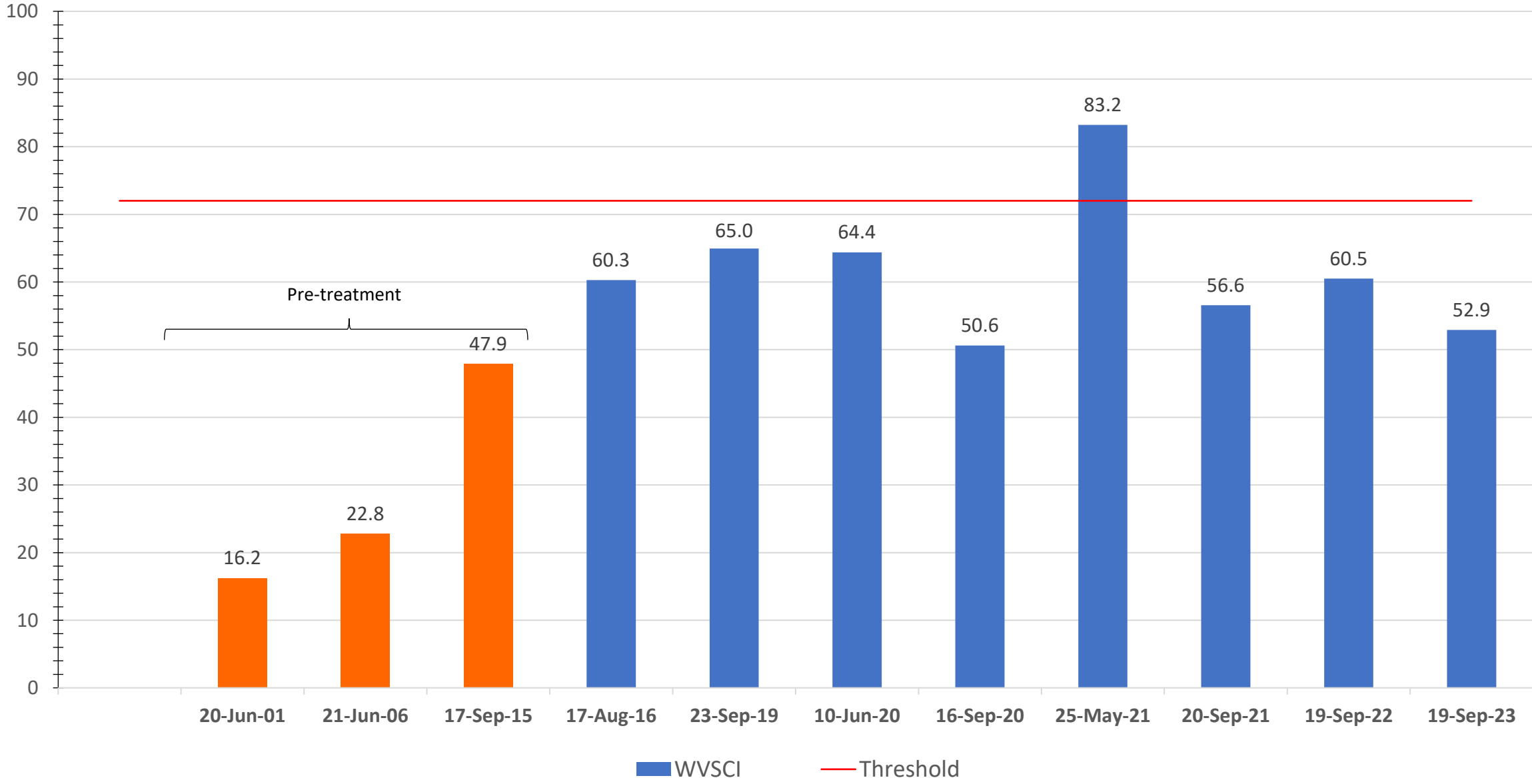
WVDEP – Water Quality Standards and Assessment – Monitoring Unit
Muddy Creek (WVMC-17) Biological Restoration Updates - April 3, 2024

- The WV Stream Condition Index (WVSCI) is an Index of Biotic Integrity (IBI) that summarizes the health of the aquatic life community using samples of benthic macroinvertebrates from riffle/run habitats in streams.
- WVSCI scoring ranges from 0 – 100 with an attainment threshold established at 72.0 based on the 5th percentile of reference samples.
- WVSCI scores have demonstrated significant improvement in biological health when comparing pre- and post-treatment data at stations downstream of the treatment facility (mile point 0.0 and 2.1) on Muddy Creek (WVMC-17).
- At MP 0.0 in May of 2021, the WVSCI score (83.2) exceeded the attainment threshold of 72.0, however three subsequent samples in September 2021, 2022, and 2023 have produced scores below the attainment threshold.
- At MP 2.1 in May of 2021, the WVSCI score (71.2) nearly attained the threshold of 72.0, however three subsequent samples in 2021, 2022, and 2023 have produced scores below the attainment threshold.
- All WVSCI scores from the upstream control station at mile point 4.4 have exceeded the attainment threshold of 72.0, including most recently in the fall of 2023 when two samples were collected.
- New benthic samples from these three stations on Muddy Creek will be collected in September of 2024 by WVDEP Water Quality Standards and Assessment's Monitoring Unit.

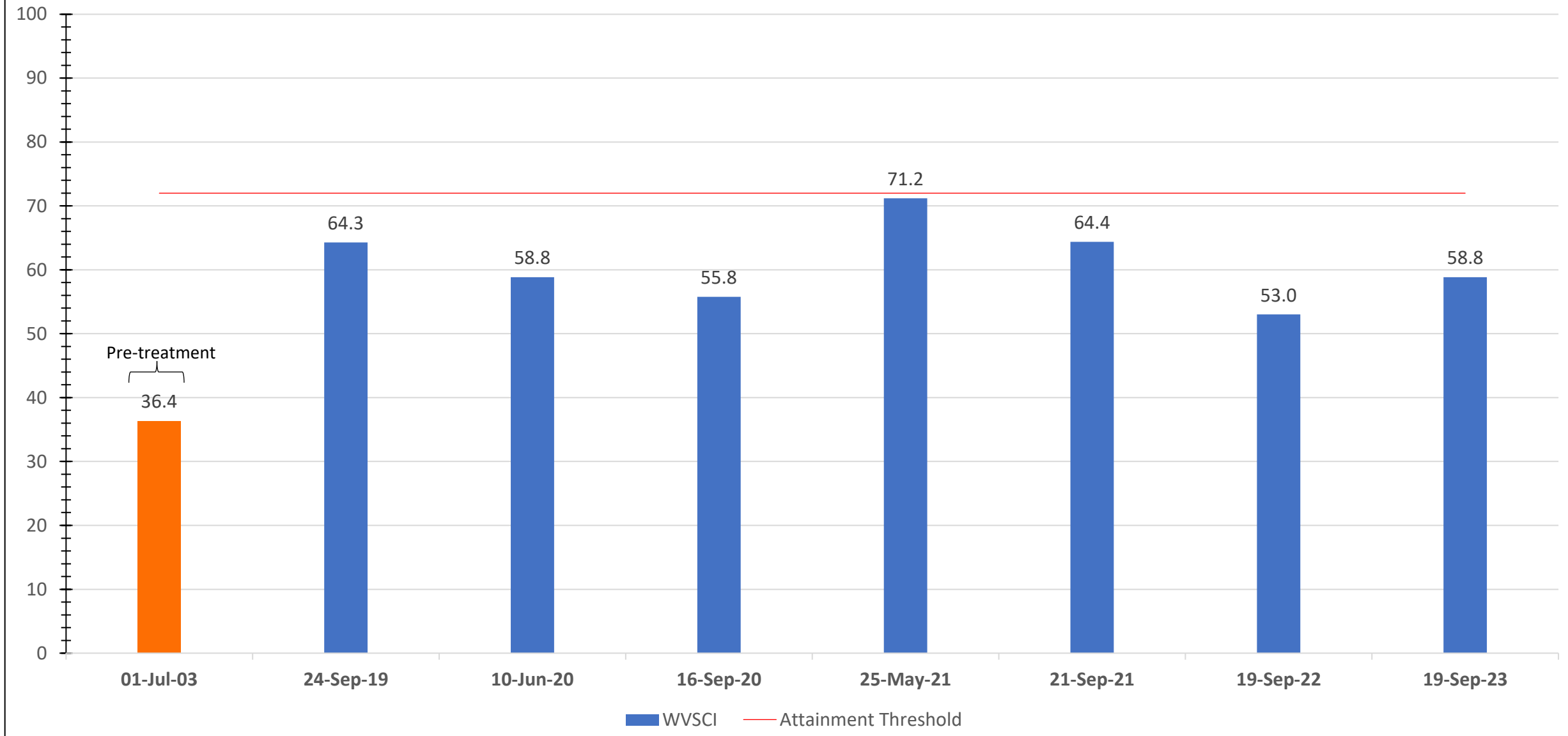
WVSCI - Muddy Creek MP 0.0 – Near Mouth
Approx 2.8 Miles Downstream of Treatment Facility

WVDEP WQSAS Data



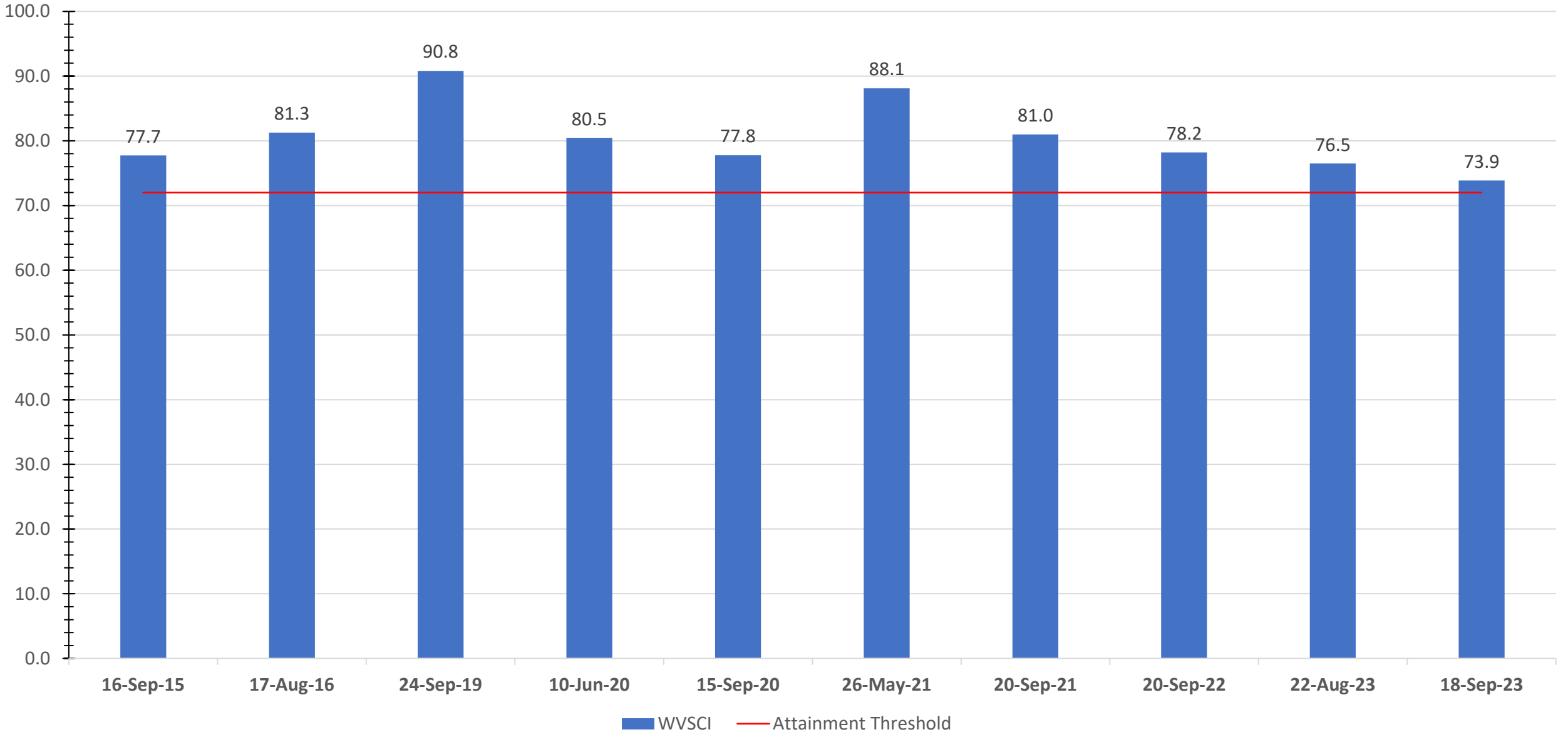
WVSCI - Muddy Creek MP 2.1 – Near Crab Orchard Run
Approx. 0.7 Downstream of Treatment Facility

WVDEP WQSAS Data



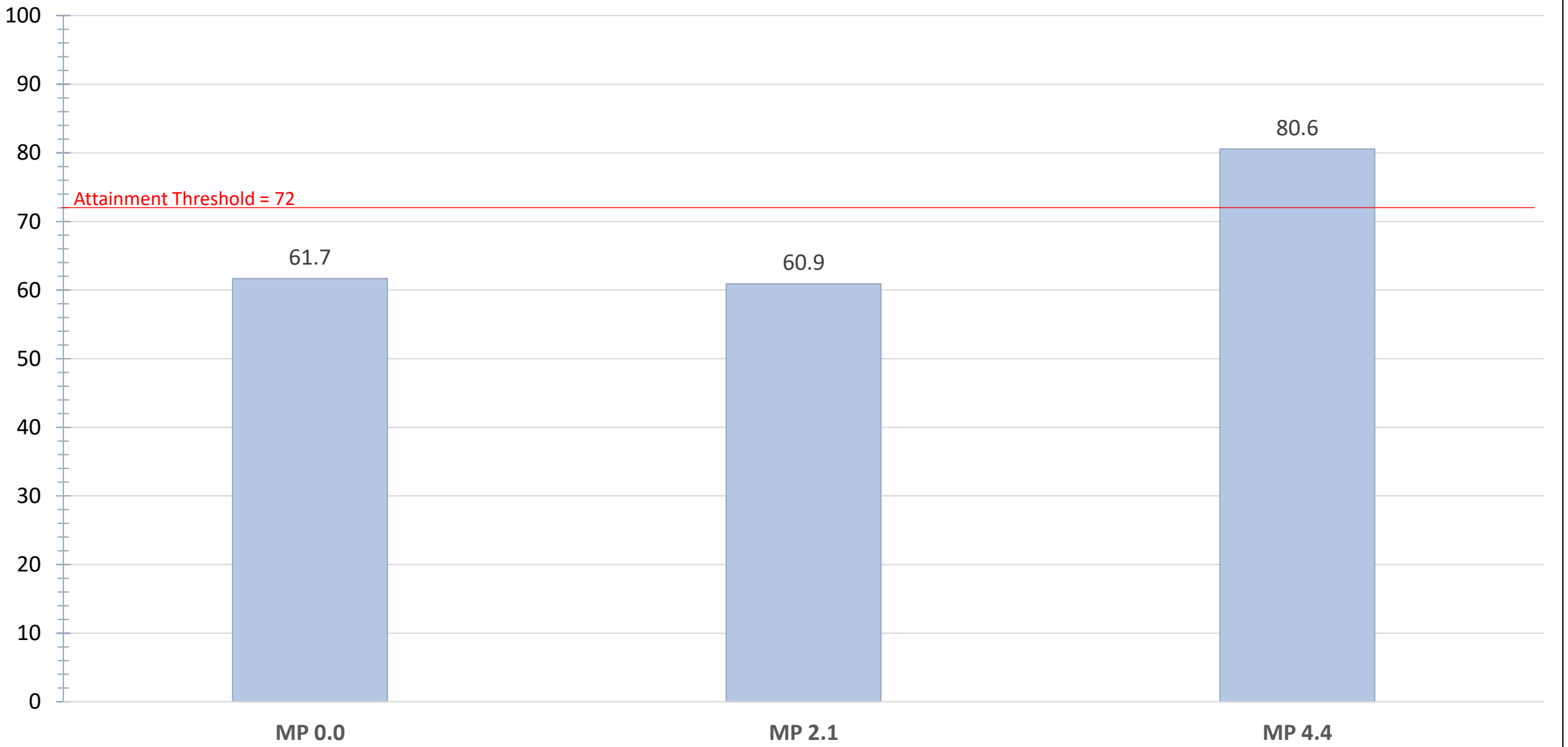
WVSCI - Muddy Creek MP 4.4 @ CR-17 Bridge
Upstream of Treatment Facility

WVDEP WQSAS Data



Average Post-Treatment WVSCI Scores for Muddy Creek MP 0.0 and MP 2.1 (downstream of treatment facility) Compared to Average of all Scores for MP 4.4

WVDEP WQSAS Data



Muddy Creek Fish Community Comparison

Pre-treatment (2015) vs Post-treatment (2019, 2021, 2023)

WVDEP – WQSAS Data

Mile Point	MP 0.0 (d.s. treatment)				MP 2.1 (d.s. treatment)			MP 4.4 (u.s. treatment)		
Sample Year	2015	2019	2021	2023	2019	2021	2023	2015	2019	2023
Bluegill			1			2				
Brown Trout								6	1	3
Creek Chub					10	4	15	301	191	133
Green Sunfish		3	12	4	12	11	7			
Greenside Darter				1						
Longnose Dace				3				26	27	3
Mottled Sculpin	No	1	1		3		1	225	653	340
Rainbow Trout	Fish				1	1	1		2	12
River Chub	Observed	111	77	83						
Rock Bass	in 300 Meter	2		4						
Rosyface Shiner	Sample	10	38	19						
Rosyside Dace	Reach	1	1							
Smallmouth Bass		12	9	12						
Spotfin Shiner		1								
Stonecat		2		8						
Tiger Trout			6							
Western Blacknose Dace			4			2		461	485	310
White Sucker								22	82	37
Yellow Bullhead			1							
Total Species	**0**	**9**	**10**	**8**	**4**	**5**	**4**	**6**	**7**	**7**
Total Collected	**0**	**143**	**150**	**134**	**26**	**20**	**24**	**1041**	**1441**	**838**
Fish/meter	**0.00**	**0.48**	**0.50**	**0.45**	**0.09**	**0.07**	**0.08**	**3.47**	**4.80**	**2.79**

- Significant fish community improvements have been demonstrated downstream of the treatment facility at MP 0.0 when comparing pre- and post-treatment samples – in fact, no fish were observed in 2015 after electrofishing a 300-meter reach.
- Post-treatment surveys at MP 0.0 have produced fifteen species collectively from 2019, 2021, 2023 surveys.
- There was no pre-treatment fish community sample for MP 2.1, however, 6 species have been observed from 2019, 2021, 2023 surveys.
- Although low in abundance, the collection of Mottled Sculpin from MP 0.0 and 2.1 is notable in terms of biological recovery
- The fish community at MP 0.0 near the mouth of Muddy Creek appears to be showing more recovery than MP 2.1 with higher fish species diversity and overall higher fish abundance.
- The upstream control station at MP 4.4 will continue to serve as a source of fish recruitment for Muddy Creek segments downstream of the treatment facility.
- Cheat River will also provide recruitment opportunities for species adapted to live in smaller, cooler streams like lower Muddy Creek.