

The Effects of Urban Runoff on Coho Salmon Populations in the Puyallup River Watershed: Swan Creek



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Introduction

- *Oncorhynchus kisutch* (Coho salmon) populations are being heavily impacted by toxic urban runoff, causing mass premature mortality events (Chow et al, 2018)
- A recent study found that a preservative in car tires is causing URMS (Tian et al. 2022).
- Very little is known about the effects of URMS in Pierce County, WA, as research has primarily been conducted in King County.

Site and Study Methods



Figure 1. Map of Swan Creek, Puyallup WA retrieved from MetroPark's website. Survey site outlined in red

- Data was collected annually from 2017-2021 at Swan Creek in Puyallup, WA.
- Counts for all species of live adult salmon (male and female) were recorded during each survey.
- Data for every Coho carcass was recorded:
 - Male or female
 - Signs of predation to rule out PSM.
 - >50% egg retention to identify spawning
- Caudal (tail) fins were removed from each carcass to avoid re-counting.

Data

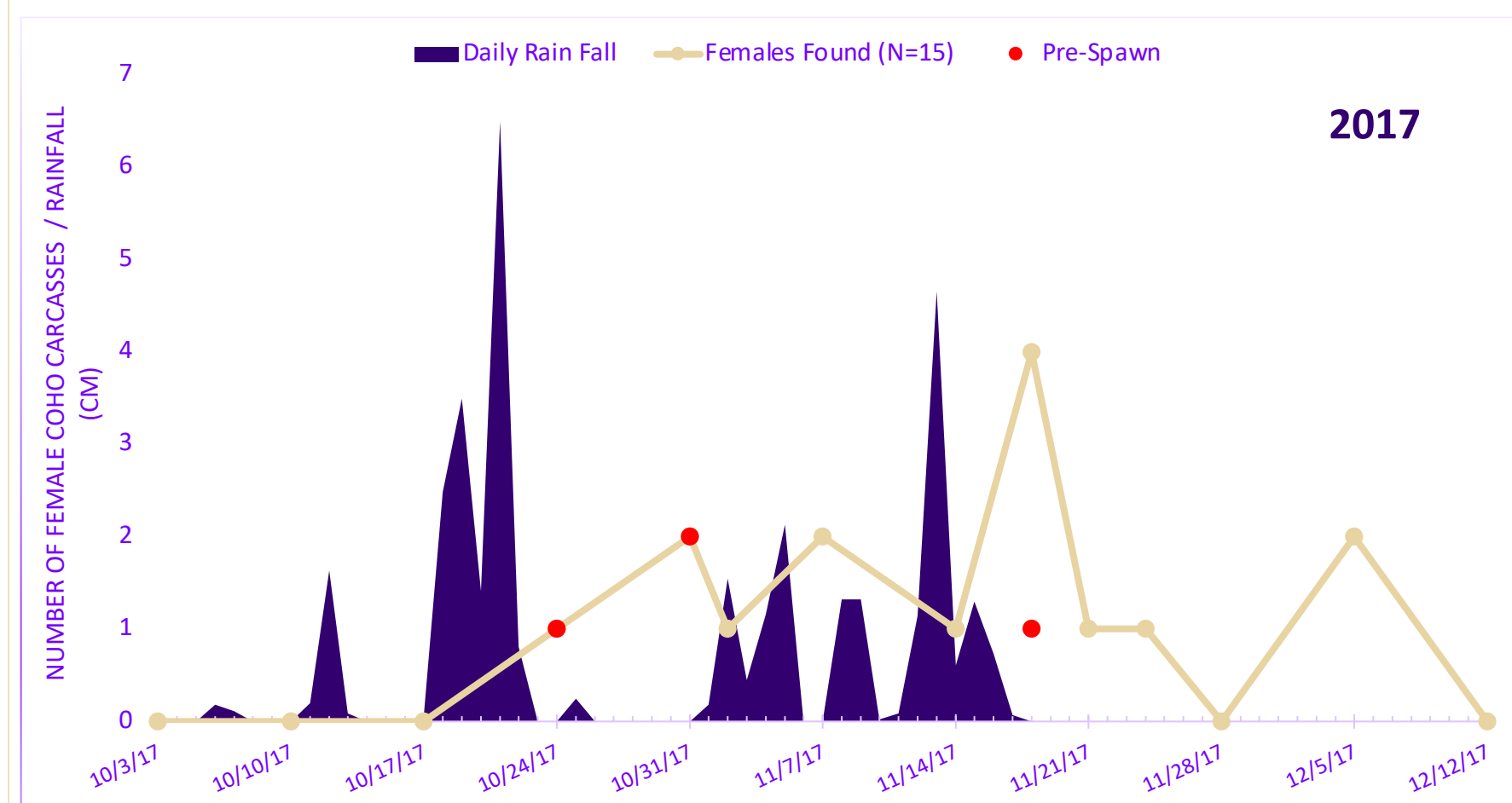
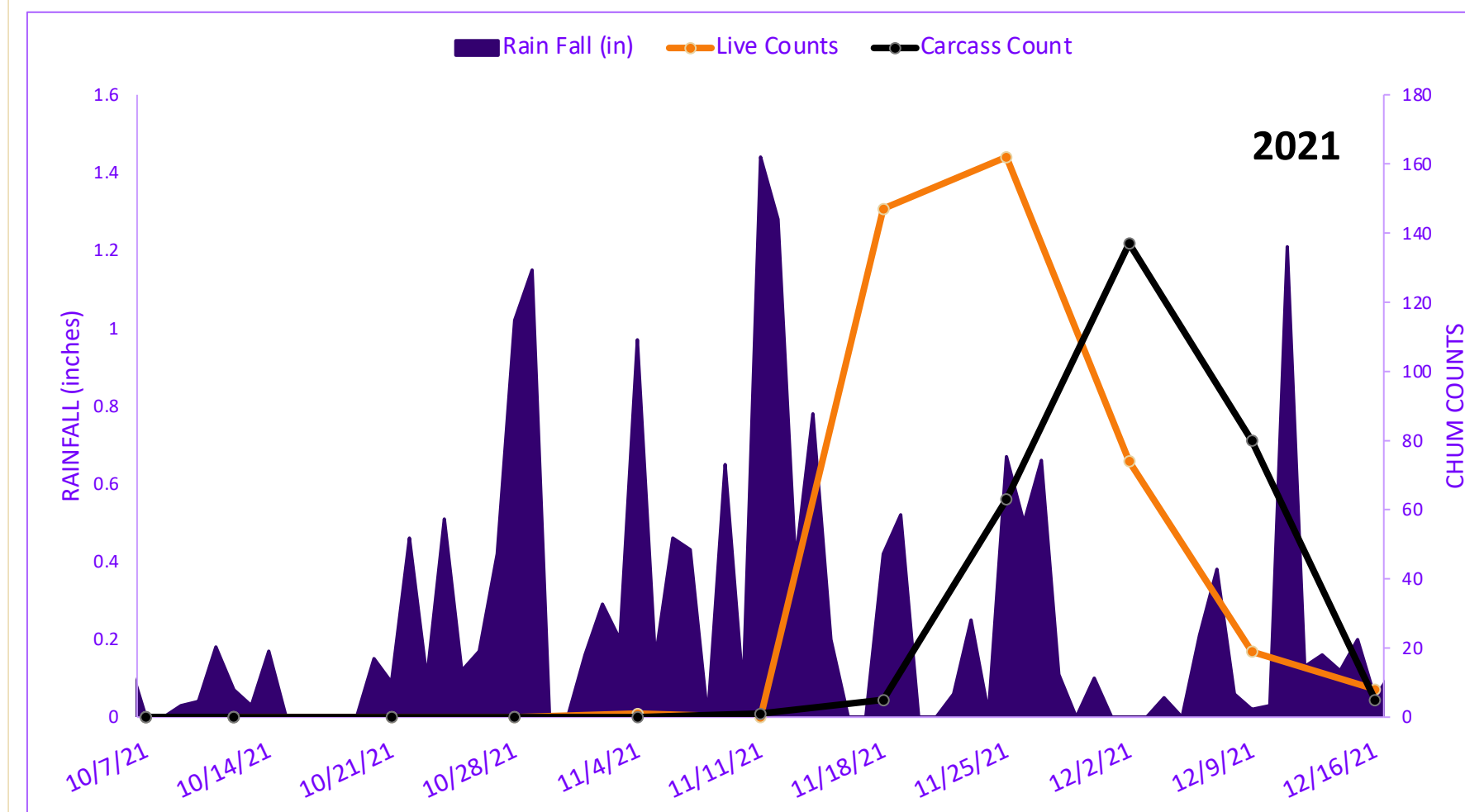


Figure 2. 2017 spawning season incidents of pre-spawn mortality found in Coho (Brockman, 2017).



Results

Annual (2021) Coho PSM Rate	Average Coho PSM Rate (2017-2021)	Annual (2021) Escapement Value
0.0	0.8	285

Table 1. Annual PSM rates for 2021, Average PSM rates for 2017-2021, annual escapement value for 2021.

Discussion and Conclusion

- Average PSM rates over the 5-year span (Table 1) are nearly twice that suggested in previous studies which predicted rates to be between 10-40% (Feist et al. 2017).
- Higher PSM rates are closely correlated with increased human population density and transportation infrastructure (Feist et al. 2017).
- Bioretention is amongst the most promising technologies when considering regulatory efforts for reducing PSM rates (Spromberg et al. 2015).



Figure 4. Pre-Spawn Mortality female Coho Salmon.

Community Outreach and Education

- Collaborations with Surprise Lake Middle School and the Pierce Conservation District were organized to create educational outreach opportunity for middle school students (7th grade).
- The Puyallup Tribe fishery donated a Pre-Spawn Mortality female Coho to be used for an in-class lecture and dissection.
- Students were invited to join us in the field to apply the skills learned during classroom visits in previous weeks
- Since 2017, our educational outreach initiatives have reached a total of 109 community members.

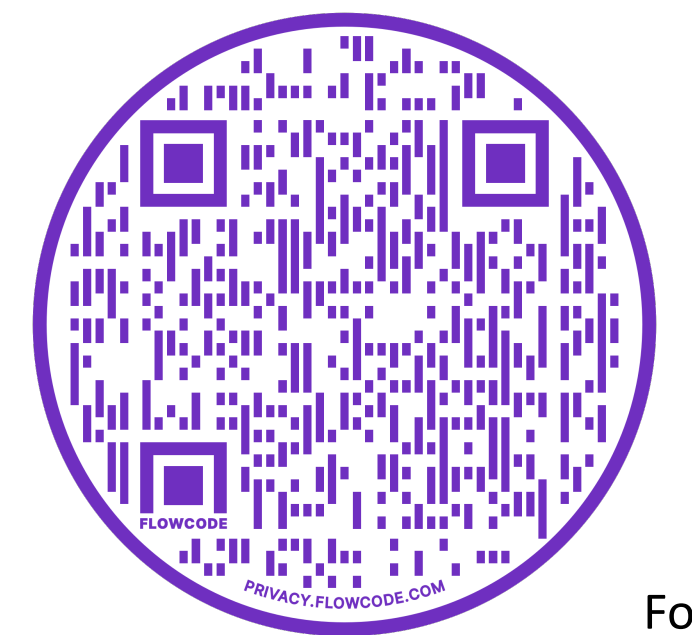


Figures 5-7. Community outreach and education events with local community members and 7th grade students from Tacoma Public Schools.



Acknowledgments

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For more information