



# Rural Action

Working Together to Revitalize Appalachian Ohio

## Measuring Success: Biological Recovery in Impaired Streams

Michelle Shively  
Watershed Coordinator, Rural Action  
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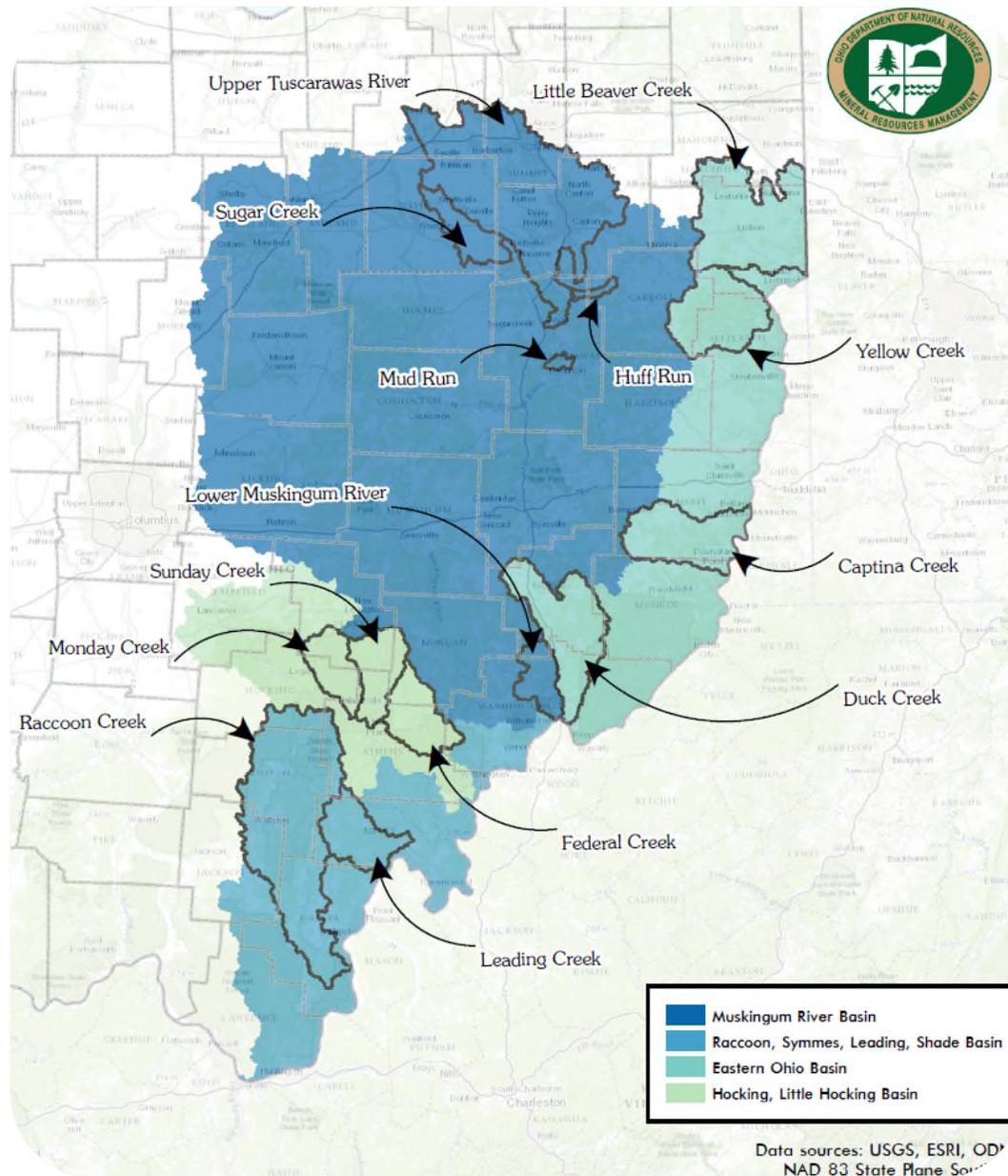


# RURAL ACTION WATERSHED RESTORATION

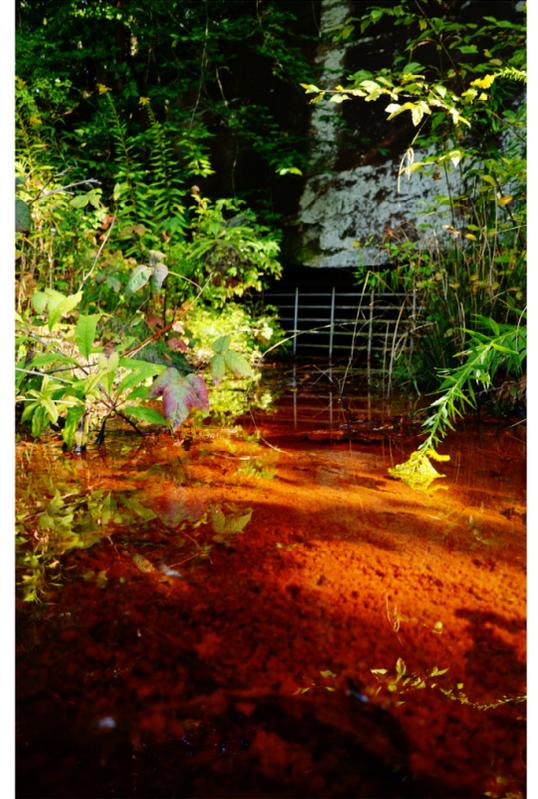
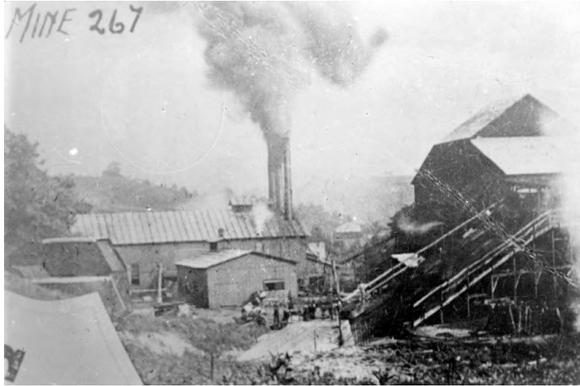
*Improved Water Quality, Healthy Communities*



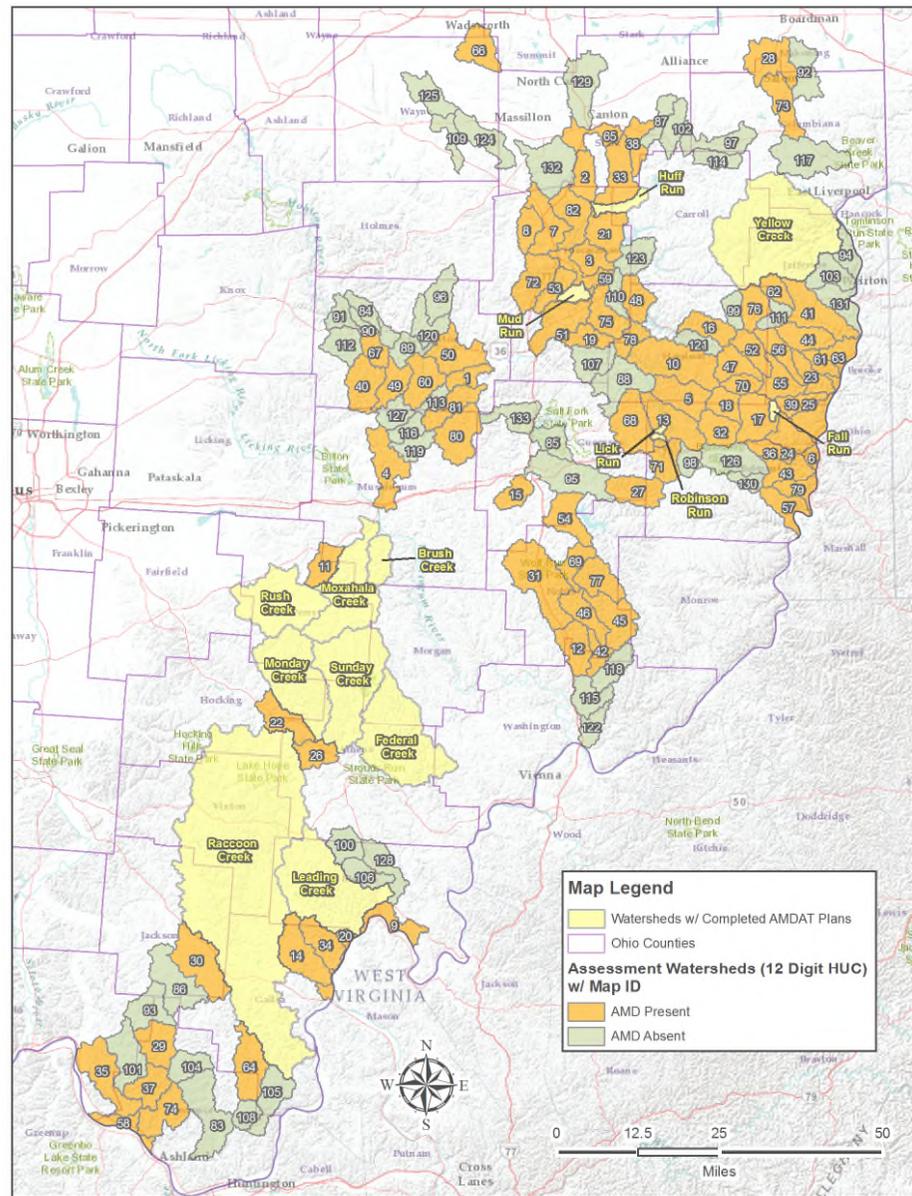
Learn More at [www.ruralaction.org](http://www.ruralaction.org)



# THE IMPAIRMENT



# A DISMAL BASELINE



# RECLAMATION EFFORTS

- Collaboration was key
- Installed 50 treatment systems, over 110 subsidence hole closures and 55 acres of gob piles reclaimed
- Over \$23 million leveraged





# RECLAMATION EFFORTS



Existing Conditions



Post Reclamation



# RECLAMATION EFFORTS



Existing Conditions



Treatment

# RECLAMATION EFFORTS



Existing Conditions



Treatment



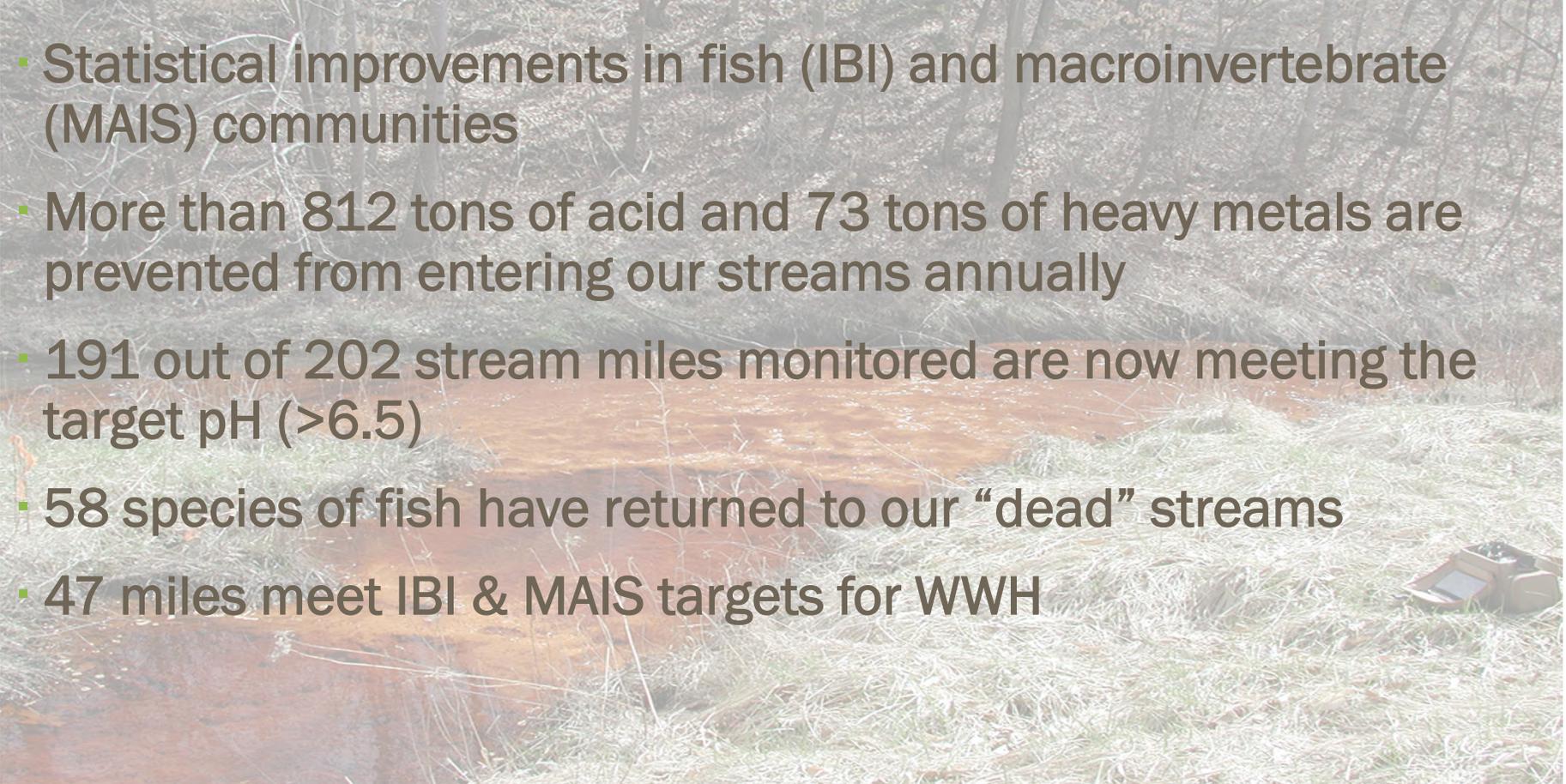
# MEASURING RECOVERY

- 500+ chemical samples collected annually and 50+ biological (fish & bug) sites monitored annually
- Partnership between Rural Action, ODNR & OEPA
- Data housed at [www.watersheddata.com](http://www.watersheddata.com), managed by Ohio University

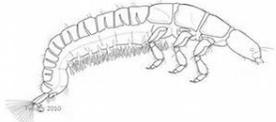
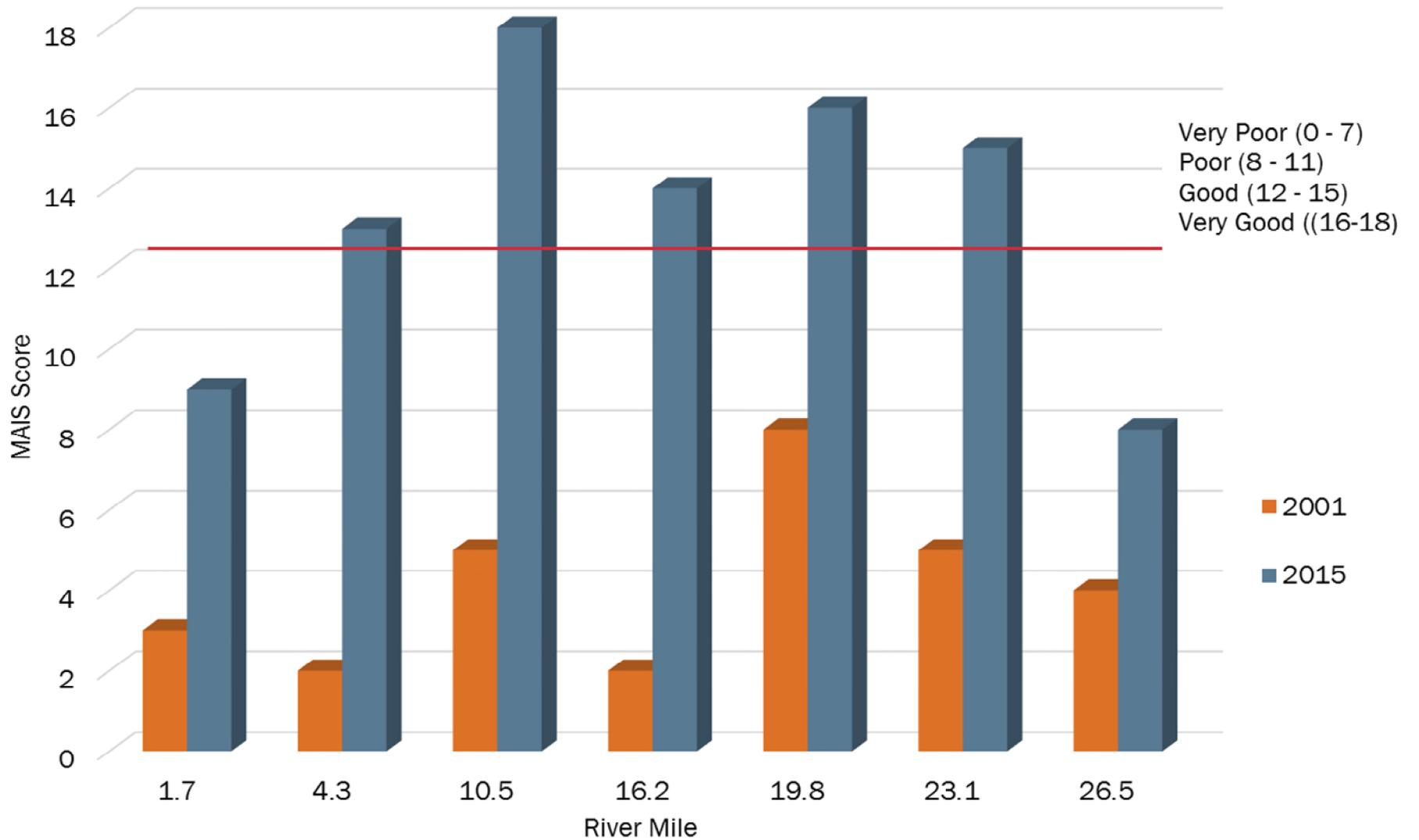




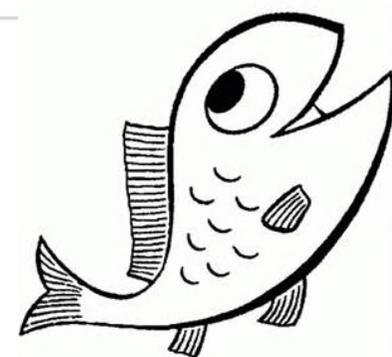
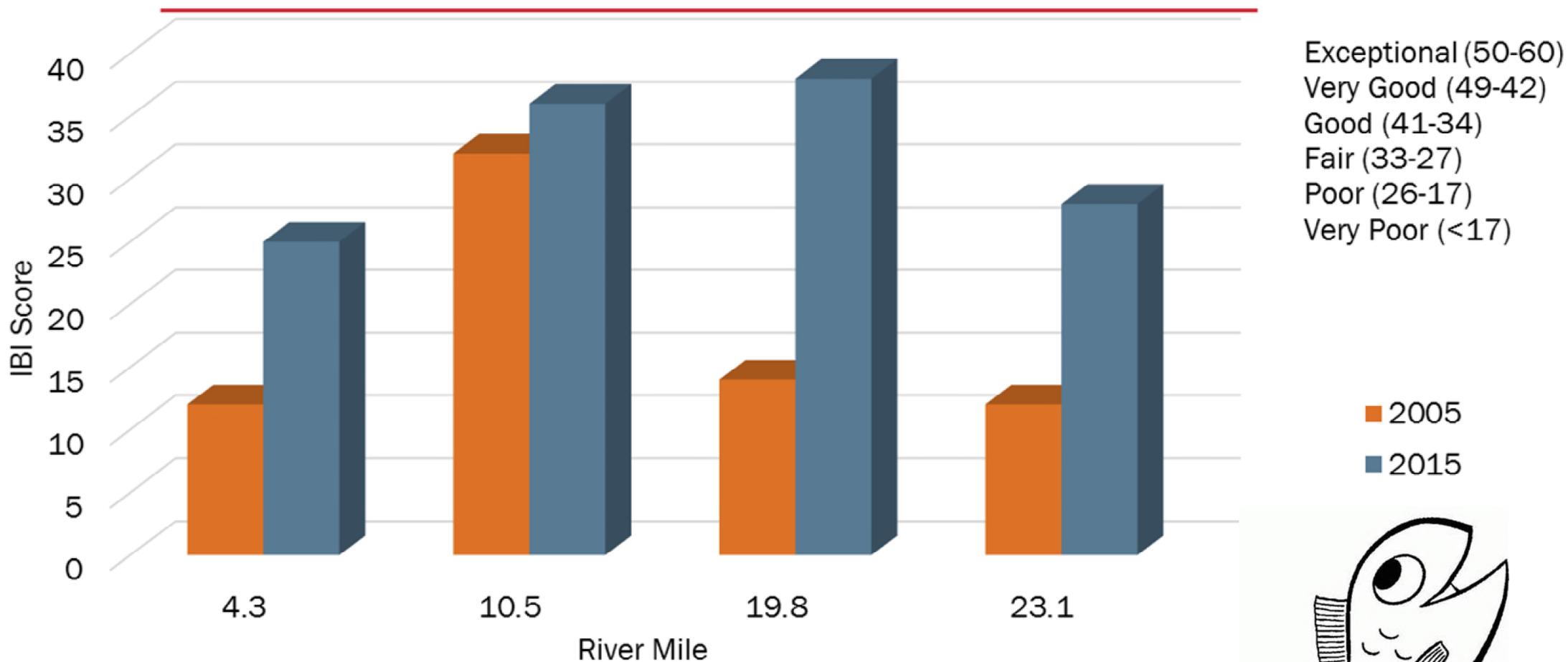
# RESULTS

- Statistical improvements in fish (IBI) and macroinvertebrate (MAIS) communities
  - More than 812 tons of acid and 73 tons of heavy metals are prevented from entering our streams annually
  - 191 out of 202 stream miles monitored are now meeting the target pH (>6.5)
  - 58 species of fish have returned to our “dead” streams
  - 47 miles meet IBI & MAIS targets for WWH
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# Monday Creek MAIS Scores 2001 Vs. 2015



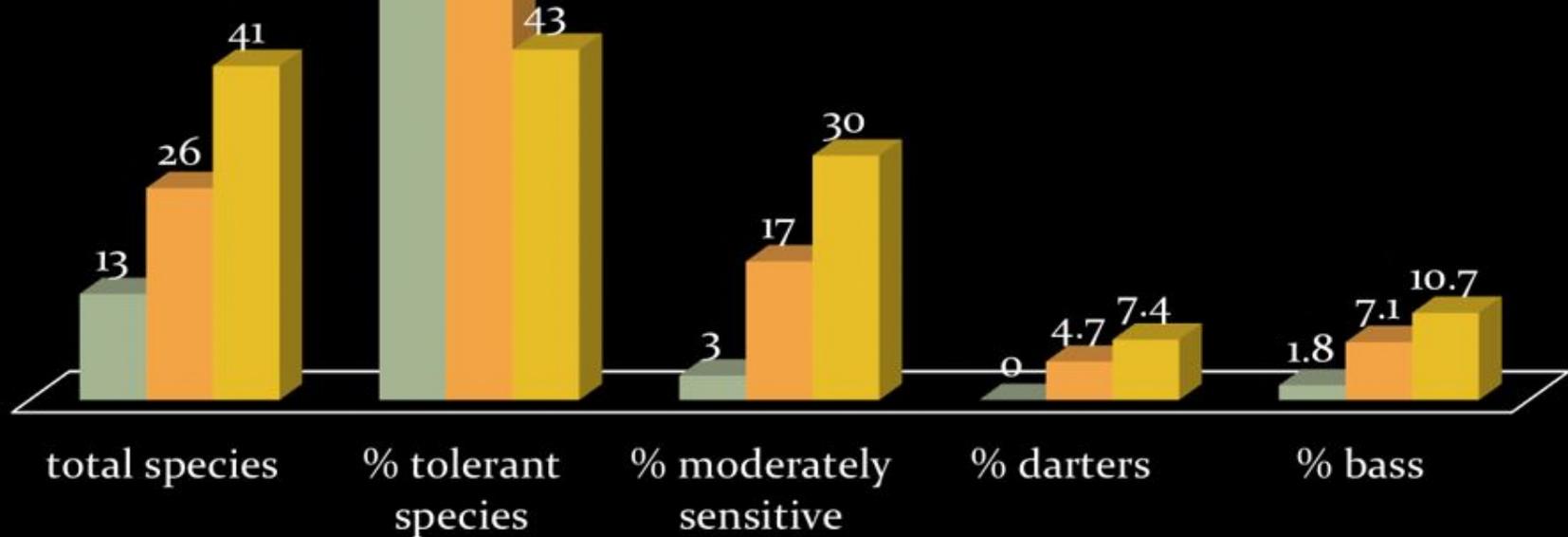
# Monday Creek IBI Scores 2005 Vs. 2015



# Little Raccoon Creek - Fish Community Recovery

■ 1980s ■ 1990s ■ 2000s

Average fish per site increased from 20 in the 1980s (some sites had zero fish) to 96 in the 2000s!



# RESULTS – WEST BRANCH SUNDAY CREEK

Site	Year	IBI Score	Narrative Rating	WWH Target	# of fish	Number of Native Species	Number of Darter Species	Number of Headwater Species	Number of Minnow Species	Number of Sensitive Species	Proportion of Tolerant Species	Proportion of Omnivores	Proportion of Insectivores	Proportion of Pioneering Species	Number of Individuals (per 0.3km)	Number of Simple Lithophilic Species	Proportion w/ DELTs
WB 051	2015	34	Fair	40	359	13	3	0	4	2	53.20	11.14	29.81	59.05	336	5	0.0
WB 051	2014	30	Fair	40	265	12	3	1	5	2	65.3	8.7	19.2	60.8	184	6	0.0
WB 051	2005	12	Very Poor	40	0	**Individual metric data not available											

	Post AMD Treatment
	Pre AMD Treatment

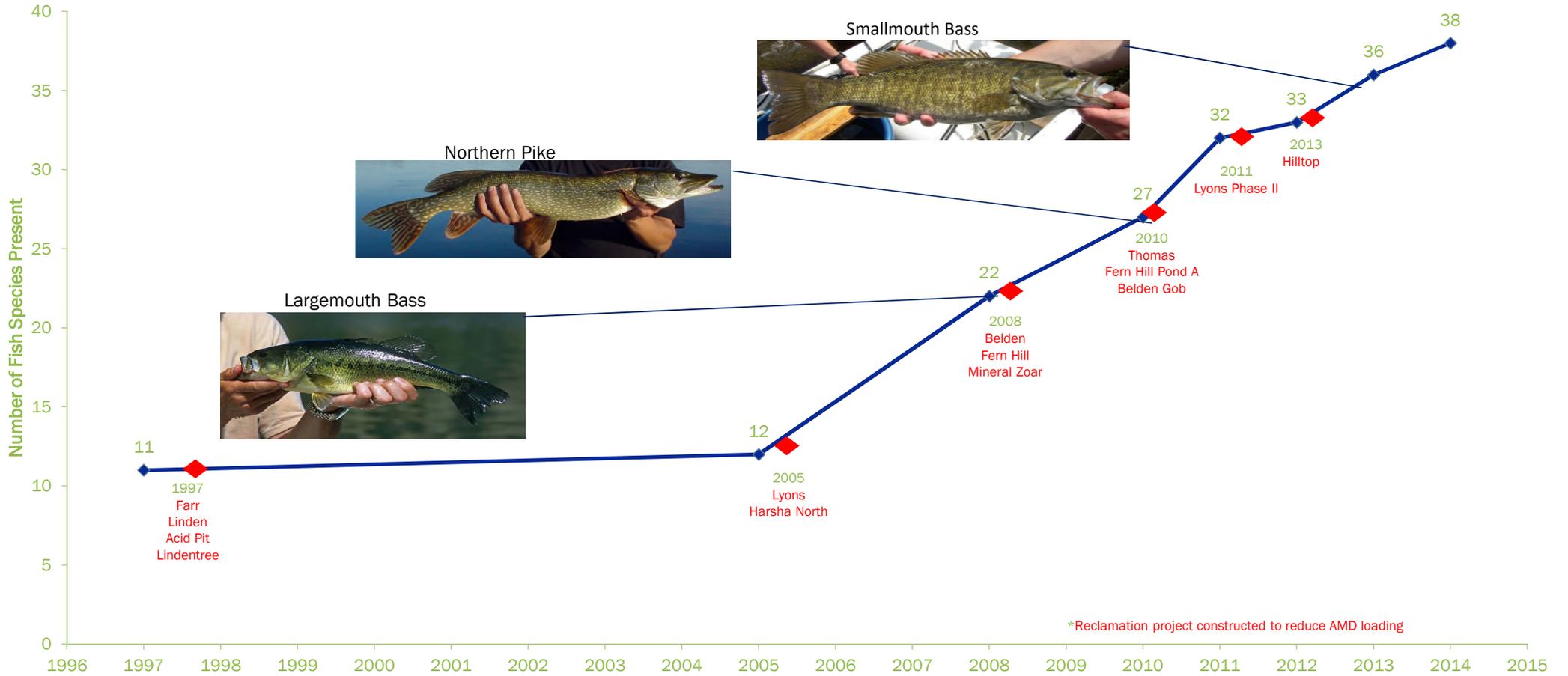
## WB 51 Fish Data Notes:

- From 0 fish (2005) to 359 fish (2015)
- IBI score of 12 (lowest possible score) in 2005 to an IBI score of 34 in 2015
- From 2014 to 2015: increase in # of fish and # of native species, and a decrease in % tolerant species



Orangethroat Darter WB 51 10/2/15

# Recovery of Fish Species in Huff Run Mineral City, OH





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- 47 miles meet IBI & MAIS targets for WWH
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[michelle@sundaycreek.org](mailto:michelle@sundaycreek.org)

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THANK YOU! QUESTIONS?