

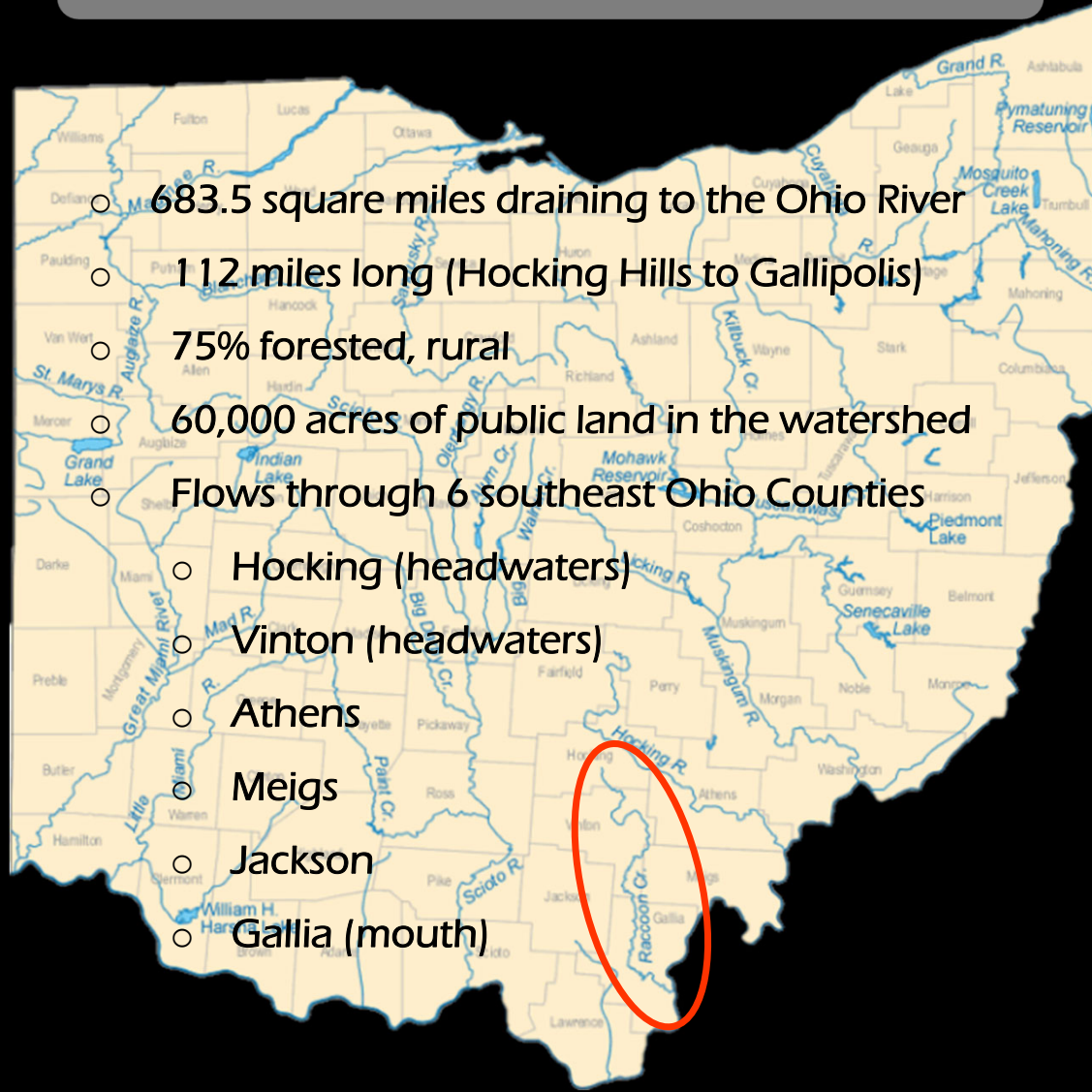
Beyond Reclamation and Remediation, Next Steps in a Recovered Watershed



Amy Mackey, Natalie Kruse Daniels, Nora Sullivan, and Maxwell Omane Henneh

Voinovich School of Leadership and Public Service, Ohio University

Little Raccoon Creek Watershed

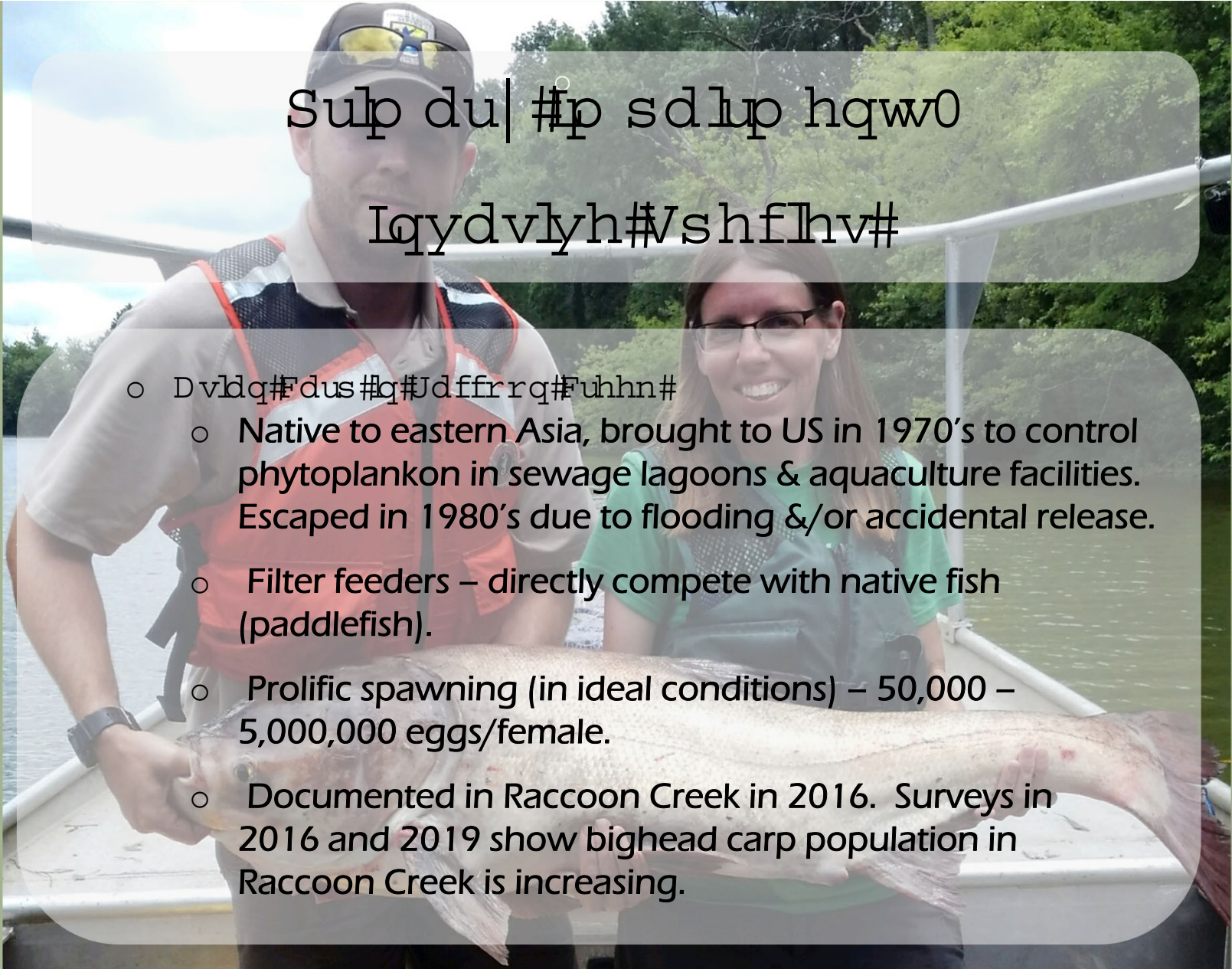


- 683.5 square miles draining to the Ohio River
- 112 miles long (Hocking Hills to Gallipolis)
- 75% forested, rural
- 60,000 acres of public land in the watershed
- Flows through 6 southeast Ohio Counties
 - Hocking (headwaters)
 - Vinton (headwaters)
 - Athens
 - Meigs
 - Jackson
 - Gallia (mouth)

Sup du | #1 s d l u p h q w

- Historic (pre-SMCRA 1976) coal mining
 - The #1 issue in Raccoon Creek and many other streams in the coal-bearing region of Ohio!
 - 50,000 acres mined, 190 stream miles in Raccoon Creek impacted
 - Sedimentation, erosion & habitat degradation
 - Lack of species diversity / increase of invasive species

- Low-head dams- 6 low-head dams in the watershed, only 4 still in place
 - Northup – disintegrating, minimal or no impact
 - Cora Mill – natural rock shelf
 - Vinton – priority for removal, EWH boundary
 - Wellston – municipal water supply (can not remove)
 - Inhibits fish passage
 - Human safety risk, “Drowning machine”
 - Disrupts stream channel morphology

A photograph of a man and a woman on a boat. The man, on the left, is wearing a grey polo shirt, a red life vest, a black baseball cap with sunglasses on top, and a black watch. The woman, on the right, is wearing a green shirt and glasses. They are both smiling and holding a large, silver fish horizontally across the boat. The background shows a body of water and a dense line of green trees under a blue sky with some clouds.

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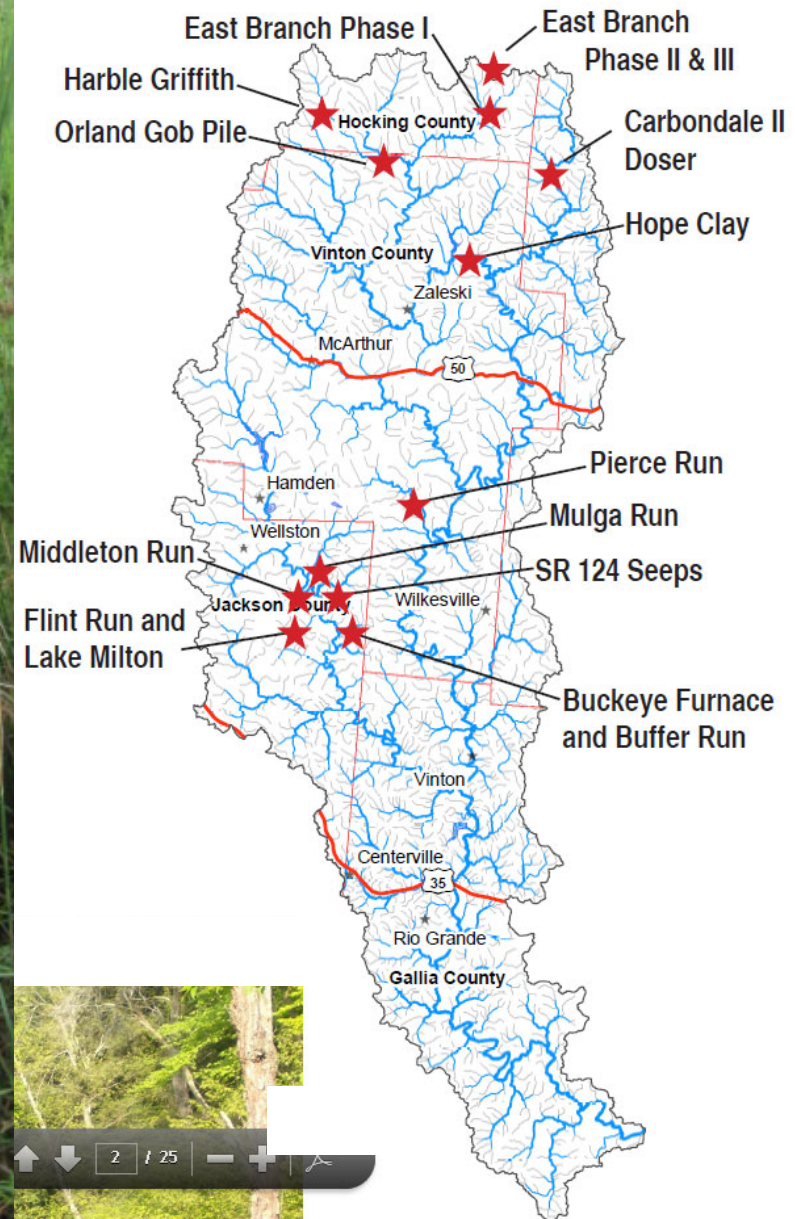
- Dvldq#F dus #q#Jd ffr rq#Fuhhn#
- Native to eastern Asia, brought to US in 1970's to control phytoplankton in sewage lagoons & aquaculture facilities. Escaped in 1980's due to flooding &/or accidental release.
- Filter feeders – directly compete with native fish (paddlefish).
- Prolific spawning (in ideal conditions) – 50,000 – 5,000,000 eggs/female.
- Documented in Raccoon Creek in 2016. Surveys in 2016 and 2019 show bighead carp population in Raccoon Creek is increasing.

Solutions



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- Since 1998....
- Over \$15 million (AML fund, EPA 319 grants, OSM Watershed Cooperative Agreement Program)
- 22 reclamation, treatment, and maintenance projects
- Reclamation and treatment projects can only be completed on ABANDONED mine lands: sites that were mined pre-law!
- Raccoon Creek mainstem and Little Raccoon Creek have always been the goal for recovery



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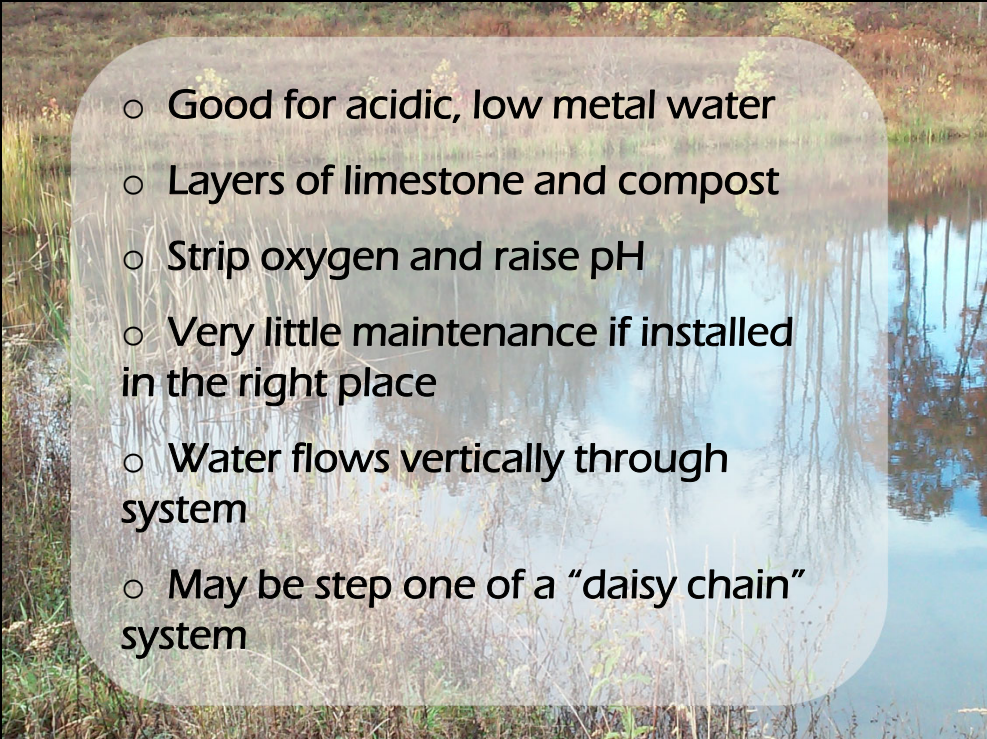
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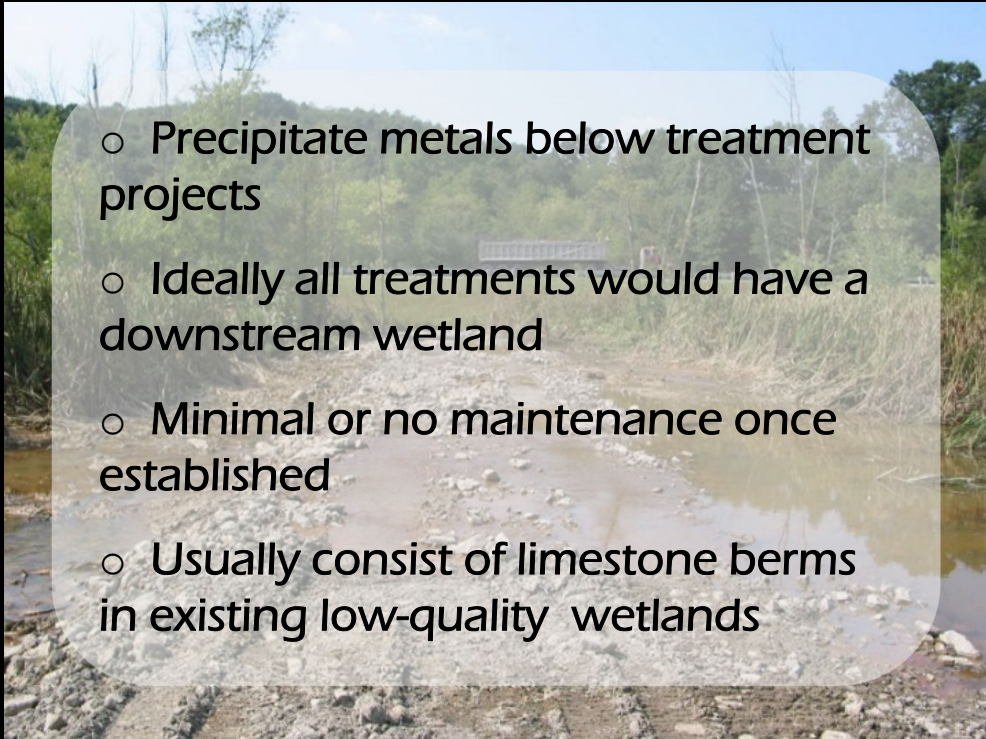
**Passive
Treatment –
Steel Slag Leach
Beds**



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- Good for acidic, low metal water
 - Layers of limestone and compost
 - Strip oxygen and raise pH
 - Very little maintenance if installed in the right place
 - Water flows vertically through system
 - May be step one of a “daisy chain” system

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- Precipitate metals below treatment projects
 - Ideally all treatments would have a downstream wetland
 - Minimal or no maintenance once established
 - Usually consist of limestone berms in existing low-quality wetlands

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- Sandy Run low-head dam removed summer 2019.
- Zaleski State Forest Property, just upstream of Lake Hope
- Small dam, only 40 ft long and ~3' high, but served as a barrier to fish passage
- 12 species of fish downstream, only 4 species upstream
- Created un-natural pool devoid of habitat features
- OEPA 319 Grant funded removal.



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- USFWS, ODNR DOW, OU Voinovich School, WVU, WVDNR, KYF&W cooperative effort
- Ultrasonic, uniquely coded tags surgically implanted to detect movement, dam passage and survival, to understand tributary use, to determine yearly survival, to help direct removal efforts (downstream of RC Byrd Pool)
- Gill nets set across Raccoon Creek to capture and remove adult fish. Successful in 2016 and 2019. Study results show increasing density.
- Much more work needs to be done!!!



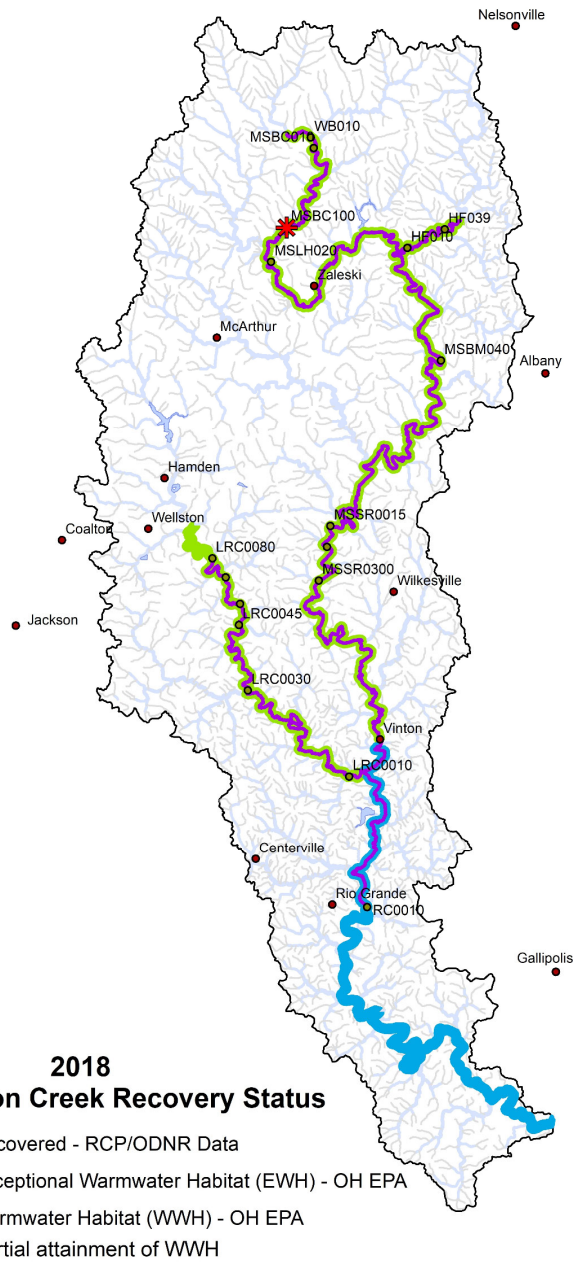
Recovery & Successes



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- Over 20 years
- Over \$15 million dollars
- 21 reclamation, treatment, and maintenance projects (with more on the way)
- Monitoring, monitoring, and more monitoring
- Countless partners, staff, volunteers, students...

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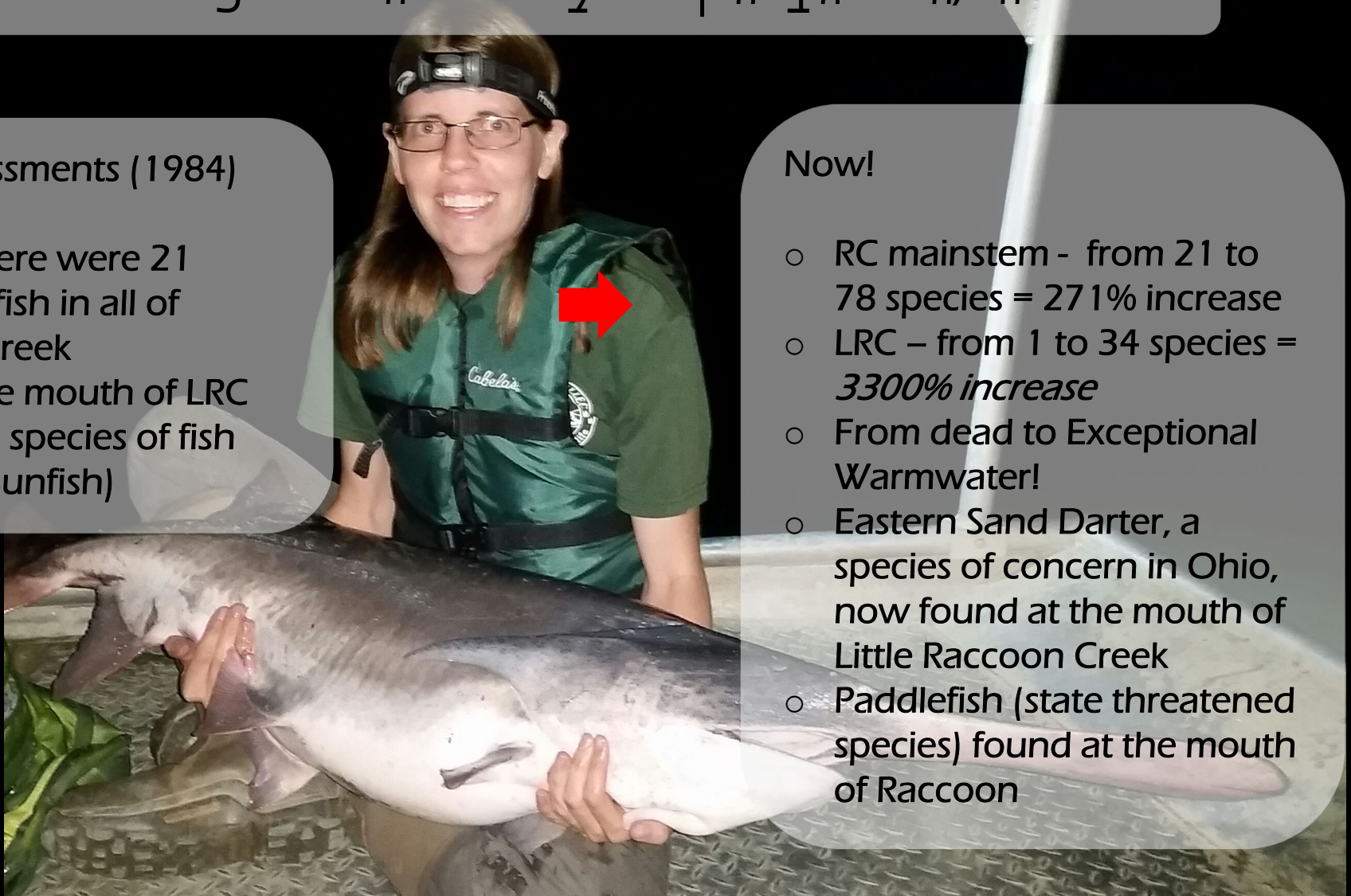
- On August 18th, 2022, Ohio EPA officially approved upgraded Aquatic Life Uses for much of Raccoon Creek
- The headwaters of RC (RM 95.52 to RM 111.0), previously designated Limited Resource Water (the lowest degree of biological integrity) is now meeting Warmwater Habitat
- RC from the low-head dam in Vinton (RM 40.3) to the backwaters of the Ohio River (RM 8.15) is now meeting *Exceptional Warmwater Habitat (EWH)*!
- The entire mainstem of Raccoon Creek, from the Ohio River in Gallia County to the confluence of East and West Branch in Vinton County, is now designated Warmwater Habitat or Exceptional Warmwater Habitat



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Baseline assessments (1984)

- In 1981 there were 21 species of fish in all of Raccoon Creek
- In 1984 the mouth of LRC had only 1 species of fish (Longear Sunfish)



Now!

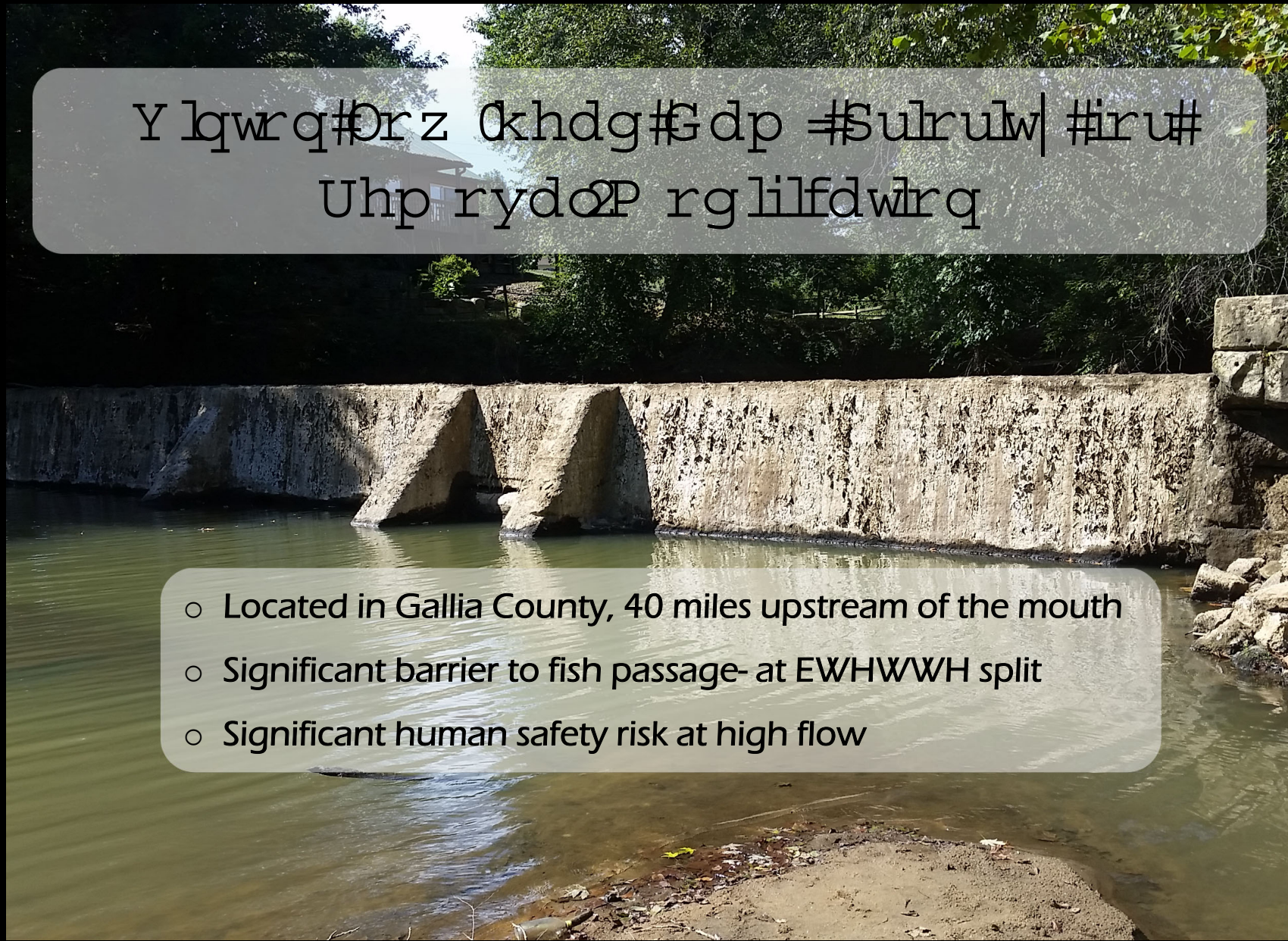
- RC mainstem - from 21 to 78 species = 271% increase
- LRC – from 1 to 34 species = *3300% increase*
- From dead to Exceptional Warmwater!
- Eastern Sand Darter, a species of concern in Ohio, now found at the mouth of Little Raccoon Creek
- Paddlefish (state threatened species) found at the mouth of Raccoon



The Future

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- Located in Gallia County, 40 miles upstream of the mouth
- Significant barrier to fish passage- at EWHWWH split
- Significant human safety risk at high flow



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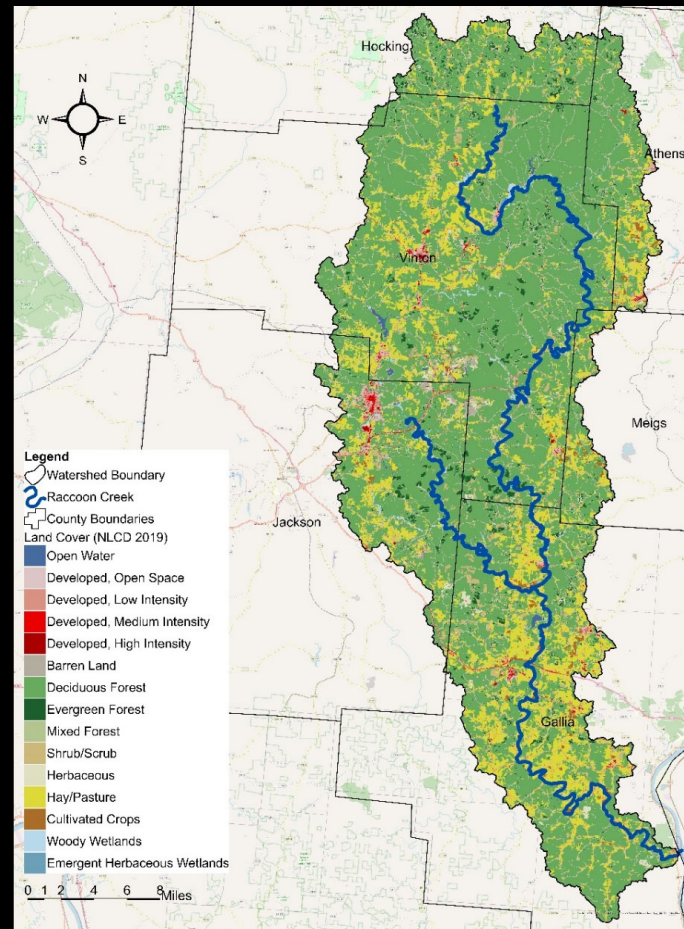
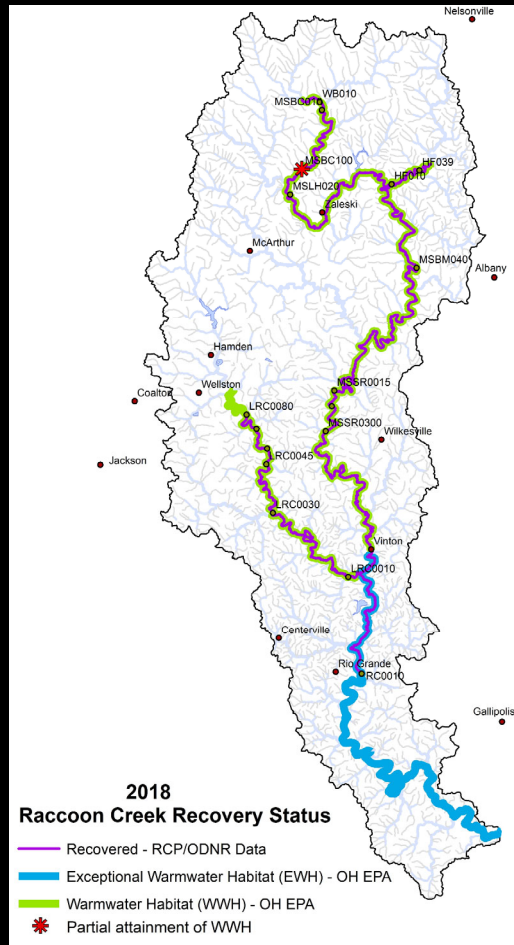




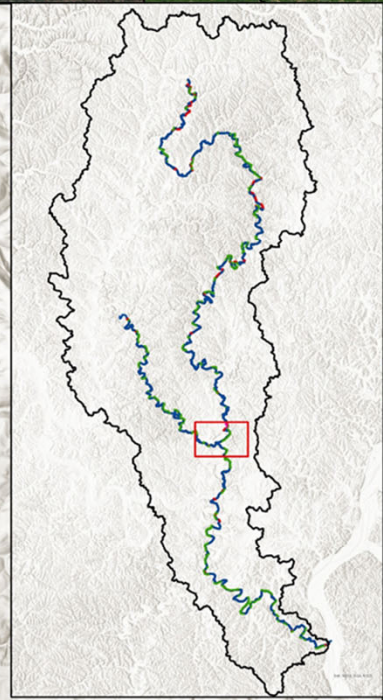
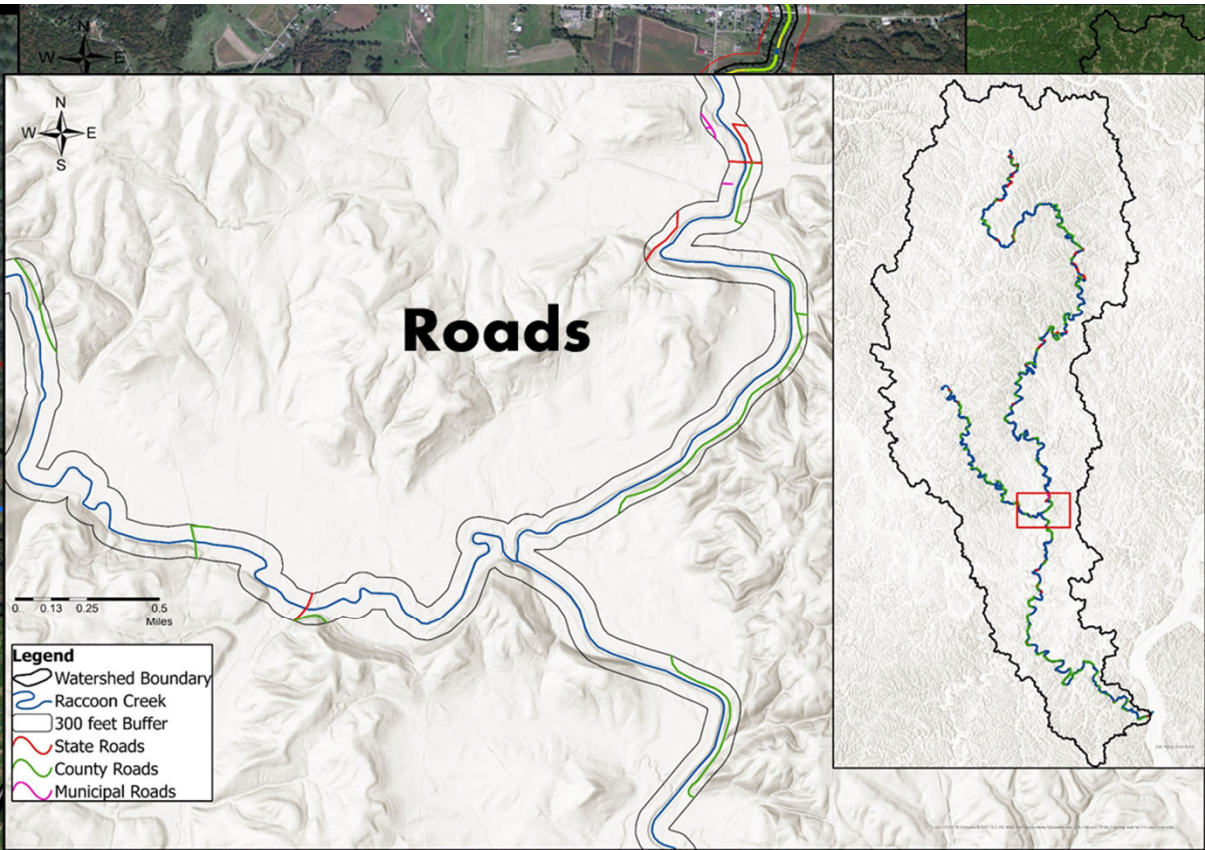
Wild, Scenic, or Recreational

- Wild, Scenic, or Recreational
- Criteria include:
 - Free flowing
 - Roads in 300 ft buffer of stream
 - Road crossings
 - Length of reach
 - Commercial, industrial, and residential development
 - Native forest or wetland riparian corridor

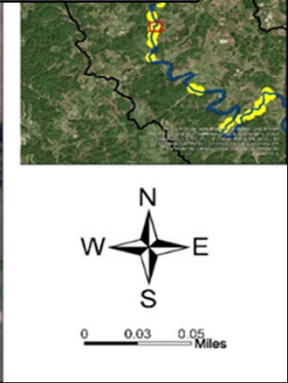
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Established 120 and 300 ft. buffers



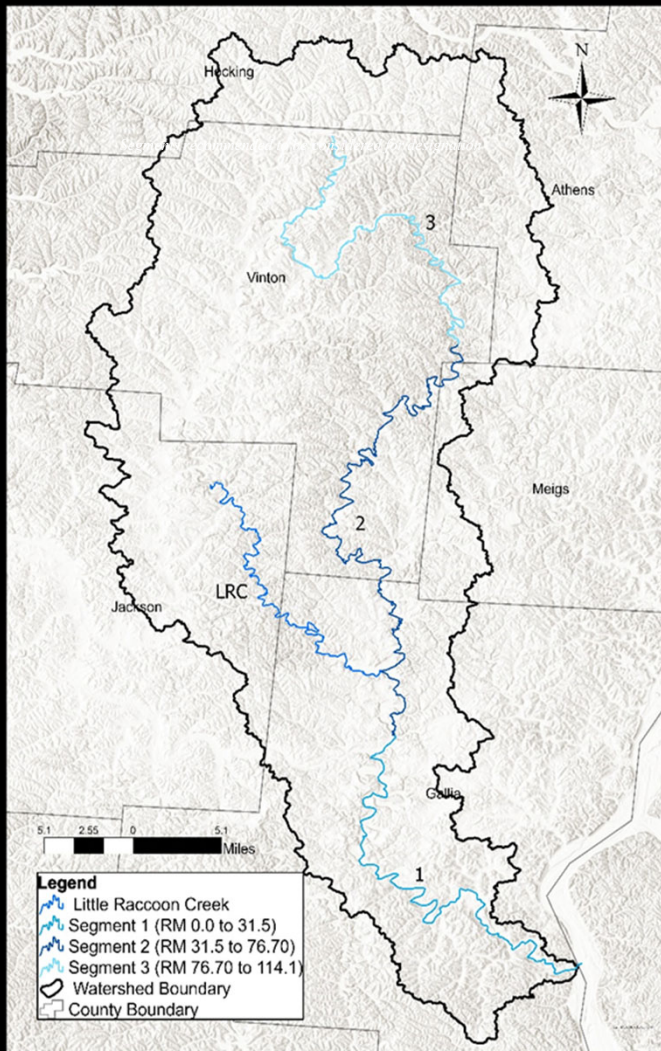
Land Cover Class v
120 ft Raccoon Cre



Bridge Crossings

- > The different Wild, Scenic, and Recreational River criteria regarding bridge crossings state that there should be no limited access highway crossings within the proposed river segment
- > 47 bridge crossings were traced within the 300 foot buffer of Little Raccoon Creek and Raccoon Creek
- > Limited access highways SR 32 near Mulga run and US highway 35 (Appalachian Hwy) which passes through Rio Grande at RM 65.2
- > Majority of crossings can be found within the Vinton, Gallia and Meigs Counties

River Mile	Road	County
0.4	State Route 7	Gallia
10.3	CR. 20	
9.78	CR.18	
14.3	TR. 394 / Blessing Road	
22.15	SR 141	
23.62	CR. 12 / Cora Mill Road	
27.06	TR. 420 / Garners Ford Bridge	
29.2	SR 588	
29.3	CR. 71	
30.7	U.S. 35	
40.01	SR 160: SR. 325	
	MR132C	
	MR 130E	
44.6	SR. 160	
50.1	T-4 / Covered Bridge	
53.5	T-8 / Minerton Chapel Road	Vinton
54.9	SR. 124	
58.21	T-25 / Clarion Road	
58.6	CR. 9 / Hawk Station Road	
62.8	SR 160 / Main Street	
63.8	CR. 28 / Cotterill Road	
65.15	Copper Road	
66.2	SR 32: SR 32	
67.8	CR. 38A / Eakin Mile Covered Bridge	
68.04	CR. 38B Arbaugh Road	
68.7	SR. 32	
71.25	SR. 32 / Appalachian Hwy	
72.22	CR. 43C / Vales Mills	
75.9	T-1 / Rutherford Road	Vinton/Meigs
78.9	T-4 / Staneart Hollow Road	
80.1	T-4 / Staneart Hollow Road	
80.61	U.S 50	
83.05	SR 356	
84.01	SR 356	
89.4	T-1 / Buck Lane	
89.9	T-18	
92.3	CR. 3	
96.9	SR. 278	
97.2	T- F3	
98.35	T-F3	
99.6	SR. 677 / Power Plant Road	
102	T-18 /Creek Road	
104.63	SR. 328	
108.1	T-13 / Mine White Road	
109	SR 328	
111.4	SR 328	

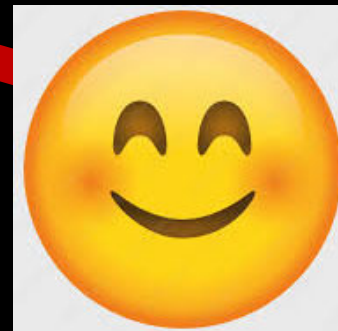


Data Source: ODOT, USGS, NLCD and NHD

Little Raccoon Creek Watershed

- The entire reach meets some specific criteria, if not all, for Wild, Scenic, and Recreational River designation.
- The entire Little Raccoon Creek, which is 25.7 miles, can be considered for Recreational River Designation.
- The Mainstem to be considered for designation
 - Mouth at RM 0.0 to 31.5 between Adamsville and Harrisburg
 - Harrisburg at RM 31.5 to 76.7 near Bolins Mills
 - Bolins Mills at RM 76.70 to 114.1 at the headwaters near SR 328

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- Ohio Department of Natural Resources
 - Division of Mineral Resources Management
 - Division of Wildlife
 - Division of Forestry
- Ohio Environmental Protection Agency
- Office of Surface Mining
- Wayne National Forest
- County Soil and Water Conservation Districts
- Schools and Universities
- Department of Agriculture
- Local Landowners
- Mining Companies
- Local non-profits and conservation clubs
- The list goes on and on!!





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David Sullivan

sullivan@ohio.edu

Environmental Specialist

Aniy Mackey

mackey@ohio.edu

Raccoon Creek Watershed Coordinator,
Energy and the Environment Project
Manager

Adriane Kruse-Danley

krusen@ohio.edu

Professor, Environmental Studies

Ohio University Voinovich School of
Leadership and Public Service