Stemlit Creek

APRIL 2021

Summary of 2019 Surface Water Monitoring Program Results

DDT was widely used in orchard production until it was banned in the U.S. in 1972. It is still detected in the Stemilt Creek watershed due to the pesticide's strong soil binding abilities, combined with soil erosion into the adjacent stream. Staff collected samples at Stemilt Creek only during early spring due to historically few pesticide detections during the late spring, summer and fall.

Watershed and site information:

In 2019, Washington State Department of Agriculture (WSDA) monitored 16 sites in Washington. Stemilt was one of three monitoring sites located in Chelan County.

Years sampled: 2013 – present

Fish habitat: Spring Chinook salmon and summer steelhead (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:
9 weeks, April 2 – May 29

Water testing:

- Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Wash
- 90 current and legacy chemicals (35 insecticides, 35 herbicides, 9 fungicides, 7 pesticide degradates, 1 antimicrobial, 1 insect repellent, and 2 synergists)
- WSDA compares detected pesticide concentrations to WSDA assessment criteria, which are half of state and federal water quality criteria. Each pesticide has its own assessment criteria, based on its toxicity to aquatic animals, insects, and plants.

Results:

- There were 63 detections in Stemlit Creek.
  - Of these, 13 were above WSDA assessment criteria. Over 90% (12 detections) of exceeding detections were from DDT and its degradates.
- When multiple pesticides are detected simultaneously, the environmental effects can combine; multiple pesticides were detected every week Stemilt Creek was tested. Between three to 10 pesticides were detected at each sampling visit.
- WSDA identifies some pesticides as Pesticides of Concern (POC) when they have been detected above WSDA's assessment criteria and above certain detection frequencies.

Watershed-specific POCs detected in Stemlit Creek:

ICONS FOR ENVIRONMENTAL HAZARDS LISTED ON PESTICIDE LABELS

potential for spray drift | potential for runoff | potential to leach into groundwater | highly toxic to bees | toxic to aquatic invertebrates | toxic to fish | toxic to birds | toxic to mammals

Chlorpyrifos

- *Common trade names:* Lorsban, Pilot, Vesper
- *Example uses within watershed:* orchard
- A streamside no-spray buffer zone is required in Washington for chlorpyrifos to protect threatened and endangered Pacific salmon and steelhead.
- Detected at 10 sites in 2019. A watershed POC at six of them.

Diazinon

- *Common trade names:* Diazinon
- *Example uses within watershed:* orchard
- A streamside no-spray buffer zone is required in Washington for diazinon to protect threatened and endangered Pacific salmon and steelhead.
- Detected at nine sites in 2019. A watershed POC at two of them.

Malathion

- *Common trade names:* Malathion, Fyfanon
- *Example uses within watershed:* orchard
- A streamside no-spray buffer zone is required in Washington for malathion to protect threatened and endangered Pacific salmon and steelhead.
- Detected at 10 sites in 2019. A watershed POC at seven of them.

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The calendar at right shows the concentration in µg/L and date sampled of each watershed POC. The "–" identifies a sample that could not be analyzed. This calendar does not include all the pesticides WSDA found during the growing season. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems. None of the chlorpyrifos, diazinon, or malathion detections at this site exceeded WSDA assessment criteria in 2019, however, they are still considered watershed POCs because of their exceeding detections in recent years.

[** I: Insecticide*]

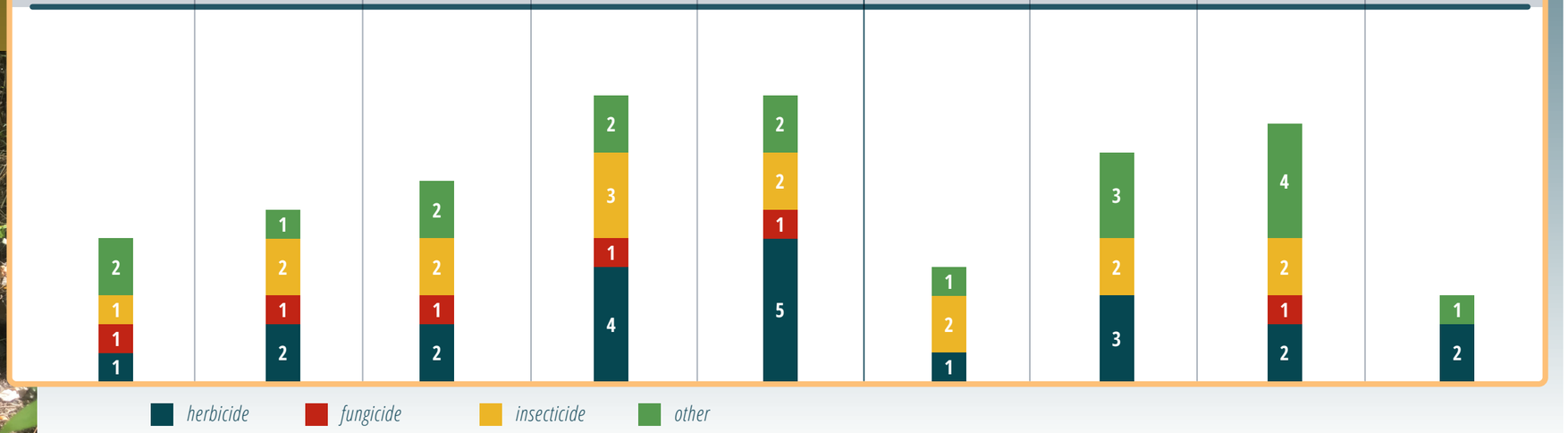
below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

Month ▶		Apr					May			
Day of the Month ▶	Use*	2	10	16	23	30	7	14	21	29
Chlorpyrifos	I	0.007	0.010	0.015	0.011	0.007	0.004	0.006	0.004	
Diazinon	I			0.005	0.012	0.016	0.004	0.004	0.003	
Malathion	I		0.012		0.004					
Total suspended solids *(mg/L)*		8	9	7	21	10	6	18	25	98
Streamflow *(cubic ft/sec)*		4.3	7.1	6.0	12.0	5.5	1.4	10.3	19.8	–
Precipitation *(total in/week)*		0	0.75	0.03	0	0.01	0	0	0.56	0.97

The graph at right shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes degradates and additional pesticide-related chemicals. Note that the number of detections between categories cannot be directly compared due to the different number of chemicals in each category and variability in analysis methods used.

Total Number of Detections per Sampling Event by Pesticide Category



Recommendations:

Please see agr.wa.gov/AgScience for more information.

Make use of natural protections

- Use buffers, filter strips, sediment basins, ground cover, and setbacks.
- Maintain vegetation along creeks and take care during spring time applications before vegetation along streams leafs out.

Be informed

- Read and follow pesticide label directions.
- Check the weather forecast to reduce the chances of drift or runoff.
- Review WSDA's Pesticides of Concern and choose less-toxic pesticides when possible.

Care for your equipment and products

- Calibrate, maintain, and inspect application equipment.
- Properly dispose of all unneeded pesticides. Visit agr.wa.gov/wastepesticide to learn about waste pesticide collection events.

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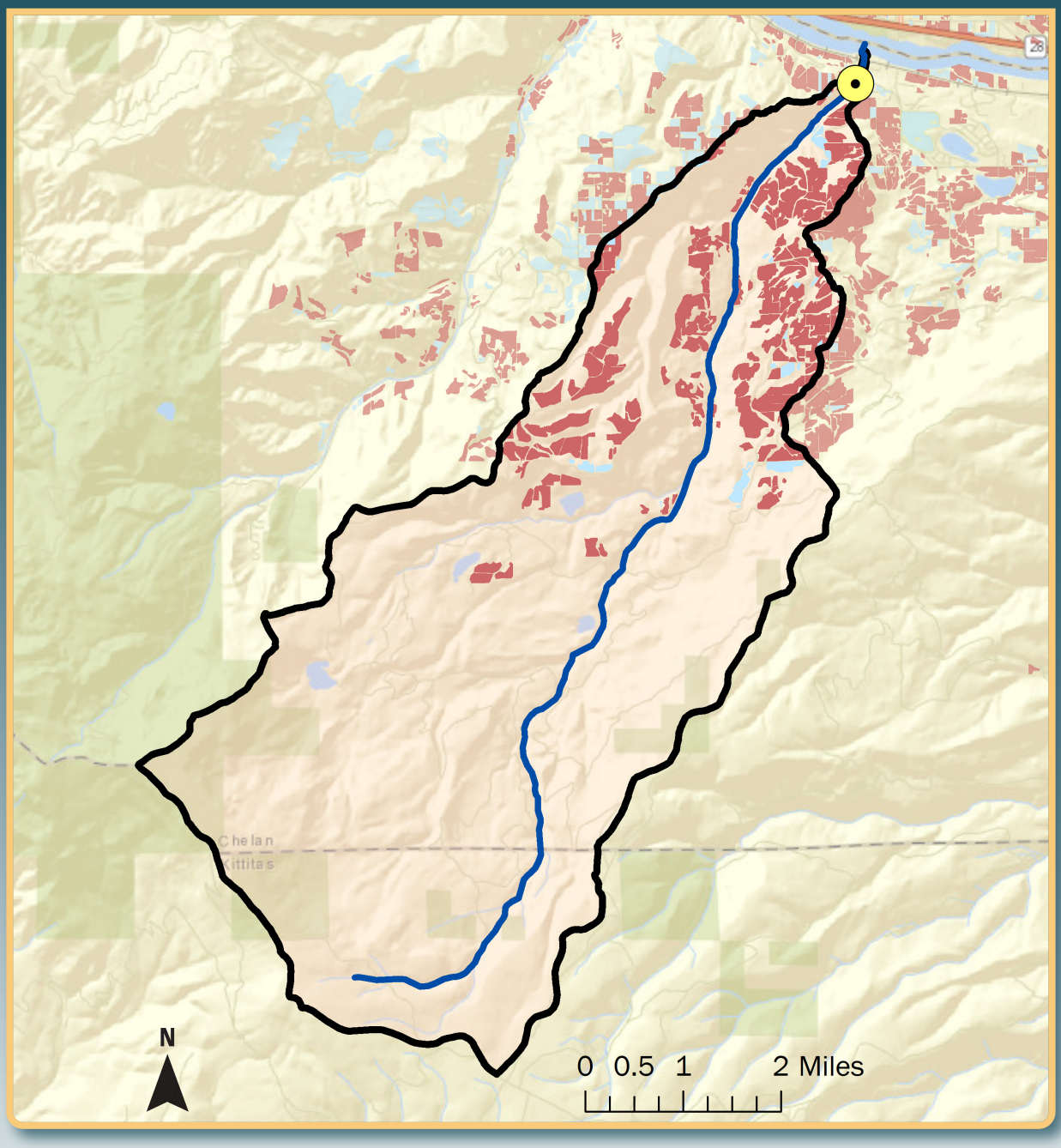

Stemlit Creek crop groupings | acres

Other	117	
Orchard	1,828	
Total Agriculture	1,945	acres
Watershed Total	**21,193**	acres

To view mapped crop groups at the field scale, download the WSDA Agricultural Land Use data or view the interactive web map here: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use