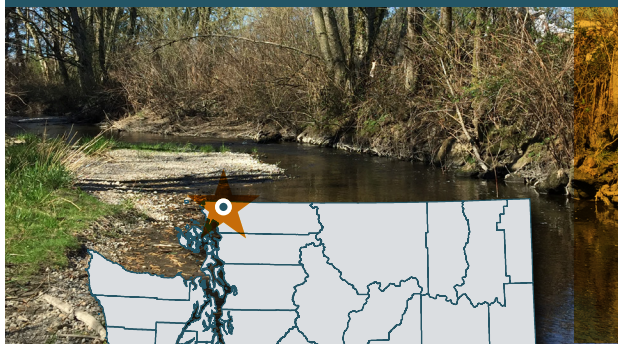


# Upper Bertrand Creek

MARCH 2024

## Summary of 2022 Surface Water Monitoring Program Results



In 2022, Washington State Department of Agriculture (WSDA) monitored 17 sites in Washington. Upper Bertrand was one of two monitoring sites located in Whatcom 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:** 2013 – present

**Fish habitat:** Coho, fall chum, pink and sockeye salmon; bull, cutthroat, and winter steelhead trout  
(SalmonScape: [apps.wdfw.wa.gov/salmonscape](https://apps.wdfw.wa.gov/salmonscape))

### Sampling dates:

23 weeks; April 5 – July 19, October 3 – November 15

### 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).

Products listed are for descriptive purposes only and do not imply endorsement by the author or the Department of Agriculture.



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WSDA monitored Bertrand Creek at two locations: Upper Bertrand located near the Canadian border and Lower Bertrand located 6.75 miles downstream. Using both sampling locations provides an opportunity to compare potential pesticide inputs from Canada to pesticide detections downstream in the United States. Roughly 14,000 acres of this watershed are in Canada where the main crops and management practices are outside the scope of WSDA's crop mapping program.

### Results:

- There were 54 unique chemicals detected with a total of 452 detections in Upper Bertrand Creek. Of these, 18 detections were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Upper Bertrand was sampled. Between 4 and 28 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 Bertrand Creek:

#### ICONS FOR ENVIRONMENTAL HAZARDS LISTED ON PESTICIDE LABELS



#### Bifenthrin - Insecticide



- Common trade name:** Sniper
- Example uses within watershed:** berry, corn, grass hay, pasture, potato, wheat
- 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:** golf course, silviculture, 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.
- Also detected in five other monitored watersheds and a POC in four of them.

#### Diuron - Herbicide



- Common trade names:** Direx, Karmex
- Example uses within watershed:** berry, grass hay, field corn, pasture
- This chemical can transport into the environment via drift or runoff and can contaminate groundwater. Diuron has been found in groundwater in Washington State.
- Also detected in 11 other monitored watersheds and a POC in six of them.

#### Imidacloprid - Insecticide



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

The calendar at right shows the concentration in µg/L and date sampled of each watershed POC detected. The “-” identifies data that could not be collected. 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.

[ \* H: Herbicide; I: Insecticide ]  
 exceeds assessment criteria    
 below assessment criteria  

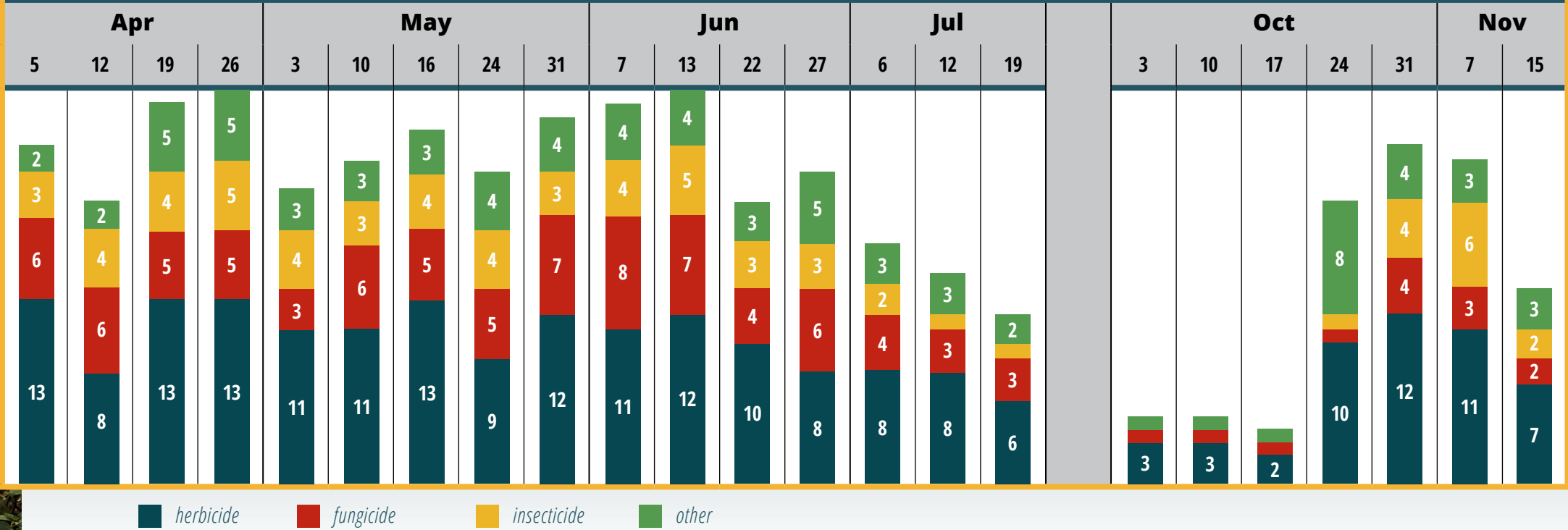
Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

Month		Apr				May					Jun				Jul			Oct					Nov	
Day of the Month	Use*	5	12	19	26	3	10	16	24	31	7	13	22	27	6	12	19	3	10	17	24	31	7	15
Bifenthrin	I																						0.005	
Chlorpyrifos	I	0.003	0.002																				0.003	
Diuron	H																			0.539				
Imidicloprid	I	0.031	0.028	0.045	0.034	0.049	0.033	0.025	0.02	0.016	0.019	0.023											0.048	0.013
Suspended sediment concentration (mg/L)		7	2	6	6	3	3	15	4	3	5	3	1	2	1	2	2	2	7	2	3	18	4	2
Streamflow (cubic ft/sec)		65.1	27.4	43.3	36.6	21.2	25.6	-	14.5	19.4	33.9	25.4	10.2	5.4	4.4	3.3	2.7	-	1.3	1.0	1.6	-	-	9.4
Precipitation (total in/week)		0.85	0.78	0.60	0.58	0.43	1.26	1.20	0.19	1.14	1.61	1.24	0.34	0.17	0.14	0.13	0.05	0.03	0.04	0.02	0.48	4.14	3.56	0.01

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:

#### 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 leaves 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.

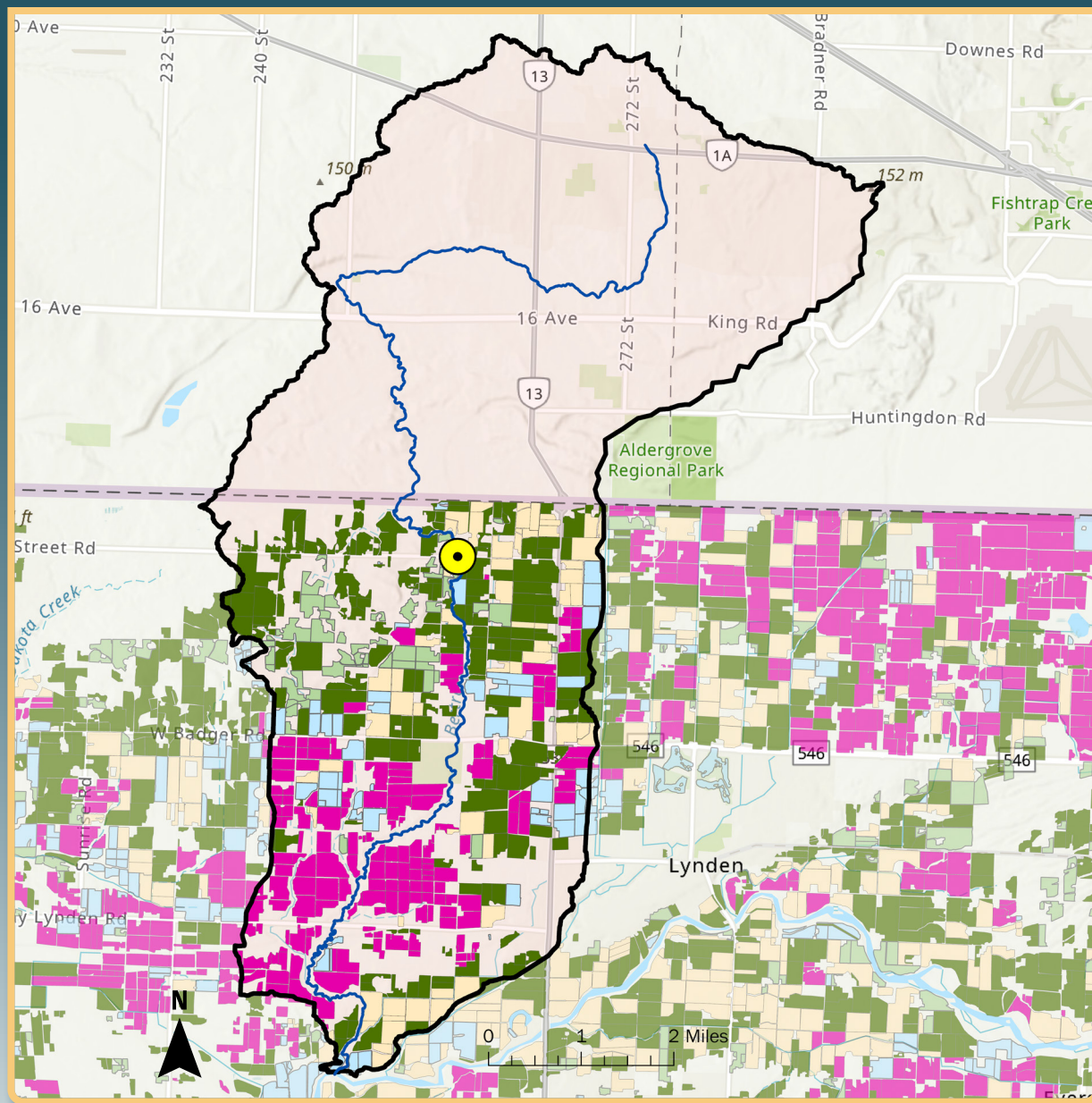
#### Care for your equipment and products

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

Please see [agr.wa.gov/AgScience](http://agr.wa.gov/AgScience) for more information.







#### Upper Bertrand crop groupings | acres

<span style="display:inline-block; width:15px; height:15px; background-color:magenta; border:1px solid black;"></span> <b>Berry</b>	2,278
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> <b>Cereal Grain</b>	1,232
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen; border:1px solid black;"></span> <b>Hay / Silage</b>	3,038
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> <b>Pasture</b>	559
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> <b>Other</b>	823

- Sampling Location
- Bertrand Creek
- Bertrand Watershed

Total U.S. Agriculture 7,930 acres

Total U.S. Non-Agriculture 4,936 acres

**Watershed Total 26,893 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>