Fish Kill Investigation-Field Report

Preservation Method

Live, ambient temperature

Live, ambient temperature

Date of investigation: March 19 2022 and Time: 0900 - 1300 on 3/130 and 1130 - 1530 on 3/120 and 1130 - 1530 on 3/120 and 1130 - 1530 on 3/120 Date of kill: 3/18/2022 Investigators: NWK	Daalamanad											
Nearest town/ landmark: Back River Wastewater Treatment Plant in Dundalk Long: -76.48189° County: Baltimore County	March 22, 2022 1300 on 3/19 and 1130 – 1530 on				19 and	Date of kill: 3/18/2022					gators:	
Weather Private Pond Wetland Reservoir Quean Private Pond Wetland Reservoir Quean Private Pond Quean Primary land use: Agriculture Residential Reservoir Quean Reservoir Quean Reservoir Quean Reservoir Quean Reservoir Quean Reservoir Quean Quea	Water Body:	Back Ri	ver		•		GPS coording	nates:	Lat: 39.29337	7 °		
Stream Private Pond Ocean Agriculture Agriculture Reservoir Cean Agriculture Reservoir Reservoir Cean Cean Agriculture Residential Residenti	Nearest town	/ landma	ark: Back Ri	ver Wastewa	ater Treatmen	nt Plant in	Dundalk	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			,	: Baltimore
Weather Weather during investigation: Millid and pleasant weather, partial sunny, and breazy Meather during investigation: Millid and pleasant weather, partial sunny, and breazy Chter observations/ recent weather: Full moon causes spring tides with higher than normal high tide and lower than normal low tide. High winds from passing weather fronts. Habitat/ Fauna Water appearance (color/ odor): River was greenish in color, normal; no observed dark discoloration or other indication of a pollutant discharge. No observable odor. Substrate type/ appearance: Substrate in shallows had normal appearance. Algae presence: Minor, small bloom of single cell green algae; possibly Chlamydomonas; count was 2424 cells/mL; not a HAB taxa. Other habitat observations: Some yellowish pollen observed on water surface, but not extensive; normal to see pollen on the water this time of year. Presence/ behavior of live fish: Did not observe live fish during investigation; water somewhat turbid. Presence/ types of aquatic invertebrates (order/ family/ relative abundance): Not observed Water Quality Station Time Depth (m) (ppm) Poiss. O2 Temp °C pH (cond. (mS/cm) (ppt) Secchi Poiss (ppt)	☐ Stream ☐ River ☐ Lake		Reservo	oir 🔲	Ocean		Agriculture Industrial Mining		Residential Urban			
Weather Weather during investigation: Milld and pleasant weather, partial sunny, and breezy Air Temp ~65 F Wind direction/ speed: Steady breeze from S/SW Other observations/ recent weather: Full moon causes spring tides with higher than normal high tide and lower than normal low tide. High winds from passing weather fronts. Habitat/ Fauna Water appearance (color/ odor): River was greenish in color, normal; no observed dark discoloration or other indication of a pollutant discharge. No observable odor. Substrate type/ appearance: Substrate in shallows had normal appearance. Algae presence: Minor, small bloom of single cell green algae; possibly Chlamydomonas; count was 2424 cells/mL; not a HAB taxa. Other habitat observations: Some yellowish pollen observed on water surface, but not extensive; normal to see pollen on the water this time of year. Presence/ behavior of live fish: Did not observe live fish during investigation; water somewhat turbid. Presence/ types of aquatic invertebrates (order/ family/ relative abundance): Not observed Water Quality Station Time Depth (m) (ppm) (ppm) (ppm) (mS/cm) (ppt) (mS/cm) (ppt) (p								l effluen	t near where the	e dead fish	were obs	erved. Dense
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			3.01	7.69	14.26	7.35	1222	0.61		DO % S	at: /5.3	URP: 174

Fish Samples	;
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Water Samples

Pier at Cox Pt Park

Pier at Back River WWTP

Station

Station	Time	Sample #	Species	Analysis	Pres. Method
None taken					

Analysis

Examine for algae presence

Examine for algae presence

Bottle #

443

196

Time

0916

1230

Fish Kill Investigation-Field Report

Kill Information							
Upper Limit: Back River WWTP	Lower Limit: Back River WWTP			Stream miles (lake acres) affected: Dead fish occurred along approximately 1000' of shoreline			
Species affected	Size	# counted	Extrapolated 1	Γotal	\$/ea.	Value*	
Gizzard Shad	15"	250	250		unknown	unknown	

TOTALS

Suspected cause of kill: Unknown. I suspect the school of gizzard shad became confined in a shallow water area, which was exacerbated by spring tide lower than normal low tide, and subsequently depleted available oxygen. Reports of dark discharge and floating mats of dark matter were not observed during investigation. Creek appeared normal in color with no apparent odor. Water quality was normal for this time of year. If raw sewage discharge did occur, this would accelerate O2 depletion and would be primary cause. The dead gizzard shad were located along the shoreline by the Back River WWTP pier. No dead fish were observed at Cox Point Park or other nearby locations checked on Back River. Wind was blowing dead fish from shoreline by Back River WWTP out into open water of creek, so there may be more citizen reports as these fish move with the tide.

UPDATED 3-22-2022: Follow-up investigation on this day confirmed that there are floating mats of filamentous algae currently in the Back River. Floating algal mats were found near the river mouth at Rocky Point St. Park boat ramp (39.24886 -76.40307). The filamentous algae was identified as Enteromorpha sp., a green, non-HAB taxa. The confirmation of filamentous algal biomass in the river supports the conclusion that the clumps of floating material observed by boaters on Friday, 3/18 was filamentous algae. A likely scenario is that the combination of extreme low and high tides with the full moon and high winds from passing weather fronts, resulted in water column inversion (deep water migrating to the surface), causing disturbance of the river bottom that resulted in the algae detaching from the bottom substrate and floating to the surface. These combined events of water column inversion and extreme tides also support the hypothesis that the fish kill occurred when a school of gizzard shad became trapped and disoriented in a body of hypoxic or anoxic water that migrated into the shallows. Since there was an absence of the typical conditions observed during a sewage spill - gray water, paper pulp, and sewage odor, it seems the hypotheses stated above provide the

best explanation for the cause of the fish kill and the	e occurrence and identity of the floating mats	(unless further evidence proves otherwise).
Kill total or selective: Not total kill		
Condition of doed tiple. Figh appropriation.	Community and the second state of the second s	d
Condition of dead fish: Fish appeared fairly	Symptoms of moribund fish: None obser	rvea.
fresh, with little decomposition, indicating they		
were killed in the last couple days.		
Additional Investigations:		
Agencies (persons) involved:		Phone #
Nicholas Kaltenbach		(443) 482-2710
MDE Compliance personnel also conducting invest		
		*

Investigators:	Date:
calculations/ addt'l notes:	