Upper Big Ditch

MARCH 2024

Summary of 2022 Surface Water Monitoring Program Results

In 2022, Washington State Department of Agriculture (WSDA) monitored 17 sites in Washington. Upper Big Ditch was one of three monitoring sites located in Skagit County.

Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Washington.

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.

Site information:

Years sampled: 2007 – present

Fish habitat: Fall Chinook, coho, fall chum, and pink salmon; cutthroat and winter steelhead trout (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:
24 weeks; April 5 – July 6, September 13 – November 16

Water testing:
Samples were tested for 150 current and legacy chemicals (53 herbicides, 48 insecticides, 21 fungicides, 19 pesticide degradates, 5 legacy chemicals, 1 antimicrobial, 1 insect repellent, 1 synergist, and 1 wood preservative).

Big Ditch drains directly into Puget Sound and is tidally influenced. Most of the Upper Big Ditch watershed is within the city of Mount Vernon. A culvert that impeded fish passage upstream of the Upper Big Ditch monitoring site was removed in the fall of 2020. Coho salmon were observed swimming through the reconstructed channel in late November 2020.

Results:

- There were 57 unique chemicals detected with a total of 461 detections in Upper Big Ditch. Of these, 5 detections were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Upper Big Ditch was sampled. Between 7 and 29 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 established detection frequencies.

Watershed-specific POCs in Upper Big Ditch:

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

Bifenthrin - *Insecticide*

- *Common trade name:* Sniper
- *Example uses within watershed:* market crops, grass
- Bifenthrin has extremely low solubility in water. Contamination is likely from bifenthrin bound to the soils in runoff.
- Also detected in six other monitored watersheds and a POC in all of them.

Chlorpyrifos - *Insecticide*

- *Common trade names:* Lorsban, Pilot, Vesper
- *Example uses within watershed:* nursery/ornamental, turf
- As of early 2022, chlorpyrifos has been banned for use on food and feed commodities. It can still be applied to registered non-food commodities.
- A streamside no-spray buffer zone is required in Washington for chlorpyrifos to protect threatened and endangered Pacific salmon and steelhead.
- This chemical was also a watershed POC in nine other monitored watersheds.

Imidacloprid - *Insecticide*

- *Common trade names:* Admire Pro, Gaucho, Merit
- *Example uses within watershed:* nursery/ornamental, residential
- Also detected in nine other monitored watersheds and a POC in all of them.

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The calendar at right shows the concentration in µg/L and date sampled of each watershed POC detected. This calendar does not include all the pesticides WSDA found during the growing season. The "–" identifies data that could not be collected or analyzed. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems. Chlorpyrifos and imidacloprid were not detected in 2022, however, they were still considered watershed POCs because of their exceeding detections in recent years at this site.

[** I: Insecticide*]

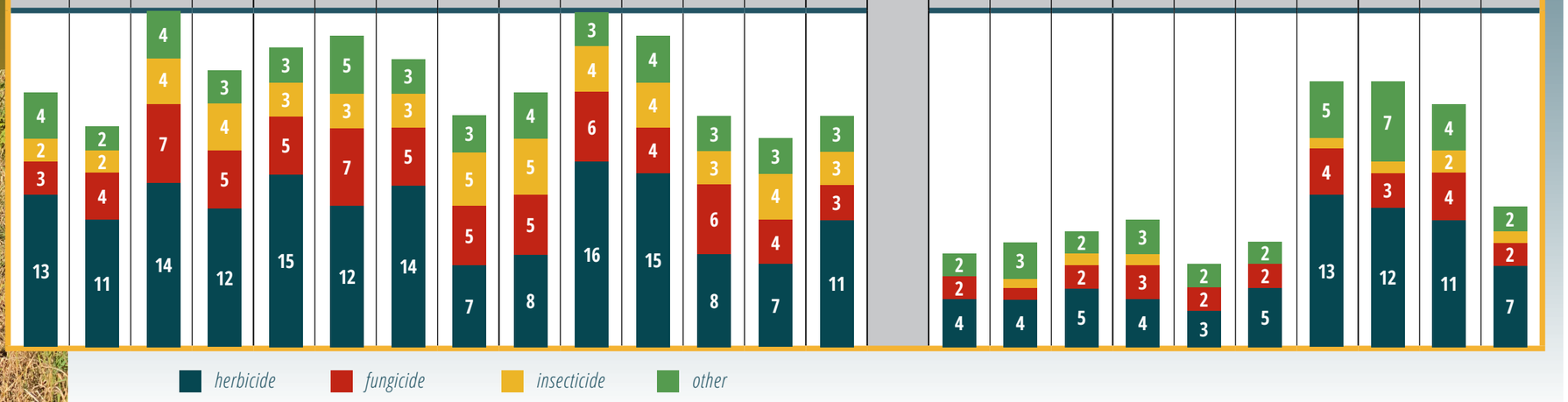
exceeds assessment criteria

Watershed Pesticide of Concern Detected and its Corresponding Sampling Dates and Concentrations

Month ▸		Apr				May				June					Jul		Sep			Oct				Nov		
Day of the Month ▸	Use*	5	12	19	26	3	10	17	24	1	7	14	22	28	6		13	20	27	4	11	18	25	1	8	16
Bifenthrin	I											0.005														
Suspended sediment conc. *(mg/L)*		12	8	6	9	7	7	8	7	8	11	20	6	6	3		8	3	4	4	3	11	5	11	5	3
Streamflow *(cubic ft/sec)*		7.6	4.8	3.8	2.3	2.7	3.1	-	2.0	1.2	3.9	8.3	1.8	1.3	1.7		0.5	0.3	0.4	0.5	0.1	0.1	1.0	4.3	-	1.7
Precipitation *(total in/week)*		0.61	0.51	0.27	0.19	0.64	0.91	0.65	0.06	0.37	1.54	1.52	0.00	0.00	0.31		0.00	0.02	0.00	0.00	0.00	0.00	0.75	2.64	3.77	0.01

The graph at right shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes legacy, 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



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

Recommendations:

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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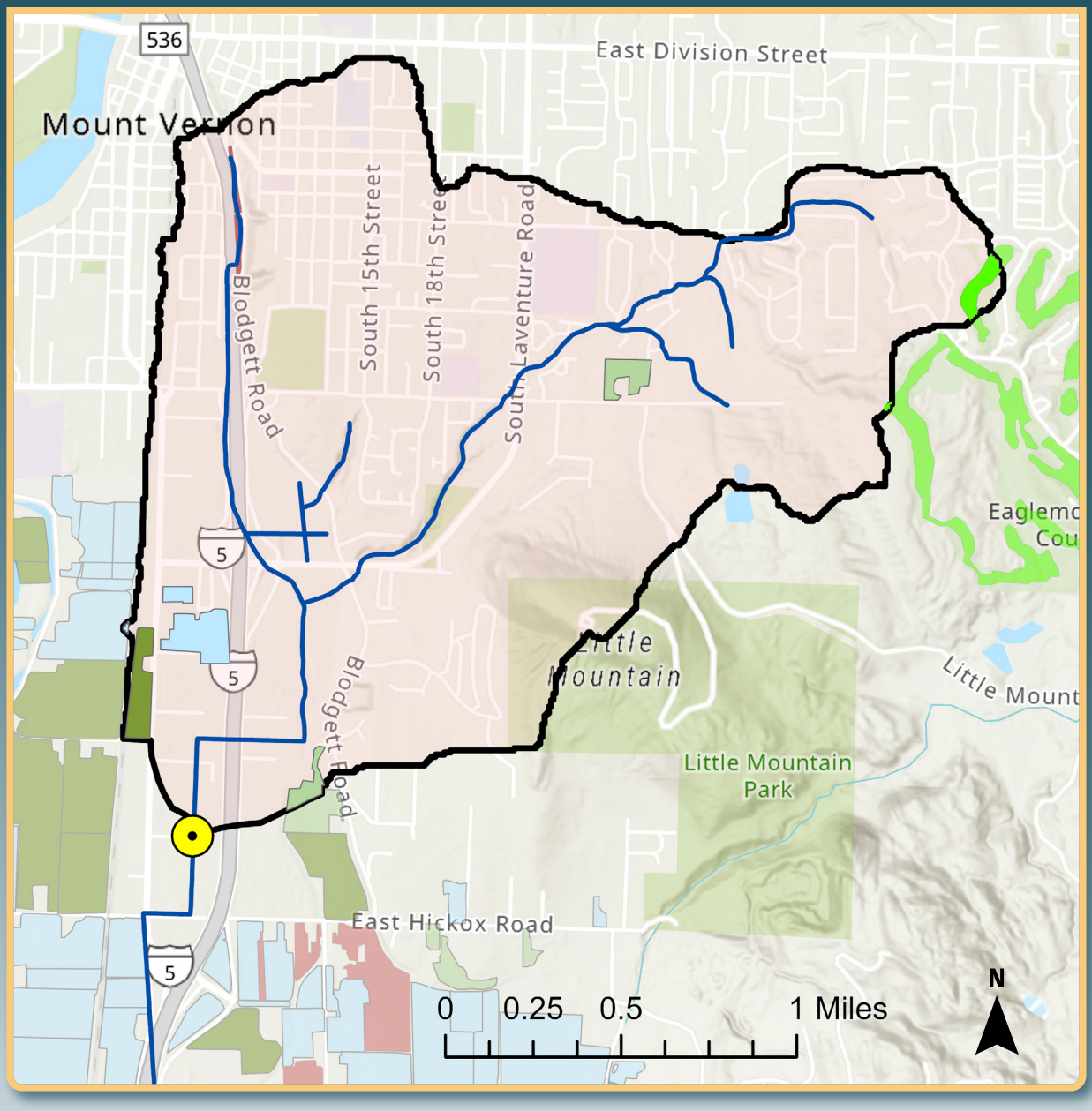

Upper Big Ditch crop groupings | acres	
Nursery	4
Pasture	11
Turfgrass	6
Seed	11
Other	16

- Sampling Location
- Big Ditch
- Upper Big Ditch Watershed

Total Agriculture	48	acres
Total Non-Agriculture	1,992	acres
Watershed Total	**2,040**	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