Rate of Pre-Spawn Mortality of Coho Salmon in Swan Creek

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Introduction

Figure 1. Weighing mass (kg) of deceased Coho

- Coho salmon *(Oncorhynchus kisutch)* suffer from PSM in Swan Creek, Puyallup WA.
- Pre-spawn mortality, or PSM is a phenomenon that occurs in salmon located in urban waterways from highway runoff.
- Stormwater (highway) runoff consists of many compounds from chemicals in vehicles and other man-made debris (Feist et al. 2017).
- PSM results in salmon dying before spawning, which will ultimately affect their population.

Study Site and Methods

- PSM rates were surveyed from 2017-2021 at Swan Creek in Puyallup, WA (Fig. 1).
- Annual escapement values were recorded from 2017-2022.

Figure 2. Map of Swan Creek in Puyallup, WA. Survey site circled in red.

Results

- **The rate of pre-spawn mortality in 2022 was 100%, based on a sample size of 1.**
- **Average rate of PSM from 2017-2022 was 21.1%**

Figure 3. PSM evident female Coho salmon (no signs of predation)

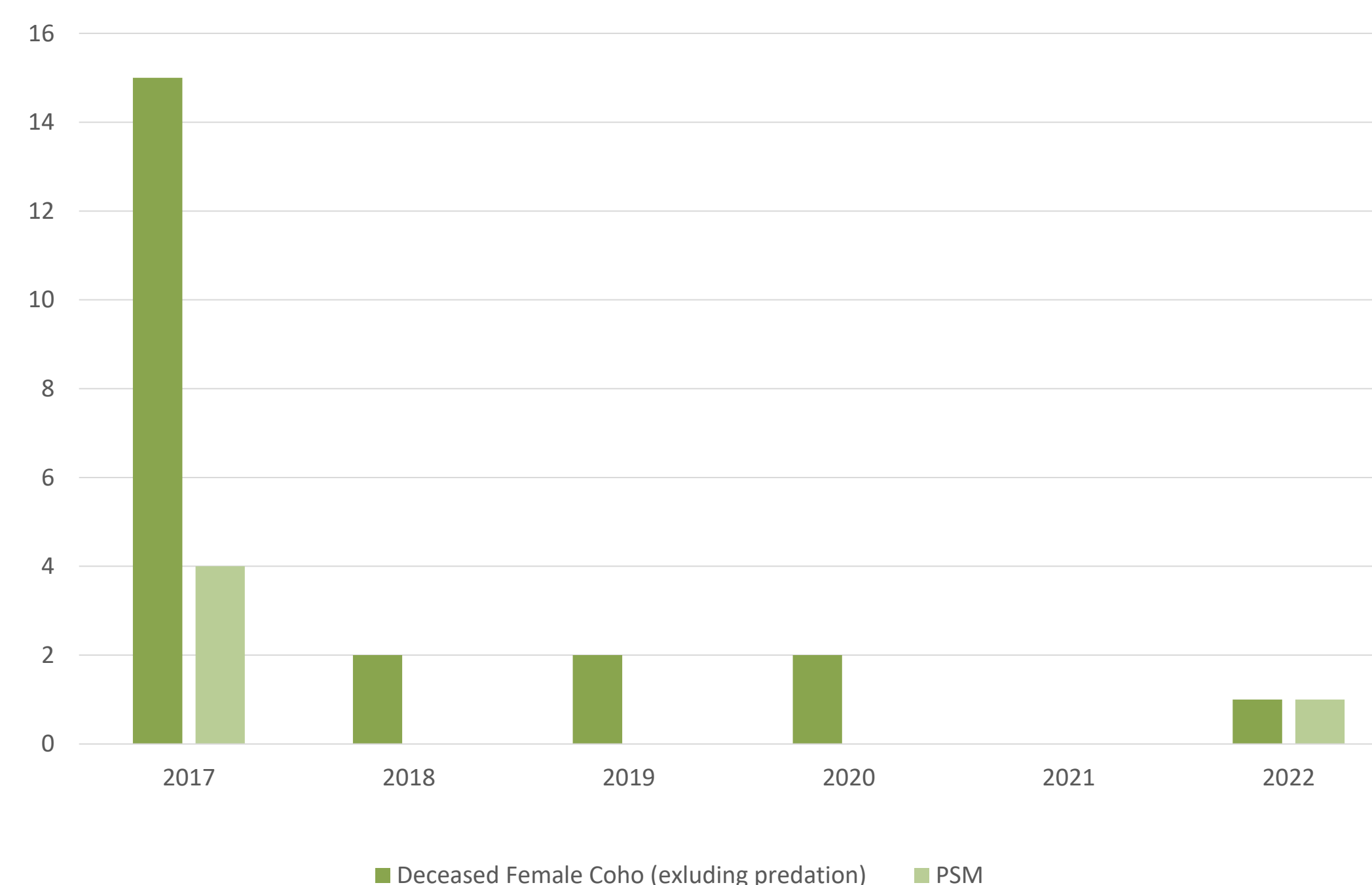Deceased Female Coho (exluding predation)   PSM

Figure 4. Amount of deceased female Coho without signs of physical injury (dark green), & amount of deceased female Coho that had indications of PSM (light green) from 2017-2022.

Table 1. Annual rate of PSM and annual escapement value of Coho salmon from 2017-2022.

Year	Annual Rate of PSM	Annual Escapement Value
2017	26.60%	68
2018	0%	12
2019	0%	10
2020	0%	10
2021	0%	0
2022	100.00%	7

Discussion

Figure 5. Map of Puget Sound showing predicted PSM rate (Feist et al. 2017).

- The predicted mean pre-spawn mortality rate in Pierce County were estimated to be between 10-40% (Feist et al. 2017).
- For 2022 data, Coho PSM rates are higher in Swan Creek than predicted values for Pierce County.
- Bio infiltration is an inexpensive process that filters stormwater runoff before it hits urban waterways. This method prevents all deaths involving stormwater runoff in Coho salmon (Spromberg et al. 2015).
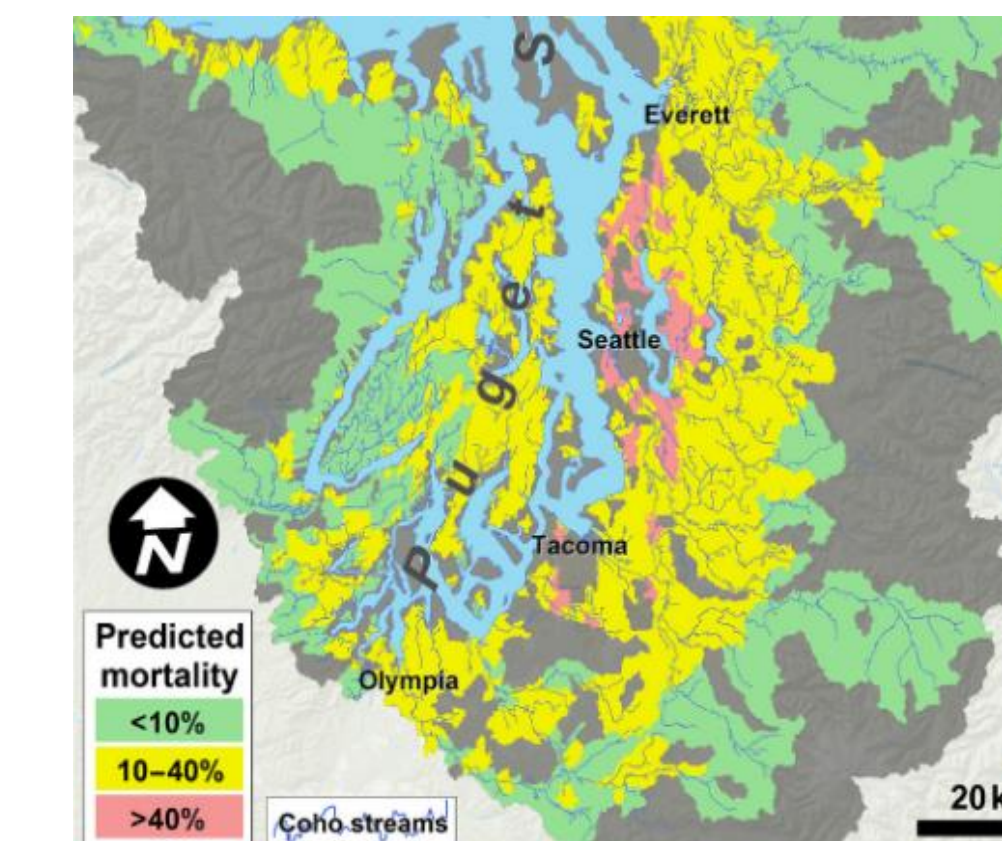
Community Outreach

- Surprise Lake Middle School students contributed with surveying salmon/recording data.
- To date, over 230 community members have participated in this community-engaged research, including 103 middle school students.

Figure 6. Showing students how to record data of deceased Coho salmon.

Acknowledgements

Thank you to my mentor, Erik McDonald. Also, a special thanks to the Puyallup Tribe. I would additionally like to thank the middle school students for all the great work, along with their teacher, Jody Boyd.

References
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