Middle Rogue Pesticide Stewardship Partnership, 2021 Summary

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Introduction

The Middle Rogue Pesticide Stewardship Partnership (MRPSP) was established in 2014 as part of the Oregon Department of Agriculture's statewide effort to monitor water quality, particularly in connection to agricultural practices. Each year the MRPSP team collects water samples, which are analyzed by the Oregon Department of Environmental Quality. MRPSP uses the results to identify pesticides of interest and concern; assess their use; and inform outreach and education efforts about water quality and pesticide use with MRPSP's stakeholders. Stakeholders include agricultural applicators; state and county agencies; irrigation districts; landscape contractors; public and private forestry managers; urban residents; industrial and commercial operations; and municipalities. The goal of the MRPSP is to reduce the frequency of detection and concentrations of pesticides within the monitored watersheds.

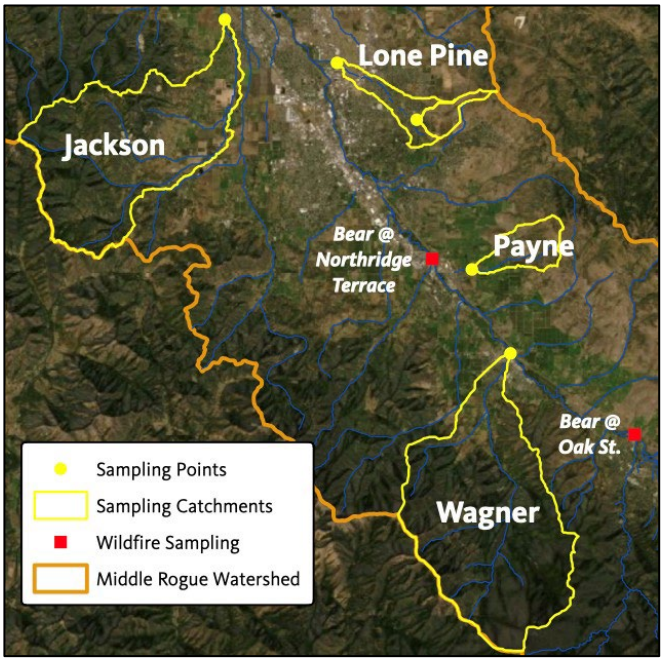

Figure 1: 2021 MRPSP sampling locations. Regular sampling occurred on 12 dates February-October. Wildfire response samples were collected in March and April.

Terms to Know

Aquatic Life Benchmark: a research-derived concentration of a given chemical which is found to be harmful to aquatic organisms. The aquatic life benchmarks used are developed by the Environmental Protection Agency (https://bit.ly/EPAaqualife).

Detection Frequency: the proportion of samples in which a given chemical was detected within a given year.

Pesticide of Concern: a pesticide identified to occur at concentrations approaching or exceeding Federal, State, or Tribal human health standards or aquatic life benchmarks.

Monitoring

In 2021 the MRPSP collected water samples from four tributaries of Bear Creek: Jackson Creek, Lone Pine Creek, Payne Creek, and Wagner Creek (Figure 1). In response to the 2020 Almeda fire and associated recovery efforts, additional sampling events took place on Bear Creek at two locations (Figure 1). Water samples were collected February to October.

Results & Interpretation

During the 2021 sampling season, the MRPSP detected 16 chemicals in four watersheds, for a total of 151 detections. Of those 16 chemicals, most were detected infrequently and at less than 10% of their aquatic life benchmarks.

However, diuron remains a pesticide of concern because of its detection frequency as does imidacloprid because of benchmark exceedances. Diuron was found in Jackson, Lone Pine, and Bear Creeks. The frequency and concentration of imidacloprid and metsulfuron-methyl detections in Lone Pine Creek continue to cause those materials to be classified as pesticides of concern for 2022 (Table 1).

Table 1: MRPSP pesticides of concern. Bars in the detection frequency column indicate annual values 2016 - 2021.

Compound	Selected Trade Names	# of Detections	Detection Frequency (%)		Number of Aquatic Life Benchmark Exceedances
Imidacloprid (Insecticide)	*Admire, Gaucho*	**11**	**18**		**11**
Metsulfuron-Methyl (Herbicide)	*Escort, Ally*	**11**	**20**		**0**
Diuron (Herbicide)	*Karmex, Direx, Kovar*	**14**	**25**		**0**
Oxyfluorfen (Herbicide)	*Goal, Goaltender, Galigan*	**1**	**2**		**0**

There was one detection of oxyfluorfen during the 2021 sampling season. This is a significant detection frequency reduction following the 2014 - 2019 seasons and may be the result of MRPSP reconnaissance sampling and targeted outreach to landowners near Jackson Creek in 2019. If oxyfluorfen detections remain minor in 2022, then it will be declassified as a pesticide of concern in 2023.

Of the four sampling watersheds, our newest, Lone Pine Creek, which we began sampling in 2020, accounted for 100% of benchmark exceedances and 91% of all chemical detections, but just 36% of all samples collected in 2021. These rates highlight Lone Pine Creek as an important watershed to better understand land-use and pesticide application. We have begun to reach out to landowners in the area and plan on further sampling in 2022.

Conclusion

As our dataset continues to grow, MRPSP partners have been able to identify the most common and concerning pesticides in the Bear Creek Watershed. The MRPSP has led meetings with applicators of these compounds to discuss application strategies that will result in reduced pesticide drift and runoff, and is working to develop further communication materials and strategies for the users of these chemicals. The intention of pesticide monitoring is that applicators, the public, and research scientists will better understand how and why certain pesticides accumulate and move through our local watersheds. The MRPSP will continue to offer education, technical assistance, and incentives for the adoption of best management practices to address users' needs while reducing or eliminating pesticide contamination of surface waters.

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