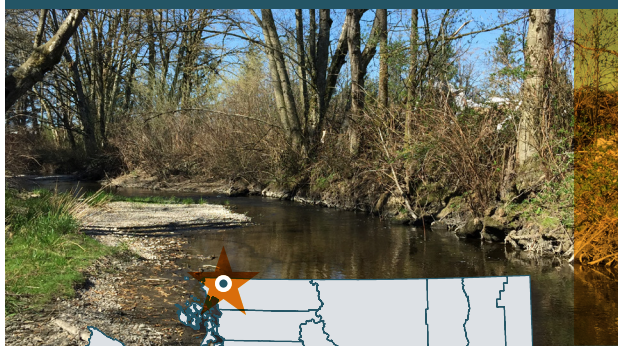


Upper Bertrand Creek

APRIL 2021

Summary of 2019 Surface Water Monitoring Program Results



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.

Watershed and site information:

In 2019, Washington State Department of Agriculture (WSDA) monitored 16 sites in Washington. Upper Bertrand was one of two monitoring sites located in Whatcom County.

Years sampled: 2013 – present

Fish habitat:

Chinook, coho, chum, and sockeye salmon; and steelhead (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:

25 weeks, March 26 – September 4

Water testing:

- Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Wash.
- 159 current and legacy chemicals (56 insecticides, 58 herbicides, 21 fungicides, 19 pesticide degradates, 2 synergists, 1 antimicrobial, 1 insect repellent, and 1 wood preservative)
- 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 486 detections in Upper Bertrand Creek. Of these, 26 were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the environmental effects can combine; multiple pesticides were detected every week Upper Bertrand was tested. Between 10 to 34 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 Upper Bertrand Creek:

ICONS FOR ENVIRONMENTAL HAZARDS LISTED ON PESTICIDE LABELS



Diazinon



- *Common trade names:* 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.
- Detected at nine sites in 2019. A watershed POC at two of them.

Imidacloprid



- *Common trade names:* Admire Pro, Gaucho, Merit
- *Example uses within watershed:* berry, corn, potato, wheat, residential
- Detected at 11 sites in 2019. A watershed POC at nine of them.

Malathion



- *Common trade names:* Malathion, Fyfanon
- *Example uses within watershed:* berry, corn, grass hay, pasture, potato, wheat
- Malaoxon, a malathion breakdown product, is more toxic to organisms than its parent compound. Malaoxon was detected 16 times at this site.
- 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.



NATURAL RESOURCES ASSESSMENT SECTION

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

The calendar at right shows the concentration in µg/L and date sampled of each watershed POC. 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.

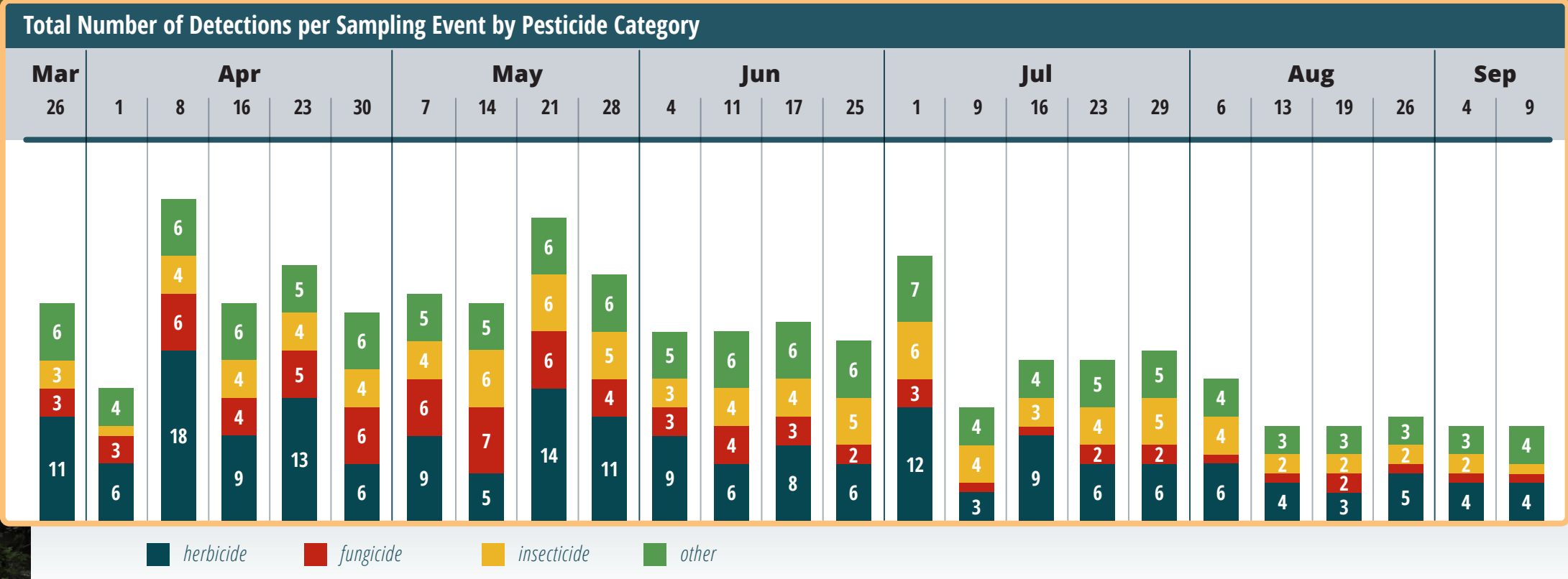
[* I: Insecticide]

exceeds assessment criteria

below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations																											
Month ▶		Use*	Mar	Apr					May				Jun				Jul					Aug				Sep	
Day of the Month ▶	26		1	8	16	23	30	7	14	21	28	4	11	17	25	1	9	16	23	29	6	13	19	26	4	9	
Diazinon	I	0.004			0.009	0.006			0.011	0.009	0.005																
Imidacloprid	I	0.027	0.027	0.023	0.034	0.082	0.034	0.068	0.115	0.140	0.178	0.060	0.249	0.090	0.045	0.117	0.125	0.055	0.061	0.067	0.035	0.015	0.014	0.014	0.005	0.005	
Malathion	I														0.004	0.004	0.004	0.012	0.013		0.005						
Total suspended solids (mg/L)		3	5	4	4	5	2	3	2	3	4	1	7	3	2	2	2	2	2	1	3	2	1	1			
Streamflow (cubic ft/sec)		18.8	10.8	44.2	42.1	61.6	16.1	10.0	6.8	16.4	8.5	4.4	4.1	2.9	2.0	2.5	2.5	2.0	1.6	2.5	1.3	1.2	0.9	1.1	0.9	1.6	
Precipitation (total in/week)		0.15	0.49	0.85	1.40	1.28	0.05	0	0	0.75	0.53	0.21	0.25	0.06	0.13	0.66	0.57	0.20	0.15	0.21	1.45	0.06	0.94	0.39	1.10	1.53	

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.



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.

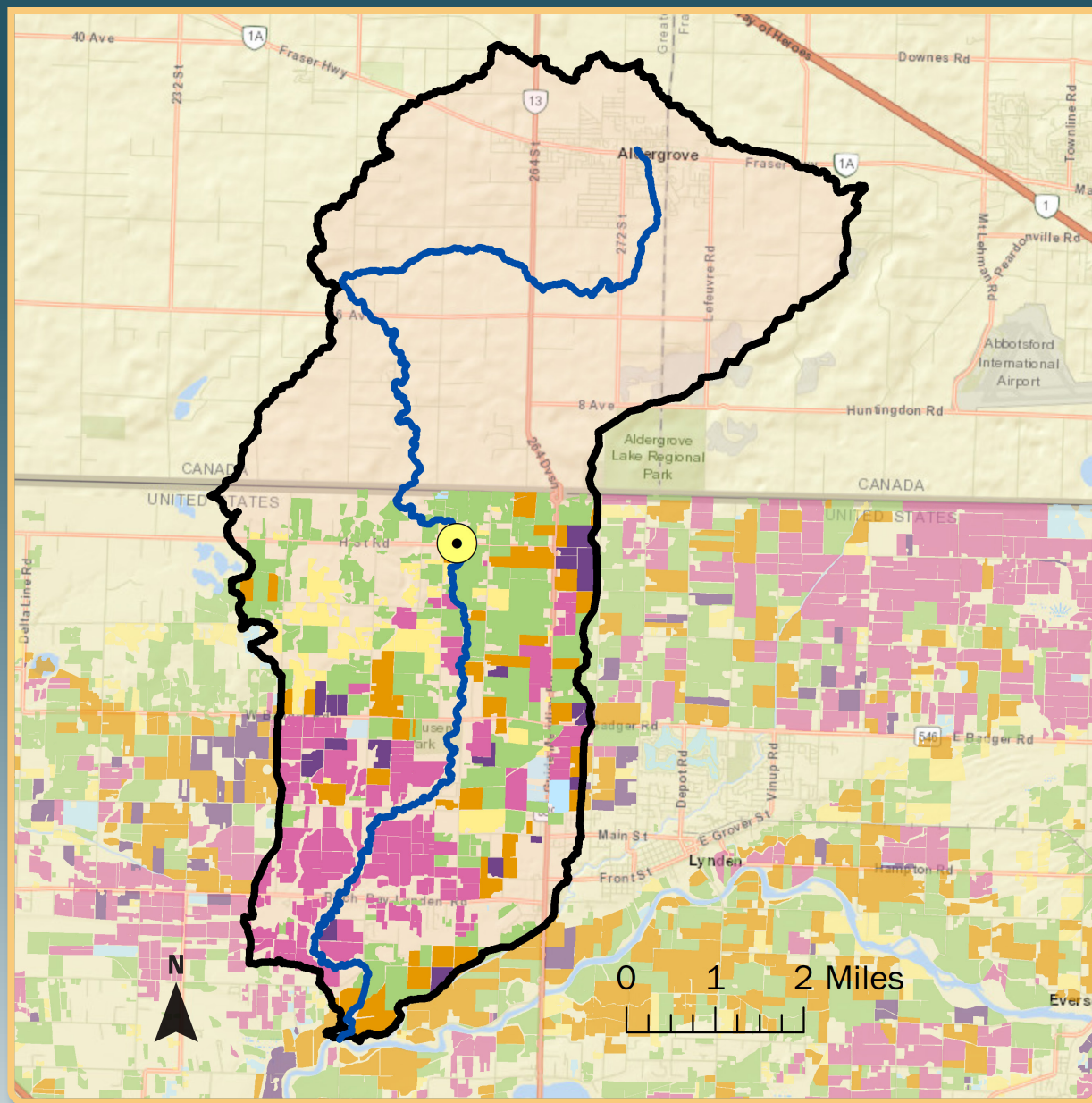
Be informed

- 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 to learn about waste pesticide collection events.

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



Upper Bertrand crop groupings | acres

 Berry	2,337
 Cereal Grain	1,264
 Hay / Silage	3,162
 Other	156
 Pasture	702
 Vegetable	478



Sampling Location



Bertrand Creek



Bertrand Watershed

Total U.S. Agriculture 8,099 acres

Total U.S. Non-Agriculture 4,731 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>