Wadeable Streams Baseline Monitoring - Arkansaw Creek Subwatershed 2002 Pepin County, Wisconsin.

MWBC : 2055300

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Introduction

The Eau Galle River watershed was sampled during the 2002 field season as part of the WDNR wadeable streams baseline monitoring program. The Arkansaw Creek subwatershed was sampled as part of this monitoring effort. Three sites on the mainstem of Arkansaw Creek were sampled. Coldwater IBI and salmonid relative CPUE were calculated at all sites sampled. Habitat data was not collected due to budget reductions and also due to the fact that it was collected in 1998 during the Eau Galle River Comprehensive Watershed Survey. Arkansaw Creek is currently listed as a Class II trout stream for 7.0 miles WDNR (2002). Historically, Arkansaw Creek was considered a marginal coldwater fishery and was stocked with domestic fingerling brown trout. The most recent survey of Arkansaw Creek occurred in 1998 Swim et al, (2000). This comprehensive watershed survey documented that Arkansaw Creek harbored low densities of brown trout (CPUE ranging from 6 to 60 fish per mile). The 1998 survey also documented that one small un-named tributary stream in the headwaters of Arkansaw Creek contained a healthy brook trout fishery with natural reproduction. Recommendations from the 1998 report included eliminating brown trout stocking and converting all trout stocking practices to feral brook trout fingerlings due to excellent thermal regimes in the headwaters of Arkansaw Creek. Feral brook trout stocking began on Arkansaw Creek in 2001. A complete list of stocking practices over the past 5 years is provided in (Table 1).

Table 1: Stocking Records for Arkansaw Creek, 1998-2002.

Date	Species	Strain	# stocked	Stage
9/09/98	Brown	St.Croix	1500	Fingerling
9/09/99	Brown	St. Croix	1500	Fingerling
9/29/99	Brown	Timber Coulee Feral	1480	Fingerling
6/26/01	Brook	Ash Cr. Feral	5000	Fingerling
6/20/02	Brook	Ash Cr. Feral	5000	Fingerling

Current management goals for the Arkansaw Creek subwatershed are to promote a brook trout fishery with densities approaching 750-1000 brook trout per mile by 2005 as well as eliminating or maintaining the current brown trout fishery at less than 100 fish per mile.

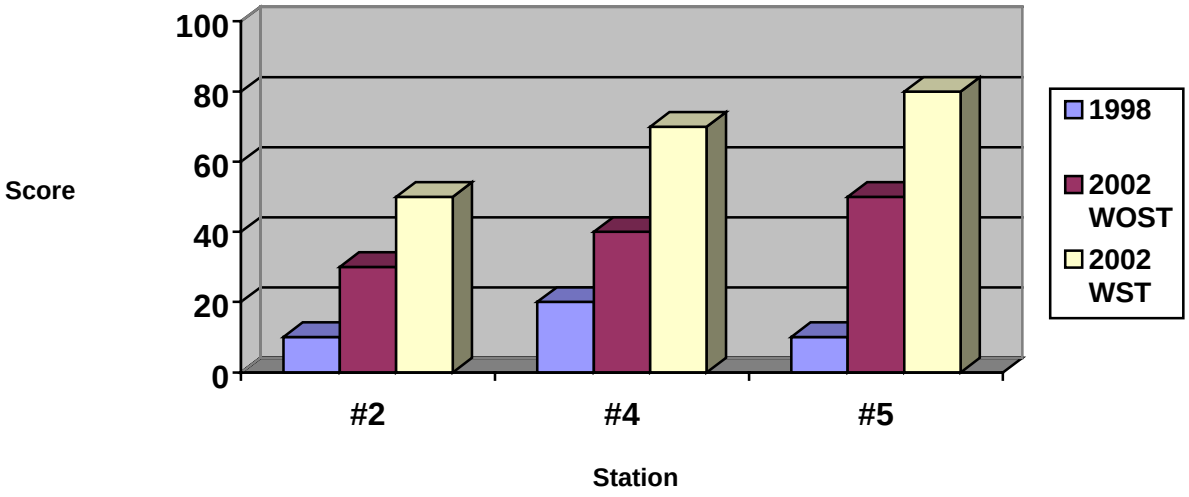
Results and Discussion

Coldwater IBI Ratings

Lyons et al (1996) suggests that stocked salmonids should not be used in the Coldwater IBI calculation. Since feral brook trout have been stocked the past two years and feral brown trout were stocked in 1999, coldwater IBI ratings will be reported with (WST) and without (WOST) stocked trout for the purposes of this report. In addition, for comparision purposes the coldwater IBI scores from the 1998 survey included stocked trout in the coldwater IBI calculation.

Coldwater IBI ratings (WST) scored 50, 70 and 80 and (WOST) scored 30, 40 and 50 at stations #2, #4 and #5 respectively. Overall, coldwater IBI ratings have increased at all sites when compared to the 1998 survey. In 1998, sites #2, #4 and #5 were rated as poor and scored 10, 20 and 10 respectively. The increase in the coldwater IBI ratings is directly related to one primary factor. Coldwater intolerant species such as mottled sculpin, have increased at all sites when compared to the 1998 survey. In addition, very few tolerant fish species were collected at these sites when compared to the 1998 data and the fish assemblage is more reflective of a healthy coldwater fish community.

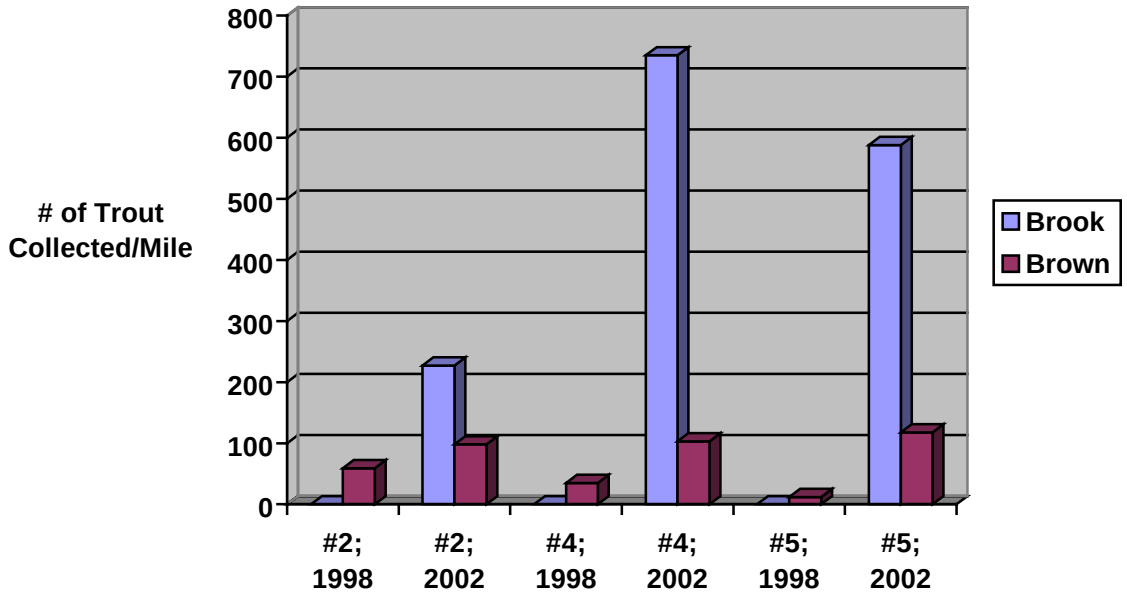
Figure 1: Coldwater IBI ratings, Arkansaw Creek, Sub-Watershed.



Salmonid Relative CPUE

Relative abundance for salmonids is presented in (Figure 2). Brook trout are now the dominant salmonid in the subwatershed. Stocking feral brook fingerlings has resulted in two strong year classes of brook trout and adequate carryover to provide a desirable sport fishery. Brown trout densities are still present in the subwatershed at low levels even though stocking was discontinued in 1999. These fish are likely from the feral brown trout stocking that was done in 1999. There also appears to be low levels of natural reproduction of brown trout at each station sampled. No brown trout natural reproduction was documented in 1998. This information provides evidence that the conversion from domestic strain brown trout to feral brown trout has allowed some natural reproduction to occur at low levels where it has been non-existent in the past.

Figure 2: Salmonid Relative Abundance. Arkansaw Creek Subwatershed: 1998 vs 2002.



It is anticipated that the 2001 year class of feral brook trout currently present in Arkansaw Creek will attempt to spawn during the fall of 2002. Future sampling should document any natural reproduction of brook trout in the subwatershed from the feral brook trout stocking efforts.

Thermal Monitoring

Continuous thermal monitoring was collected using HOBO temperature recorders from July 1-August 23, 2002 set at 30 min intervals at sites #2 and #4 on Arkansaw Creek. Thermal data was also collected at site #2 from the 1998 watershed survey. Overall, thermal conditions have improved in 2002 when compared to 1998 data (Table 2). The improvement in the thermal regime is one likely contributing factor for the improvement in both the coldwater IBI scores as well as the success of the feral brook trout recovery efforts.

Table 2: Continuous Thermal Monitoring-Arkansaw Creek Watershed. 7/1/-8/23/ 2002.

Station	Year	Max	Min	Mean
Arkansaw #2	1998	71.8	55.6	61.3
Arkansaw #2	2002	71.8	51.1	59.5
Arkansaw #4	2002	64.9	51.1	57.2

Management Recommendations:

1. Continue feral brook trout stocking at 5000 spring fingerlings. This is the recommended stocking rate on a per acre basis. Currently brook trout densities are at or near the population goal of 750-1000 brook trout per mile by 2005 after only two years of feral brook trout stocking. It is anticipated that once three year classes are present in the system, brook trout densities will be at or above the population goal. Monitor results on an annual basis until 2005.

2. Eliminate or maintain brown trout densities at less than 100 fish per mile or less than 20% of the total salmonid CPUE on a per mile basis. Currently there are low levels of brown trout reproduction in the subwatershed. This should be monitored to assure that brown trout do not hamper the brook trout recovery efforts.

3. Consider regulation changes for Arkansaw Creek if brown trout densities increase above 100 fish per mile for three consecutive years or if brown trout densities comprise over 20% of the salmonid CPUE for three consecutive years. Currently, Arkansaw Creek is managed by a category 4 trout regulation. The category 4 trout regulation tends to overprotect brown trout when brook trout recovery is the ultimate management goal. A category 5 regulation with an 8 inch size limit on all trout or conversion to a category 3 trout water would likely be the management recommendation.

4. Work with Pepin County LCD, NRCS, Trout Unlimited and the Arkansaw Fur-Fish and Game in an effort to restore the native brook trout fishery on Arkansaw Creek. Restoration efforts should consist of riparian buffers, habitat restoration, nutrient management and flood control efforts.

5. Consider adding portions of Arkansaw Creek to the Stewardship Streambank Protection Program.

Literature Cited

Avery, Nieber and Vetrano 2001. Field Performance of Wild and Domestic Brown Trout Strains in Two Wisconsin Rivers. Wisconsin Department of Natural Resources Research Report 186.

Lyons, Wang and Simonson 1996. Development and Validation of an Index of Biotic Integrity for Coldwater Streams in Wisconsin. North American Journal of Fisheries Management 16:241-256, 1996.

Swim, Engel and Schreiber 2000. Eau Galle River Watershed. Comprehensive Surface Water Report. WDNR, WCR, Lower Chippewa River Basin. Internal Management Report.

WDNR, 2002. Wisconsin Trout Streams. Internal Publication.

Wadeable Streams 2002
Arkansaw Creek Subwatershed
Salmonid Length Distribution

Station Length (ft)	856	856	360	360	360	360
	Station #2	Station #2	Station #4	Station #4	Station #5	Station #5
Inch Range	Brook	Brown	Brook	Brown	Brook	Brown
3.0-3.9	1		9	1	7	5
4.0-4.9	7	3	21		18	
5.0-5.9	22	11	10		5	
6.0-6.9	2	2			1	
7.0-7.9						
8.0-8.9			3		3	
9.0-9.9	1		4		5	
10.0-10.9	1		2		1	1
11.0-11.9			1			
12.0-12.9						2
13.0-13.9				2		
14.0-14.9				2		
15.0-15.9				1		
16.0-16.9						
17.0-17.9						
18.0-18.9				1		
Totals	**34**	**16**	**50**	**7**	**40**	**8**

#/mile-All Sizes	210	99	735	103	588	118
#/mile<4 inches	204	99	132	15	103	74
#/mile>8 inches	12	0	147	88	132	44
#/mile>12 inches	0	0	0	88	0	29

Salmonid Composition Arkansaw Creek Subwatershed 2002

	% CPUE	% CPUE
Station	Brown Trout	Brook Trout
2	32%	68%
4	12%	88%
5	17%	83%