Lower Bertrand Creek

FEBRUARY 2023

Summary of 2021 Surface Water Monitoring Program Results

In 2021, Washington State Department of Agriculture (WSDA) monitored 18 sites in Washington. Lower 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: Fall Chinook, coho, fall chum, pink, and sockeye salmon; bull and winter steelhead trout (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:
23 weeks; April 6–August 23, October 18, and November 1

Water testing:
Samples were tested for 170 current and legacy chemicals (59 insecticides, 58 herbicides, 23 fungicides, 19 pesticide degradates, 6 legacy chemicals, 2 synergists, 1 antimicrobial, 1 insect repellent, and 1 wood preservative).

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

Washington State Department of Agriculture

NATURAL RESOURCES ASSESSMENT SECTION

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 63 unique chemicals detected with a total of 569 detections in Lower Bertrand Creek. Of these, 26 detections were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Lower Bertrand was sampled. Between 17 and 31 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 Lower Bertrand 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

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.
- This chemical was also a watershed POC in three other monitored watersheds.

Diazinon - Insecticide

- *Common trade name:* Diazinon
- *Example uses within watershed:* berry, nursery
- A streamside no-spray buffer zone is required in Washington for diazinon to protect threatened and endangered Pacific salmon and steelhead.
- Also detected in 15 other monitored watersheds and a POC in one 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 nine 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 13 other monitored watersheds and a POC in 10 of them.

Malathion - Insecticide

- *Common trade names:* Malathion, Fyfanon
- *Example uses within watershed:* berry, corn, grass hay, pasture, potato, wheat
- Also detected in seven other monitored watersheds and a POC in three of them.

Permethrin - Insecticide

- *Common trade names:* Fastac CS, Permanone
- *Example uses within watershed:* building perimeter, corn, livestock, potato
- Also a watershed POC in one other monitored watershed.

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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.

[* H: Herbicide, I: Insecticide]

exceeds assessment criteria

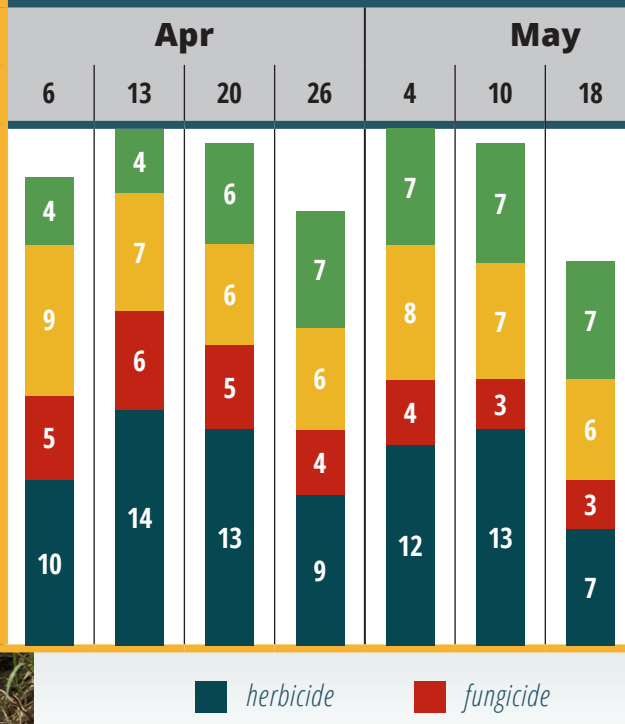
below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Samp

Month ▶		Apr				May		
Day of the Month ▶	Use*	6	13	20	26	4	10	
Diazinon	I			0.017	0.012	0.005	0.003	
Diuron	H	0.004		0.004	0.006			
Imidacloprid	I	0.022	0.018	0.013	0.035	0.028	0.021	
Malathion	I	0.016	0.019	0.016	0.031	0.012	0.012	
Permethrin	I	0.005						
Suspended sediment concentration *(mg/L)*		-	-	3	2	3	3	
Streamflow *(cubic ft/sec)*		46.8	43.8	28.8	33.9	25.8	23.3	
Precipitation *(total in/week)*		0.07	0.51	0	0.40	0.33	0.59	

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 E



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.

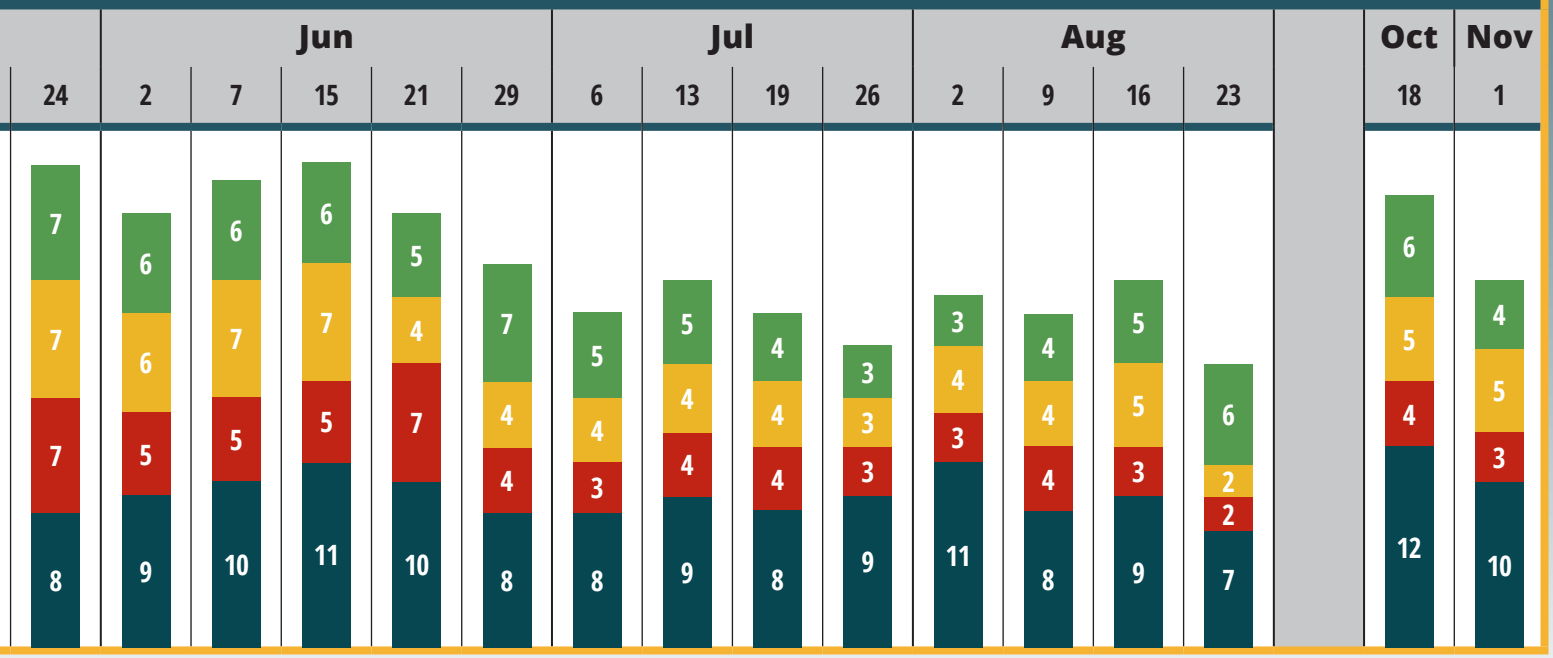
Be informed

- 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.

ling Dates and Concentrations

y		Jun					Jul				Aug				Oct	Nov
18	24	2	7	15	21	29	6	13	19	26	2	9	16	23	18	1
.081	0.048	0.007	0.004	0.005	0.004											
.025				0.014	0.017	0.015	0.019	0.009	0.010		0.004		0.006	0.004		
.030	0.010	0.013	0.014	0.015	0.011	0.010	0.007	0.006	0.006		0.004	0.004	0.004		0.043	0.026
.010	0.005	0.007	0.005	0.048			0.012	0.009	0.042	0.038	0.009	0.026			0.015	0.019
2	2	1	1	2	1	1	2	2	2	2	1	1		1	7	3
20.2	18.1	38.2	16.6	29.4	14.3	17.9	4.0	5.7	4.5	3.1	3.5	5.7	5.1	6.9	157.0	68.9
0.19	0.36	0.45	0.51	0.89	0.34	0	0	0	0	-	-	-	-	-	2.39	1.91

vent by Pesticide Category



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

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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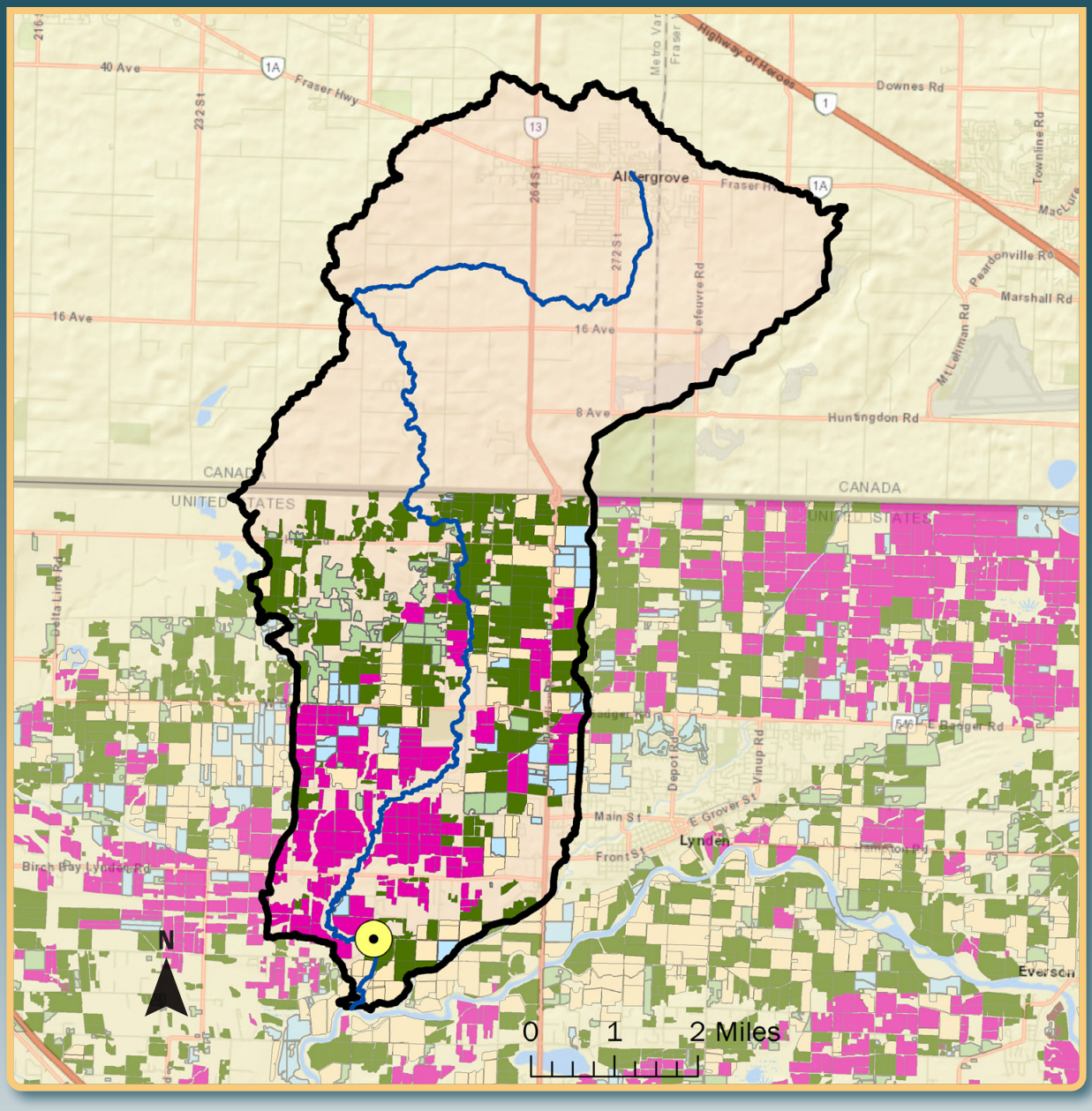

Lower Bertrand crop groupings	acres
Berry	2,334
Cereal Grain	1,264
Hay / Silage	3,162
Other	157
Pasture	702
Vegetable	478

- Sampling Location
- Bertrand Creek
- Bertrand Watershed

Total U.S. Agriculture	8,097	acres
Total U.S. Non-Agriculture	4,733	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