

Yamhill River Basin and Pesticide Stewardship Partnership FACTSHEET



Oregon Department of Agriculture | Oregon Department of Environmental Quality
Greater Yamhill Watershed Council | Yamhill Soil and Water Conservation District

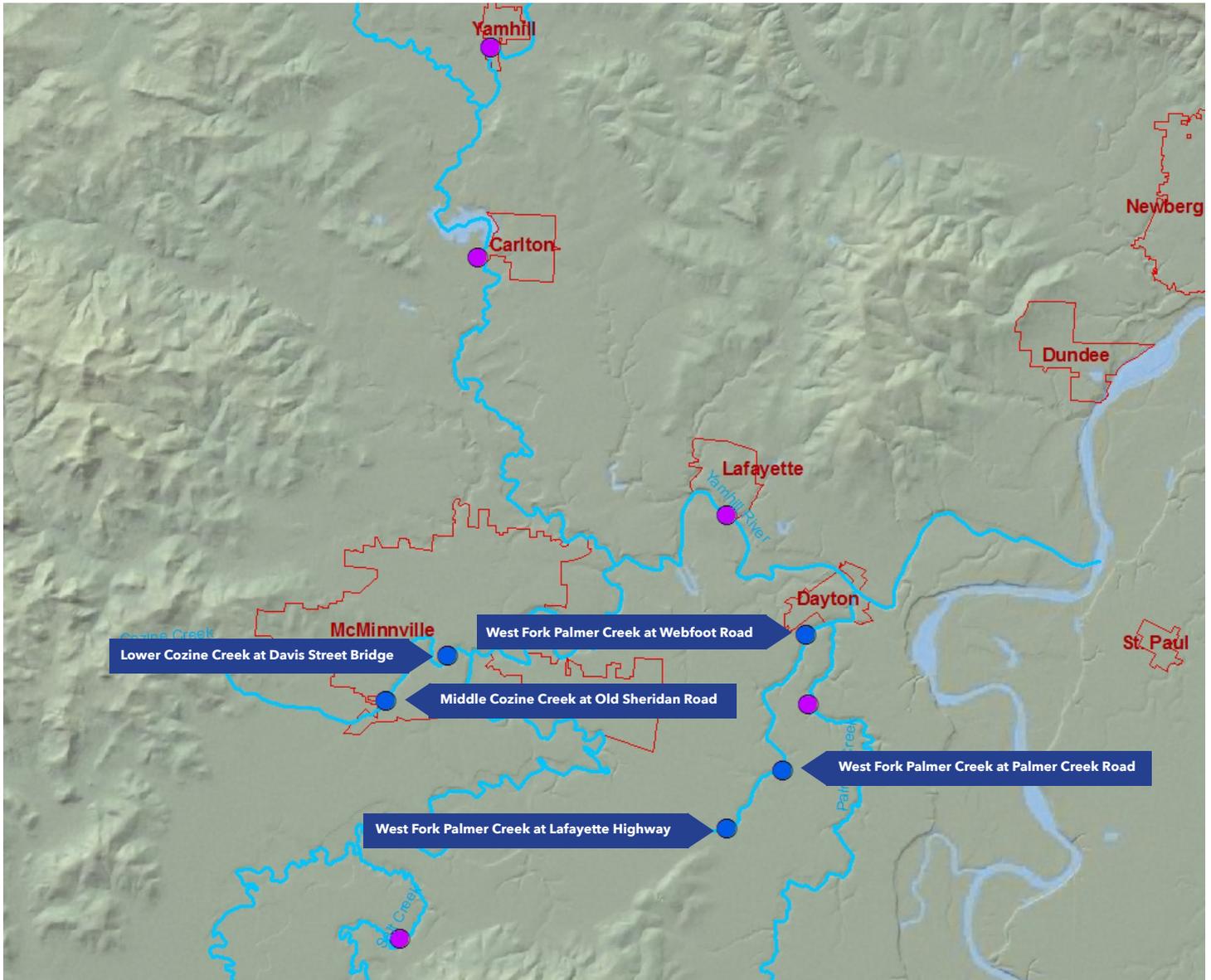


Figure 1: Pesticide Stewardship Partnership sampling sites in the Yamhill River Watershed. Blue dots are currently monitored PSP sites, and pink dots are historically monitored PSP sites.

The Yamhill River Basin and the Pesticide Stewardship Partnership

The Yamhill Sub-basin in the Willamette Valley is a diverse and dynamic watershed. Land use is approximately 56% agriculture, 38% forestry, 4% rural residential and 2% urban. Pesticides are used in each of these land uses to control insect pests, plant diseases and weeds. Agricultural land uses in the Yamhill River Basin include nurseries, grass seed, nut orchards, berries, wine grapes, and various row crops and pesticides are often used to control pests or weeds that can adversely affect crop quality and yields. In addition, urban areas in

the Basin are experiencing rapid growth. Pesticides are used in the management of lawns, gardens, transportation rights-of-way, municipal parks, golf courses and landscaping activities in these urban areas.

Pesticides can enter surface waters in the Basin through rain-caused runoff, through storm water runoff overland flow across impervious surfaces (e.g., roadways) into storm drains that directly discharge to surface waters, or from airborne drift. This off-target movement can affect water quality and

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The maximum number of pesticides found in a single sample

has the potential to adversely impact fish and other aquatic life.

Several groups work to protect the Yamhill River watershed's resources and to understand how application of pesticides may impact water quality, particularly for aquatic life and habitat. The Yamhill Pesticide Stewardship Partnership was started in 2007 as a collaboration between state agencies and the Greater Yamhill Watershed Council, Yamhill Soil and Water Conservation District, and Oregon State University Extension.

The state's Pesticide Stewardship Partnership (PSP) program uses local expertise combined with monitoring to encourage voluntary changes in pesticide use practices. The program includes collaborative monitoring, information-sharing and problem-solving efforts. The PSP approach has proven to be very successful at reducing pesticide concentrations in surface water in the Hood River, Mill Creek (The Dalles)

Sampling results

Prior to 2009, DEQ's monitoring focused primarily on organophosphate insecticides (e.g., chlorpyrifos, malathion). In 2009, the number of pesticides tested expanded to over 100 pesticides and breakdown products. While very few of those pesticides have water-quality criteria, most have benchmarks developed by EPA's Office of Pesticide Programs. These benchmarks are used to help assess the relative potential impact of a pesticide and to prioritize resources. Water sample analysis has identified several pesticides that occur frequently at multiple monitoring sites in the Yamhill Sub-Basin. In addition, benchmark exceedences of Chlorpyrifos and Diuron were detected each year at the Webfoot Road site along West Fork Palmer Creek. This led to the 2014 addition of two additional upstream sites in West Fork Palmer Creek. Table 1 lists the chemicals detected at the five current monitoring sites in 2014 with elevated concentrations relative to benchmarks or over 50% detection

and Walla Walla Basins. The PSP approach has been adapted to address the complexity of diverse crops and urban and agricultural land uses in the Willamette Valley. As well, the co-occurrence of pesticides in water samples (mixtures) may result in potentially greater impacts to aquatic life than a single pesticide, on its own.

When PSP monitoring started in the Yamhill, a wide net was cast by monitoring eight sites: West Fork Palmer Creek, Cozine Creek (two locations), Yamhill River (Lafayette Locks Park), East Branch Palmer Creek (Stringtown Road), Yamhill Creek (in Yamhill), North Yamhill River (Wenneberg Park, Carlton), Salt Creek (Amity) (Figure 1). The data showed higher concentrations and frequencies of detection in the Cozine Creek and West Fork Palmer sites, so monitoring has recently focused in those areas. In 2014, two (2) additional upstream sites were added on the West Fork Palmer Creek to better inform outreach efforts in the watershed.

frequency. Chemicals in red bold were detected over aquatic life benchmarks or Oregon water quality criteria.

Prior to 2009, of the 17 pesticides analyzed, all were found in Cozine and West Fork Palmer Creeks. When the analytical capability of the lab increased to over 100 analytes in 2009, more pesticides were detected, Forty-two pesticides were detected in 2014, often at very low concentrations. Diuron has been commonly detected in Cozine and West Fork Palmer Creeks since it was added as an analyte in 2009, and it was found in every sample in 2014. In 2014, Diuron was detected in WF Palmer at Webfoot Road at the unusually high concentration of 88.8 ug/L. Atrazine, simazine and the triazine degradates, deisopropylatrazine and desethylatrazine, were commonly found at low levels in all five of the Yamhill basin sites from 2009-14. During 2011-2014, as many as 19 pesticides were detected in single samples taken from WF Palmer Creek.

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The number of detected analytes

EPA Office of Pesticides recently revised its atrazine and simazine aquatic life benchmarks. Currently, the lowest benchmarks (for vascular plants) for atrazine is 0.001 ug/L (from 1.0 ug/L) and for simazine is 2.24 ug/L (from 36 ug/L). The triazine degradate benchmarks did not change. Oregon's interagency Water Quality Pesticide Management Team, along with other states, is currently reviewing the revised atrazine and simazine benchmarks to determine whether to apply them to monitoring results in the state

In addition to the base suite of pesticides, glyphosate, its degradate AMPA, and a suite of 17 phenoxy herbicides were analyzed during 5 sampling events (n=25 samples)

SELECTED PRIORITY PESTICIDES CURRENTLY USED IN YAMHILL DURING THE 2014 PSP MONITORING PROGRAM (APRIL-OCTOBER 2014)

Pesticides detected, detection frequency and number of benchmark exceedances

| TYPE | ANALYTE | TRADE NAME EXAMPLE | DETECTION FREQUENCY | # OF BENCHMARK EXCEEDANCES |
|-------------|-----------------------------------|--------------------------------------|---------------------|----------------------------|
| Herbicide | Atrazine | Aatrex | 48 | 1 |
| Herbicide | Simazine | Princep, Sim-Trol | 86 | 0 |
| Herbicide | Deisopropylatrazine | Atrazine/Simazine/Triazine degradate | 88 | 0 |
| Herbicide | Desethylatrazine | Atrazine/Simazine/Triazine degradate | 50 | 0 |
| Herbicide | Dichlobenil | Casoron | 26 | 0 |
| Herbicide | 2,6-Dichlorobenzamide | Dichlobenil degradate | 86 | 0 |
| Herbicide | Diuron | Direx, Karmex | 100 | 8 |
| Herbicide | Glyphosate | Touchdown Pro, Accord, Alecto | 87 | 0 |
| Herbicide | Aminomethylphosphonic acid (AMPA) | Glyphosate degradate | 100 | 0 |
| Herbicide | Metribuzin | Axiom, Boundary, Metador, TriCor | 55 | 0 |
| Herbicide | S-Metolachlor | Pennant Magnum | 50 | 0 |
| Insecticide | Bifenthrin | Brigade, BiThor, Atera, Benefit | 2 | 1 |
| Insecticide | Carbaryl | Sevin | 1 | 0 |
| Insecticide | Chlorpyrifos | Lorsban | 17 | 4 |
| Insecticide | Diazinon | Diazinon, Corathon | 5 | 0 |
| Insecticide | Dimethoate | Dimate, Dimethoate | 7 | 1 |

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Table 1: Pesticides in the Yamhill River watershed measured at concentrations exceeding benchmarks, or over 50% detection frequency.

Many of these included one or more triazine herbicide or degradate and the organophosphate insecticide, chlorpyrifos. Synergistic effects on aquatic life have been demonstrated for such mixtures. Methomyl, a carbamate insecticide, was detected seven times in 2013, once over

the benchmark, but was not detected in other years. Dichlobenil and its degradate 2,6-dichlorobenzamide, metolachlor, and metribuzin were found in all 5 Yamhill basin sites in over 50% of the samples taken in 2014, all at levels less than 10% of the relevant benchmark.

How are partners collaborating on solutions?

In 2014 and 2015, the PSP program funded and organized pesticide waste collection events around the state. By far, the largest event was in McMinnville on December 6, 2014, in the Yamhill Basin. There were 39,218 lbs of waste collected from 54 participants. These are old "legacy" pesticides and unusable current use chemicals that will no longer pose risks to surface and groundwater in the Yamhill Sub-Basin. Additionally, approximately 1000 pounds of empty, triple-rinsed pesticide containers were collected for recycling. The Greater Yamhill Watershed Council and Yamhill SWCD were instrumental in publicizing and organizing this event.

In 2014, the PSP program funded the purchase of a demonstration "Tunnel Sprayer," which was loaned to the Yamhill SWCD. The tunnel sprayer is

a retrofit to a standard air blast sprayer designed to reduce off-target movement of pesticides on small or trellised fruit. Vineyard testing shows that it can reduce pesticide drift by up to 99% and reduce chemical usage (and purchases) by up to 35%.

The PSP program has also provided grant funds for pesticide user technical assistance in the monitoring areas. Funds received by Salmon Safe will be directed to multiple PSP watersheds, including the Yamhill to engage agricultural landowners in identifying and implementing solutions that reduce priority pesticides in local waters. The project also will engage urban pesticide users in environmentally innovative stormwater management, fish-friendly landscaping, and other stewardship activities.

For more information and technical assistance

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