

Using Benthic Macroinvertebrates to Indirectly Determine Water Quality

QWA

Charles Katona and Dr. Rebecca Urban

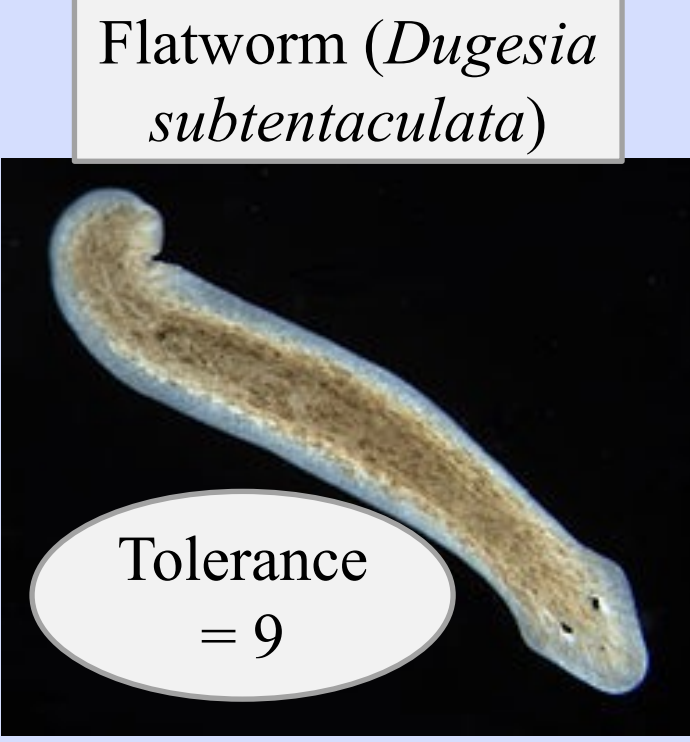
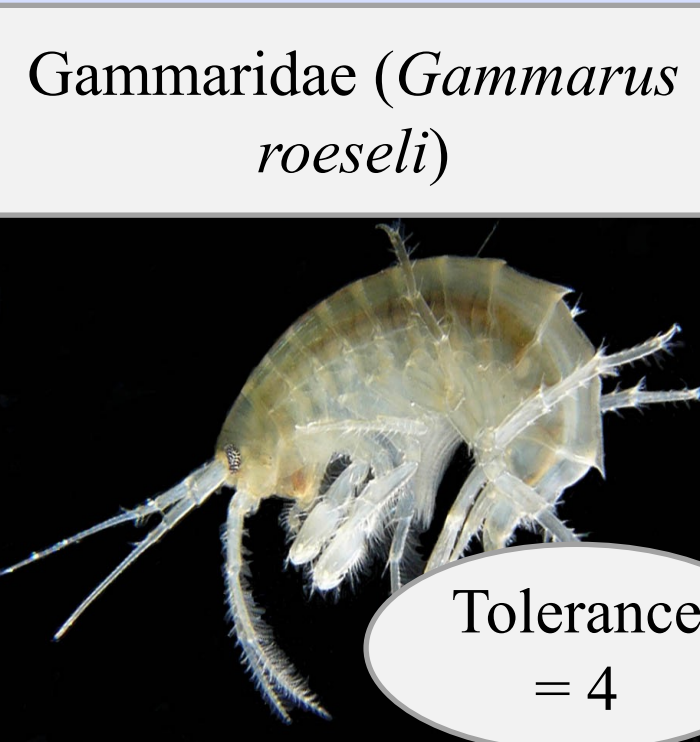
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Introduction

- Pollution levels are a critical concern for watershed health, particularly in systems that provide sustainable drinking water to their surrounding communities. Freshwater benthic macroinvertebrates serve as bioindicators of stream water quality due to their varying pollution tolerances (Ojija & Laizer 2016). The Quittapahilla Creek Watershed Association conducts annual assessments at six stream sites as part of a long-term monitoring protocol to evaluate the success of restoration efforts. Historically being considered unrecoverable, the watershed has shown notable improvements in water quality in recent years.

Examples of Species and Tolerance Levels

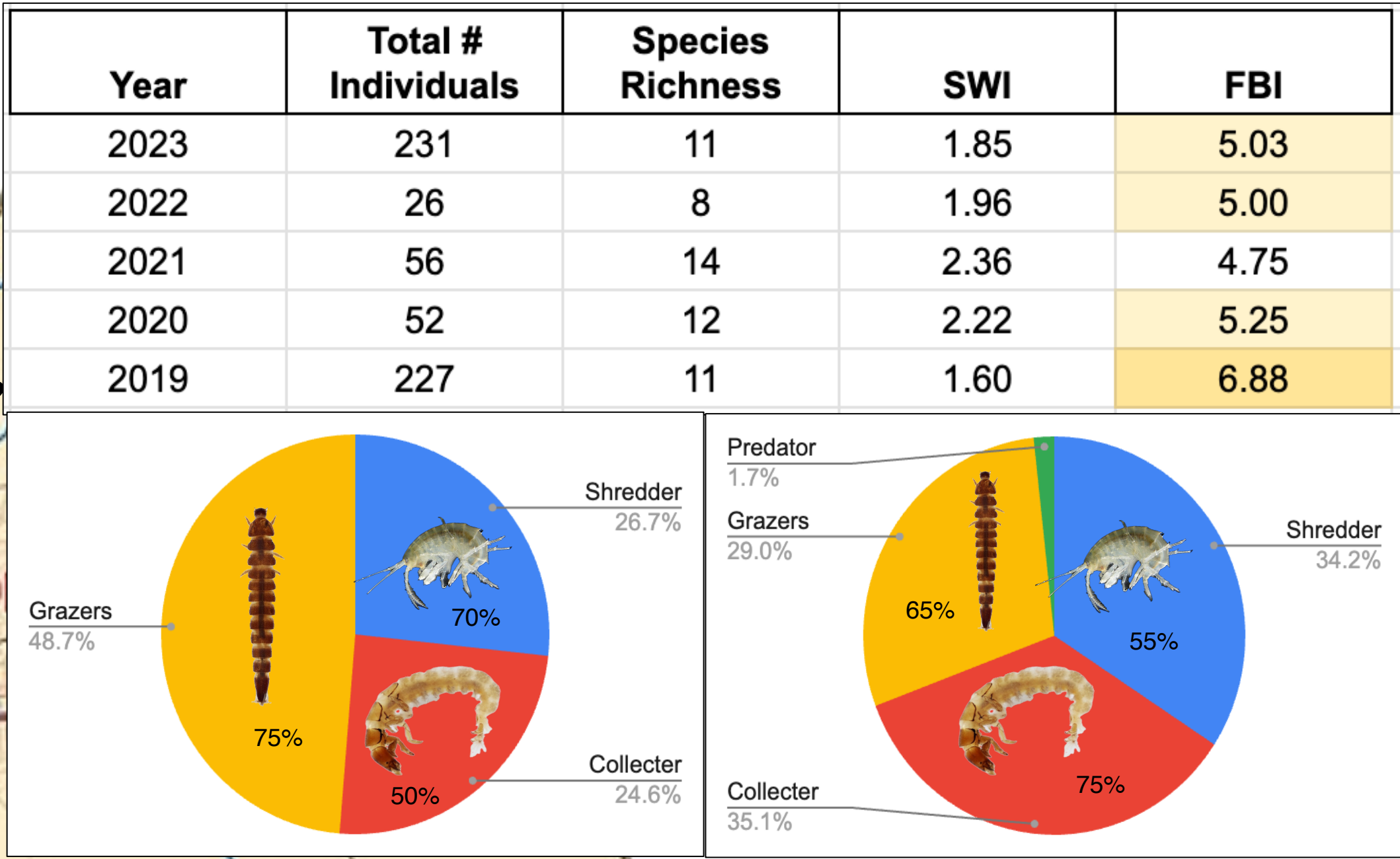
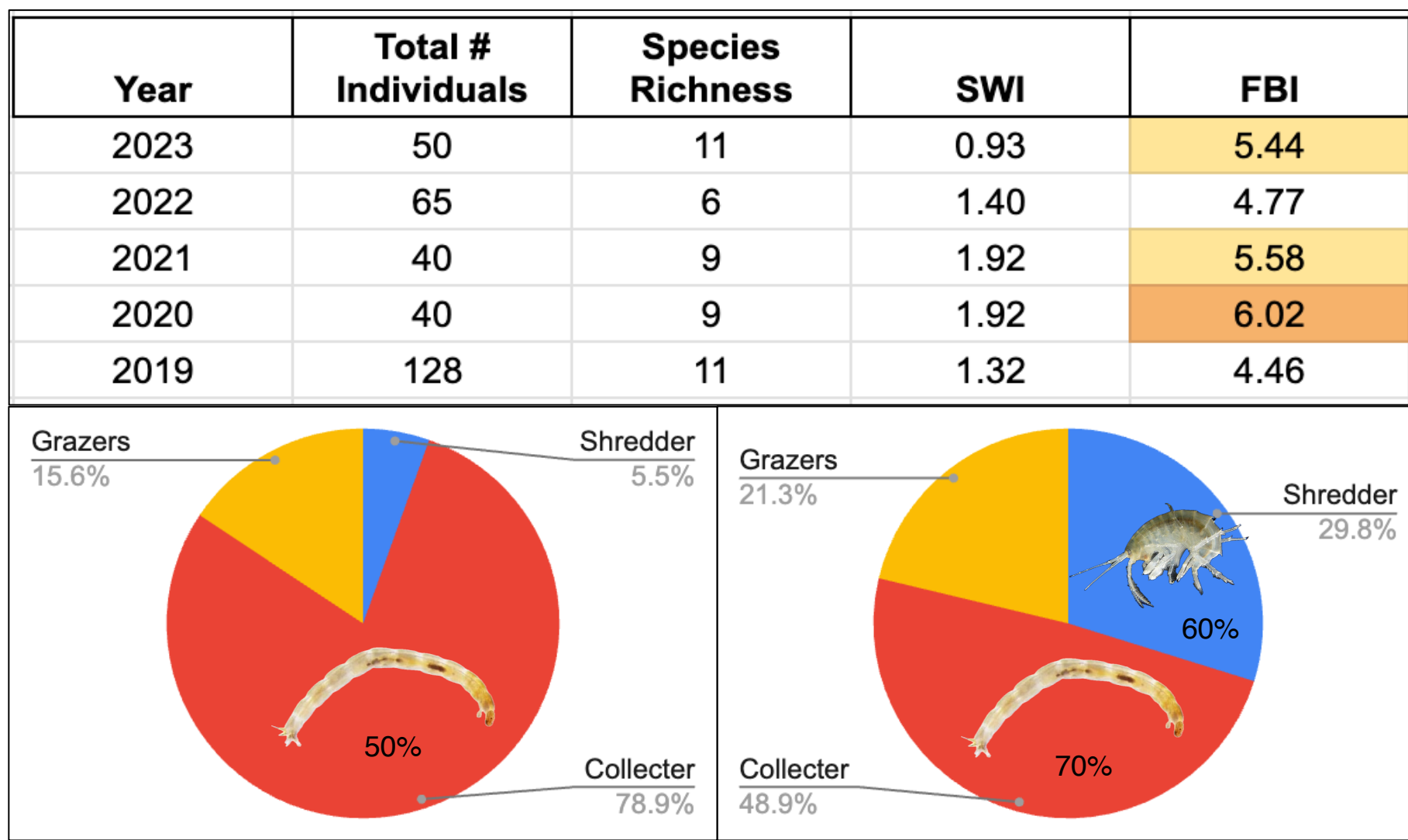
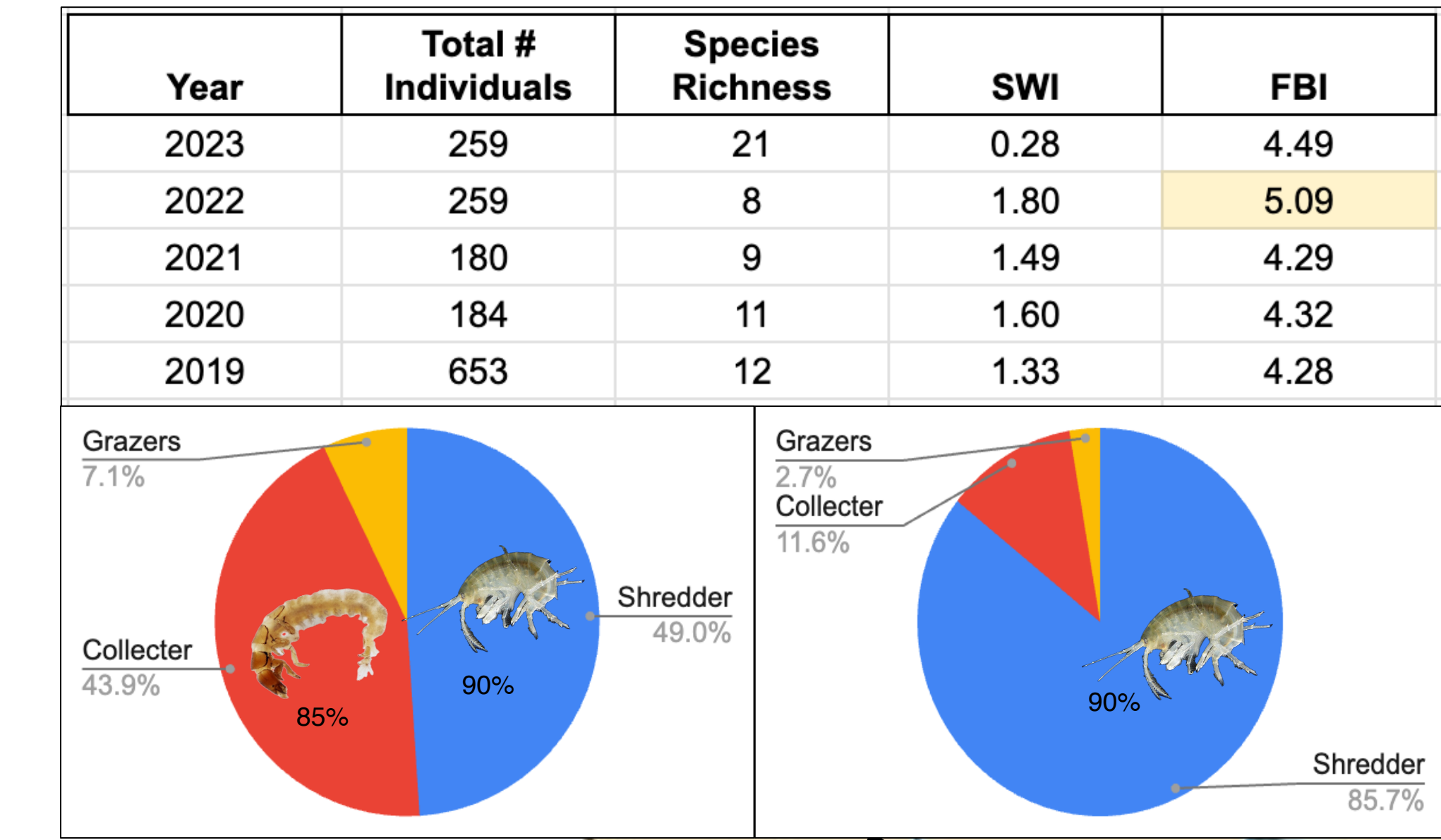
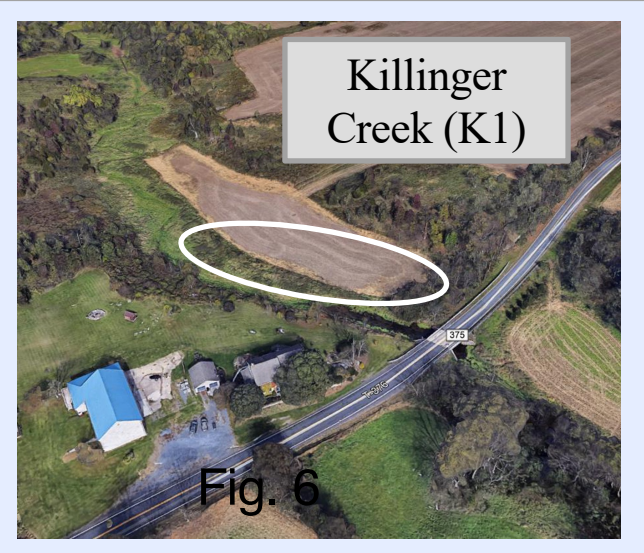
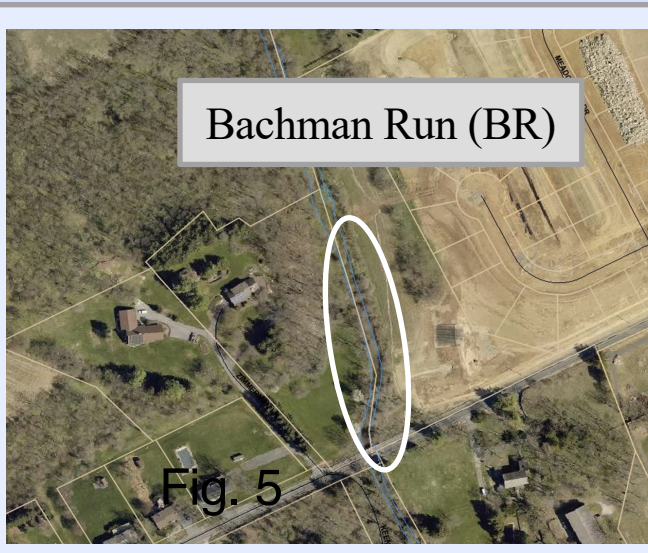
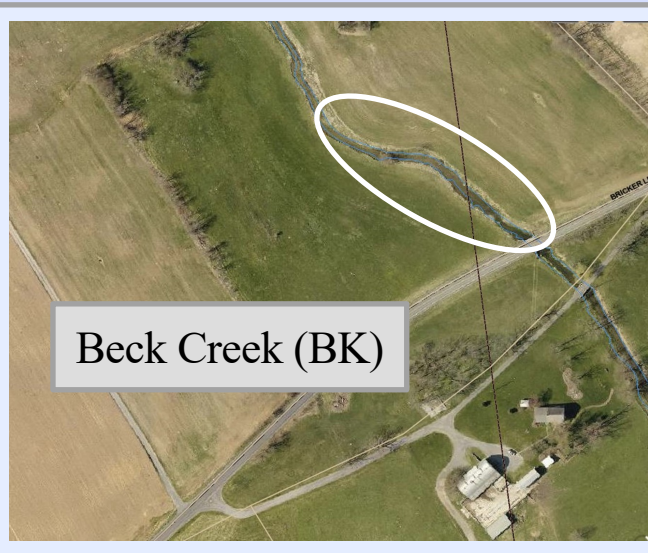
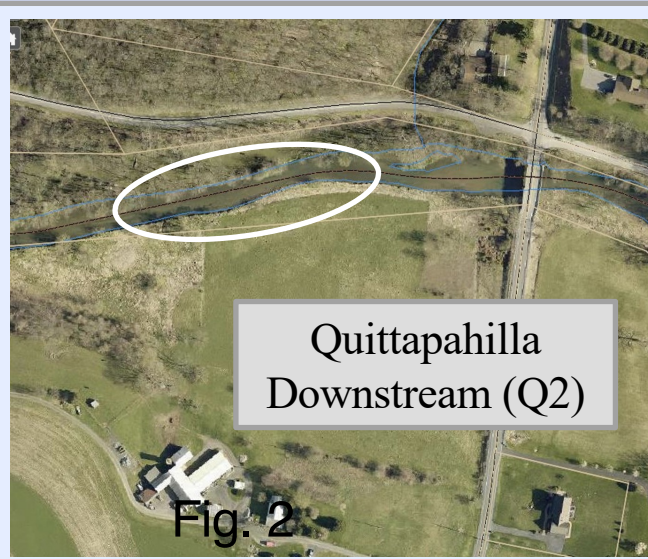


Methods

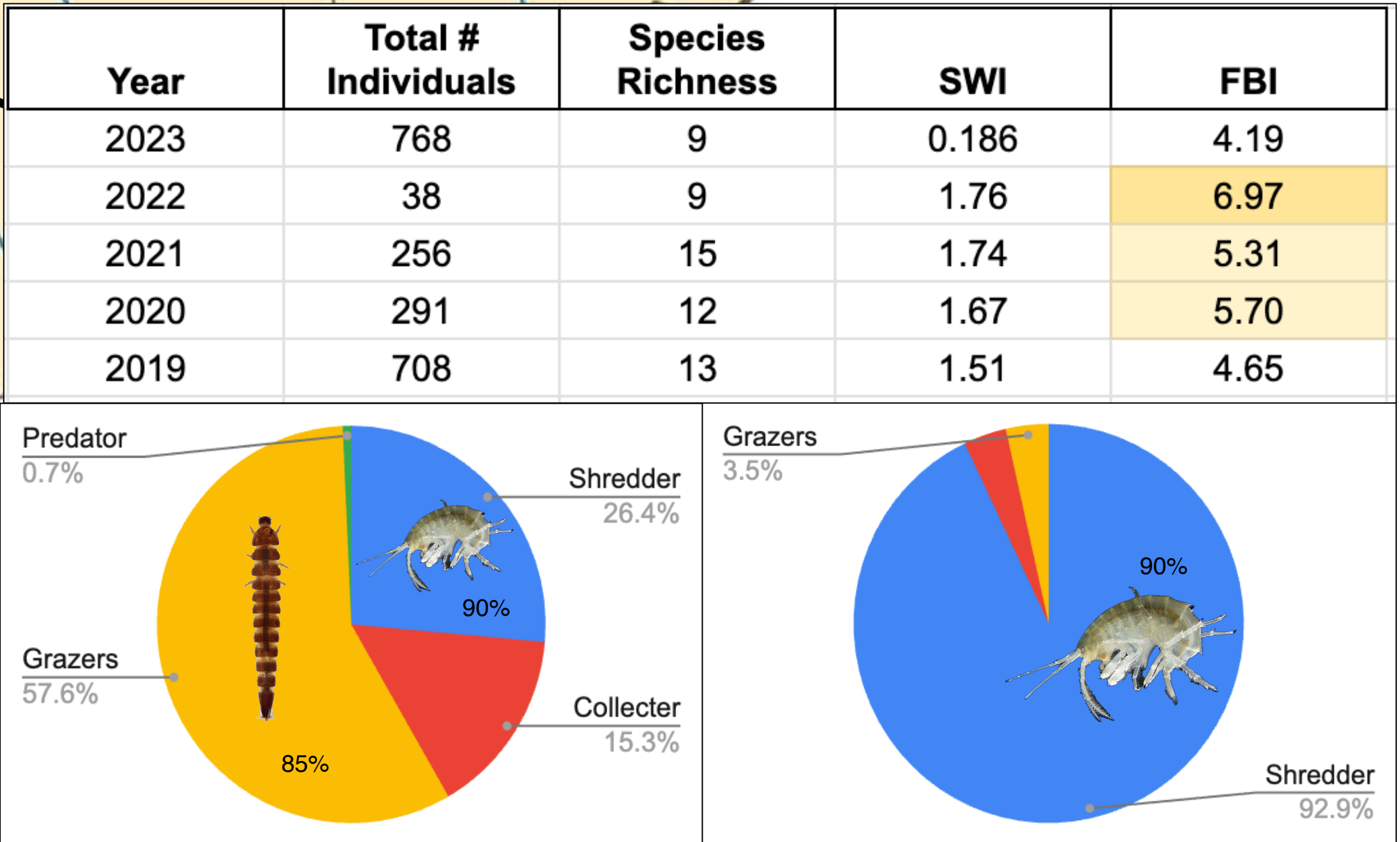
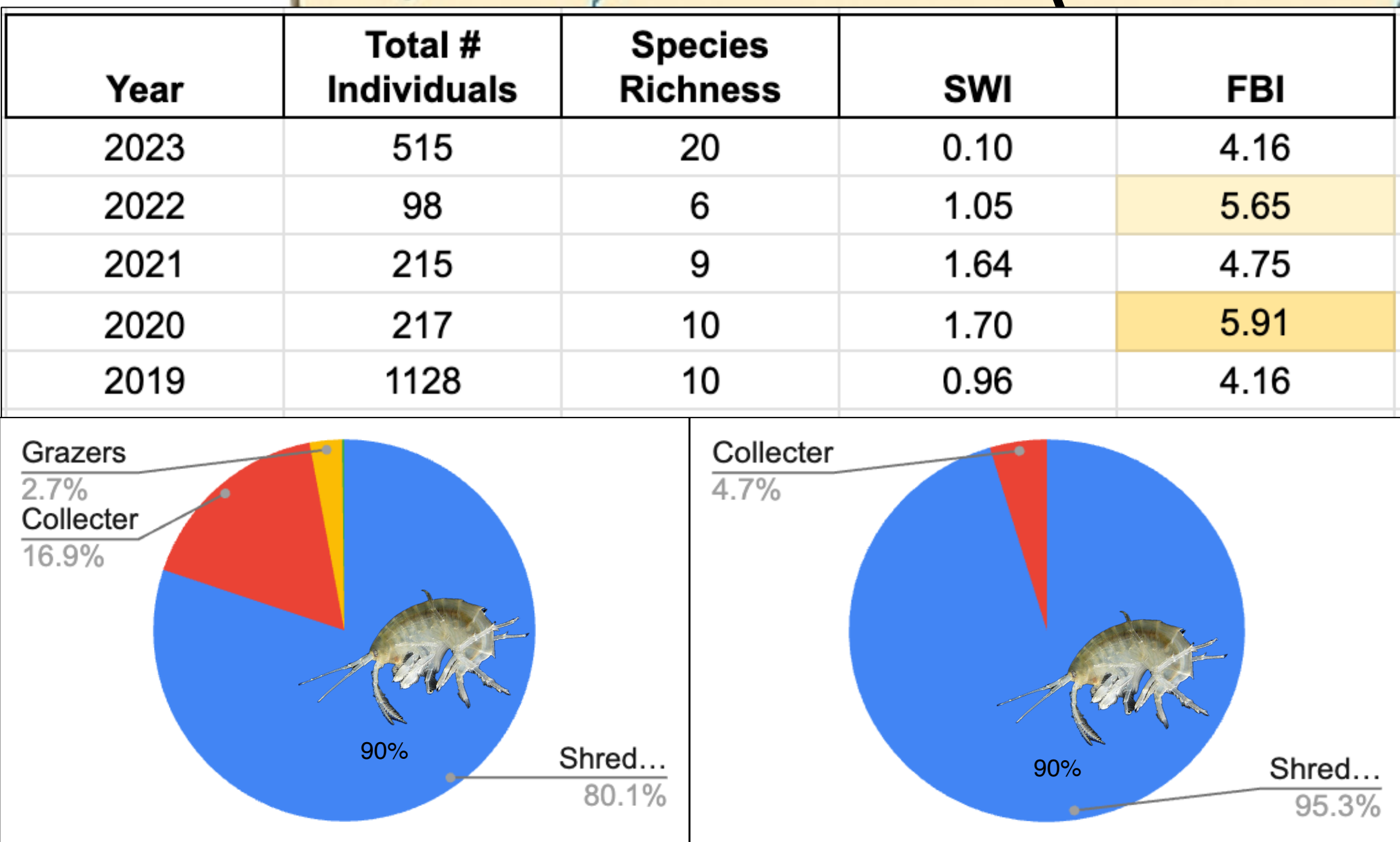


Sampling Sites

Circles are the sampling reach



Year	Total # Individuals	Species Richness	SWI	FBI
2023	X	X	X	X
2022	275	19	1.12	2.63
2021	640	6	1.78	6.39
2020	626	15	1.70	7.12
2019	X	x	X	X



Discussion

- Site Q1 had the highest Family Biotic Index and lowest SWI, indicating the lowest water quality. This is due to the large number of Chiromidae, a collecting feeding group species. We recommend restoration efforts upstream of this sampling location.
- Other restoration projects are also being conducted by the QWA, marked on the map with full red circles, focusing on water purification
- It is worth noting the increased numbers of # individuals in 2019 and 2023. These years, volunteers with more sampling experience provided their expertise. Dr. Urban led sampling efforts in 2019, and Tony Shaw (retired PA DEP) in 2023.
- K1 dried up in 2023 but has since returned for 2024 sampling
- QWA and Dr. Urban will conduct another annual macroinvertebrate collection next fall

Literature

Ojija, Fredrick, and Hudson Laizer. "Macro Invertebrates As Bio Indicators Of Water Quality In Nzovwe Stream, In Mbeya, Tanzania." *International Journal of Scientific and Technology Research* 5.6 (2016): 211-222.

Acknowledgments

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