

# The Sugar River: Farmer-Led Stewardship Drives Progress

Mark Riedel – DNR Project Manager

Camille Bruhn – DNR Fish Biologist



Strong Farms  
Local Solutions  
Healthy Soils  
Healthy Waters

# Overview

- 760 sq miles (@ stateline)
- Driftless area - ridge/valley
- Karst
- Impaired surface waters
  - TSS & Phosphorous
- Groundwater nitrates
- Agriculture >80% since mid 1800's
  - Dairy
  - Grain, ethanol

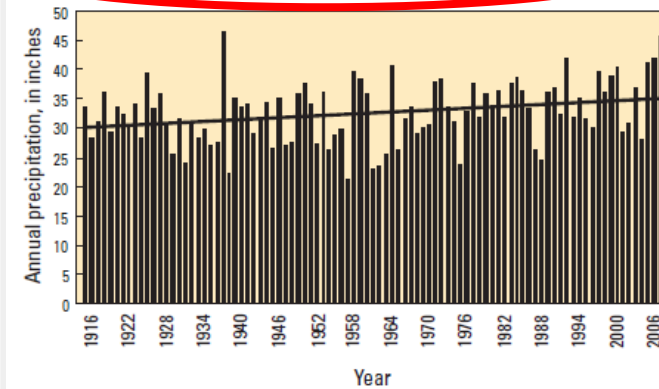


## Changes in Streamflow Characteristics in Wisconsin as Related to Precipitation and Land Use

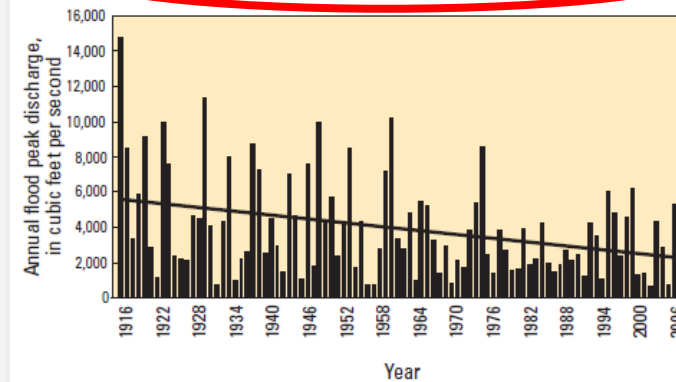


Scientific Investigations Report 2015–5140  
Version 1.1 January 2016

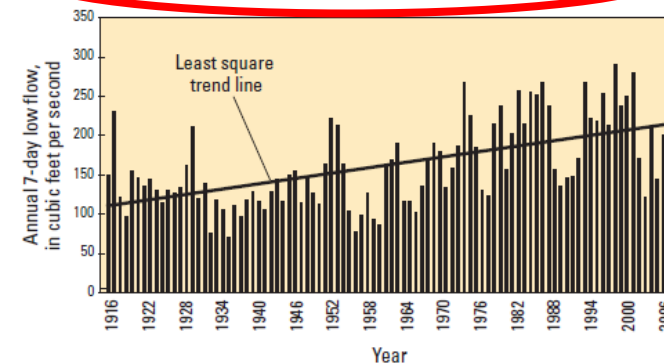
**D. Annual average precipitation for Climatic Division 8**



**C. Annual flood peak discharge for the Sugar River near Brodhead**

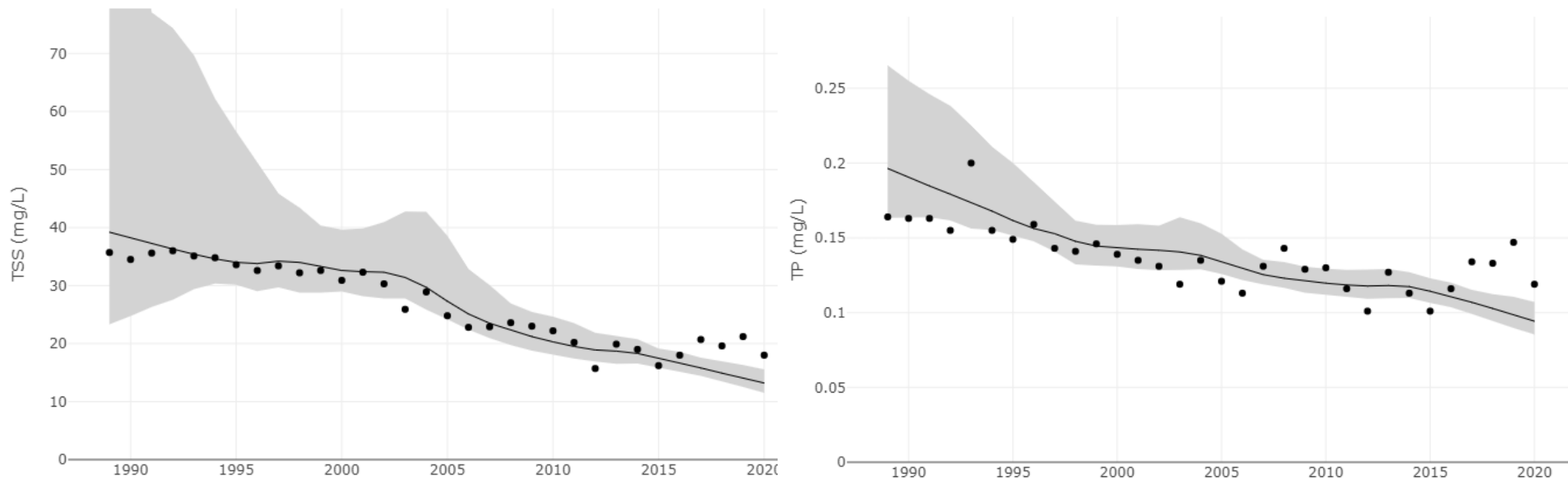


**A. Annual 7-day low flow for the Sugar River near Brodhead**



# Sugar River Sediment and Phosphorus

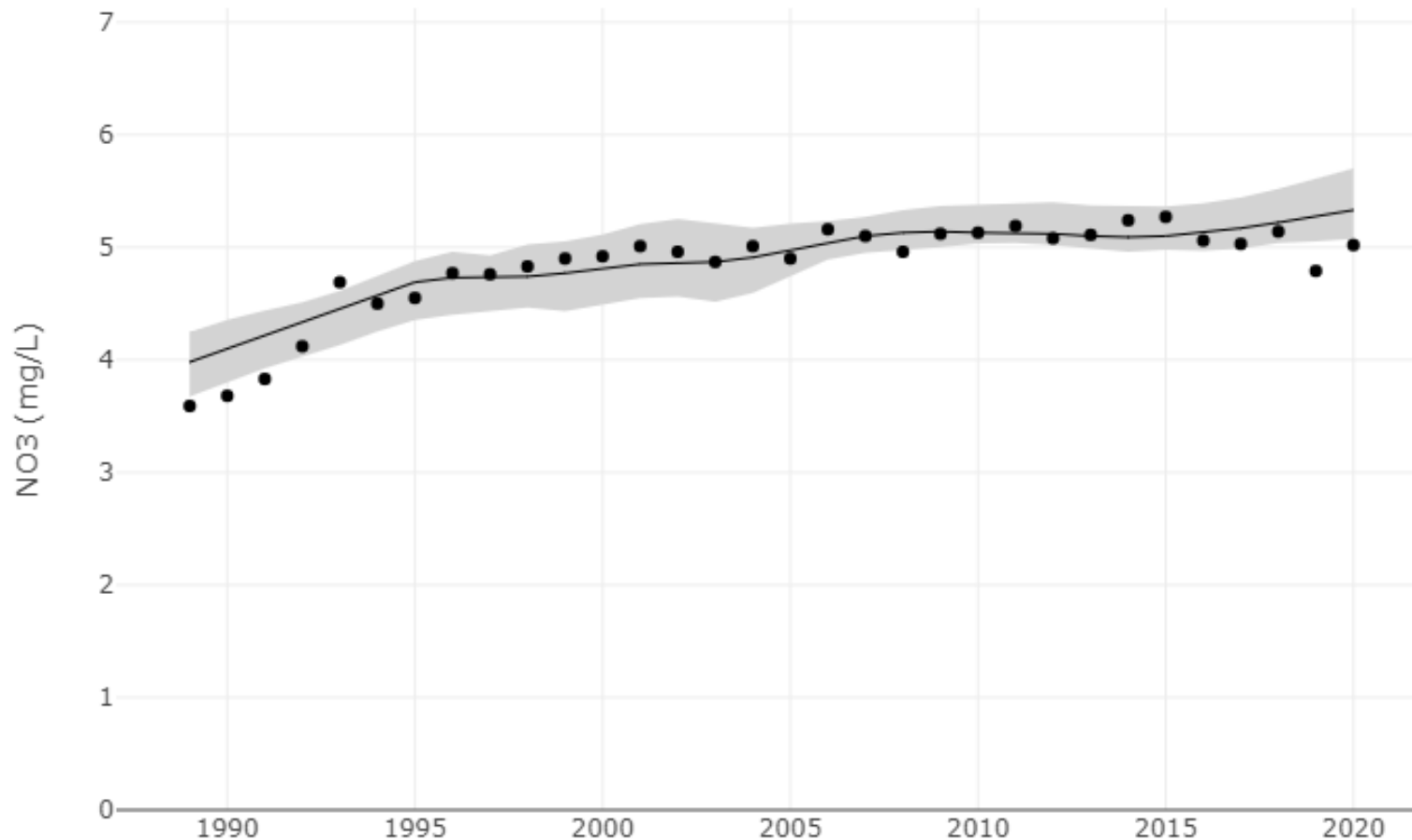
(at Brodhead, 530 square miles)



(points are flow-based estimates – grey bars are 75% intervals on observed data)

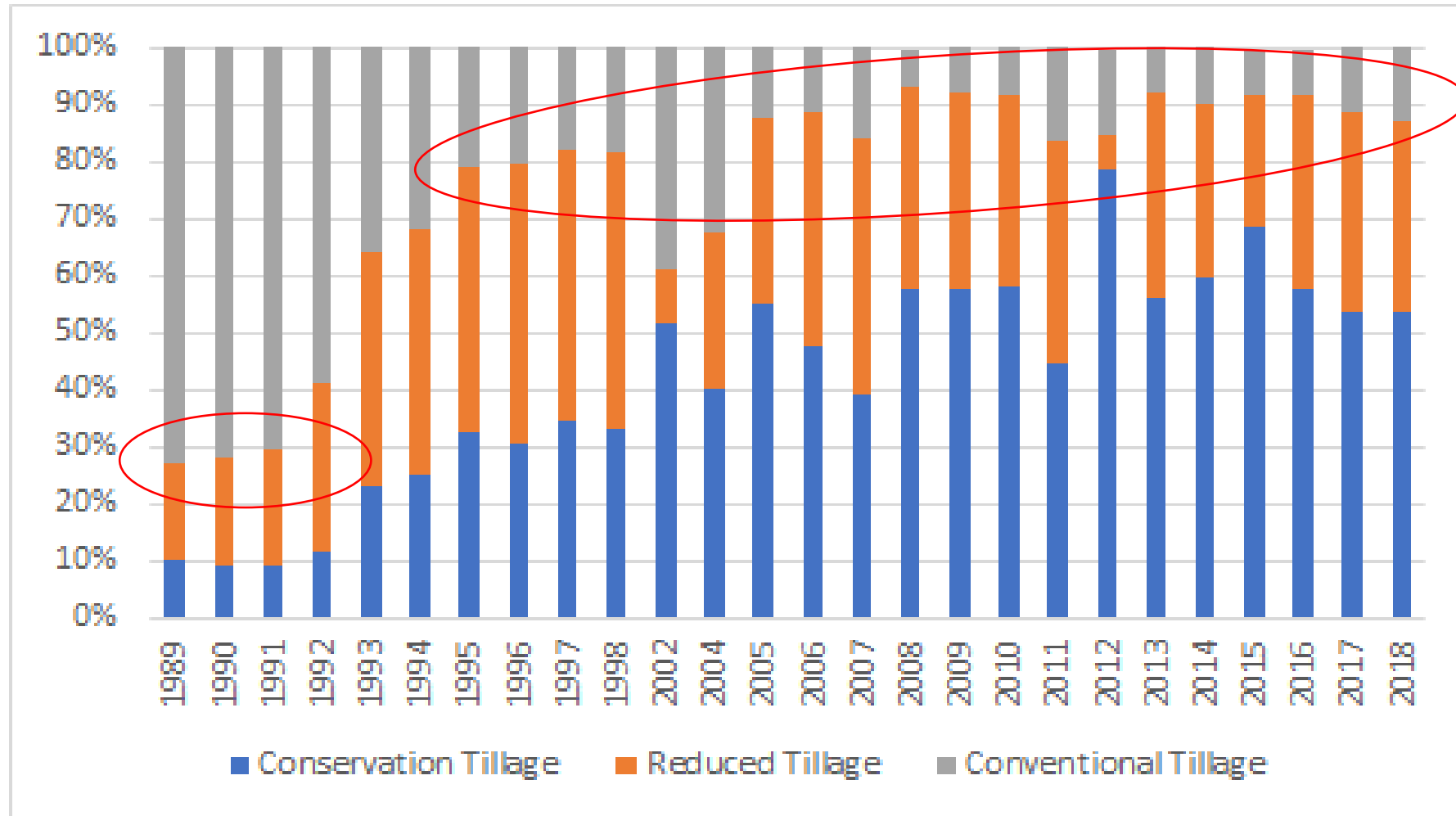
# Sugar River Nitrates

(at Brodhead, 530 square miles)



(points are flow-based estimates – grey bars are 75% intervals on observed data)

# Green County Tillage Trends – Low Disturbance



# Soil Protection – Cover Crops



# Soil Protection – Cover Crops



# Manure Management with Cover Crops



# River Corridor and Waterways

Waterways

River Corridor



# Stream Bank Restoration



# Health of the Sugar River



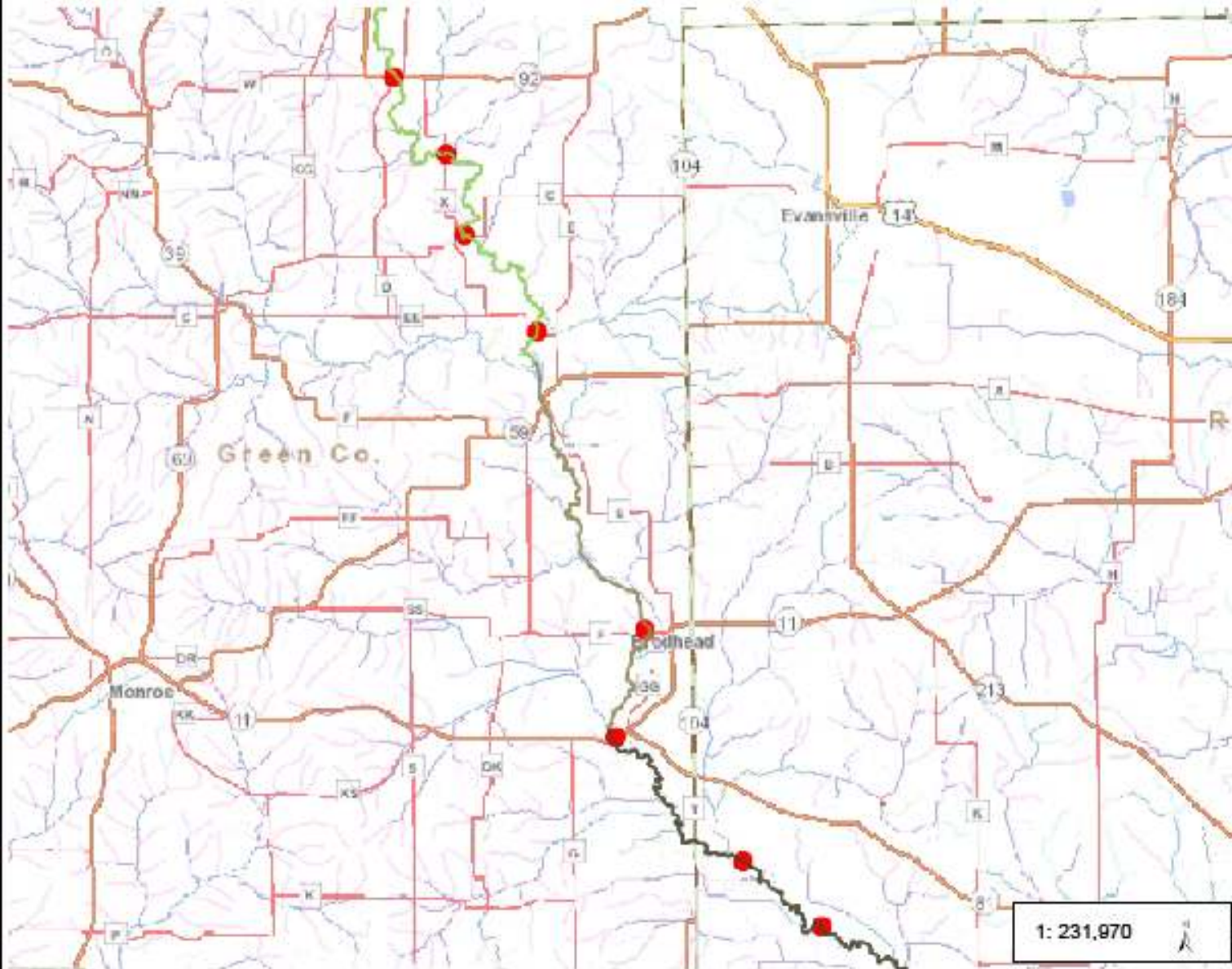
Camille Bruhn

Farmers of the Sugar River Annual Meeting

February 21, 2023



Figure 1: Sugar River Natural Communities and Site Locations



**Legend**

**Streams Natural Communities**

- Coldwater
- Cool-Cold Headwater
- Cool-Cold Mainstem
- Cool-Warm Headwater
- Cool-Warm Mainstem
- Large River
- Macroinvertebrate
- No Classification
- Warm Headwater
- Warm Mainstem

**Major Roads**

- Interstates
- US Highways
- State Highways

**Rivers and Streams**

- Open Water
- Airports

1: 231,970

**Notes**

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/legal/>

# 2014 Survey of the Sugar River Mainstem - Green and Rock Counties

# The mini- boom





**WISCONSIN DEPARTMENT OF NATURAL RESOURCES | [DNR.WI.GOV](http://DNR.WI.GOV)**



**40+** species in  
the SR





34  
total  
species  
in  
these  
surveys



9 Top  
carnivores  
DS of  
Brodhead  
dam, 7 in  
one  
station



## 6 Intolerant Species

John Lyons



[Fish ID](#) | [Wisconsin Sea Grant](#)



# Large River IBI

Metric	Site							
	STH 92	CTH X	CTH C	CTH EE	CTH F	STH 81/11	Beloit- Newark Rd	Nelson Rd
WPUE	87,226 (10)	47,411 (10)	71,445 (10)	59,305 (10)	96,886 (10)	96,239 (10)	52,320 (10)	87,371 (10)
Native spp	10 (0)	12 (5)	9 (0)	11 (0)	19 (10)	18 (10)	16 (10)	15 (5)
Sucker spp	6 (10)	7 (10)	6 (10)	8 (10)	7 (10)	6 (10)	7 (10)	7 (10)
Intolerant spp	2 (5)	2 (5)	2 (5)	3 (10)	2 (5)	5 (10)	3 (10)	3 (10)
Riverine spp	6 (5)	8 (10)	7 (10)	7 (10)	7 (10)	7 (10)	7 (10)	8 (10)
% Riverine (n)	81 (10)	84 (10)	90 (10)	85 (10)	68 (10)	68 (10)	62 (10)	76 (10)
% Lithophils (n)	82 (10)	89 (10)	92 (10)	80 (10)	58 (10)	62 (10)	49 (10)	56 (10)
% Insectivore (wt)	68 (10)	76 (10)	81 (10)	78 (10)	54 (10)	60 (10)	54 (10)	86 (10)
% Round suckers (wt)	68 (10)	72 (10)	80 (10)	72 (10)	36 (10)	41 (10)	36 (10)	50 (10)
% DELT	0 (10)	0 (10)	0 (10)	0 (10)	0 (10)	0 (10)	0 (10)	0 (10)
Total	80	90	85	90	95	100	100	95
		Metric scores: 0 = Poor; 5 = Fair; 10 = Good						
		Overall Score: 0-20 = Very Poor; 21-39 = Poor; 40-59 = Fair; 60-79 = Good; >80 = Excellent						

# Wood is Good!



- Rip-rap benefits the aquatic community
- Shoreline stabilization opportunities



# Mussels- Good Ecological Indicators

- Buckhorn (2012)
- Creeper (1976)
- Deertoe (2021)
- Elktoe (1976)
- Fatmucket (1989)
- Fragile Papershell (2012)
- Giant Floater (2021)



# Mussels- Good Ecological Indicators


- Lilliput (2021)
- Mucket (2012)
- Pimpleback (2021)
- Plain Pocketbook (2012)
- Threeridge (1976)
- Wabash Pigtoe (2021)



# Conclusions

- Mainstem Sugar River- excellent quality represented by the fishery
- Dams likely impact fish US movement
- WDNR 2023 repeat surveys except Nelson Rd
- **SOIL HEALTH = RIVER HEALTH**



A man wearing a white baseball cap, a dark t-shirt, a grey life vest, and camouflage pants is sitting in the driver's seat of a small aluminum boat. He is smiling and giving a thumbs-up gesture. The boat has a black outboard motor and a silver control panel. In the background, another boat with people is visible on the river, surrounded by lush green trees.

Mike says, "Its all good!"

# CONNECT WITH US

**Camille Bruhn**

Water Quality Biologist

Camille.bruhn@wisconsin.gov

608-206-2150



/WIDNR



@WIDNR



@WI\_DNR



/WIDNRTV



"WILD WISCONSIN:  
OFF THE RECORD"