.



Pix by Derrick



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