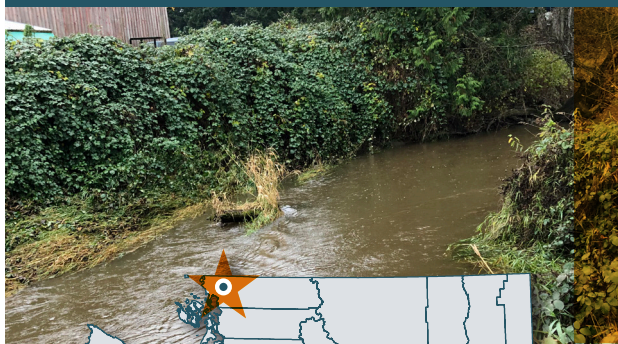# Lower Bertrand Creek

### 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. Lower 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.

**NATURAL RESOURCES ASSESSMENT SECTION**

## Results:

- There were 697 detections in Lower Bertrand Creek. Of these, 27 were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the environmental effects can combine; multiple pesticides were detected every week Lower Bertrand was tested. Between 15 to 39 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 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
- *Common trade names:* Sniper
- *Example uses within watershed:* berry, corn, grass hay, pasture, potato, wheat
- Detected at three 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.

### Thiamethoxam
- *Common trade names:* Actara, Cruiser, Platinum
- *Example uses within watershed:* berry, corn, potato
- Thiamethoxam has been found in groundwater and surface water samples in Washington.
- Detected at 13 sites in 2019. A watershed POC at two of them.

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

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
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 ▮
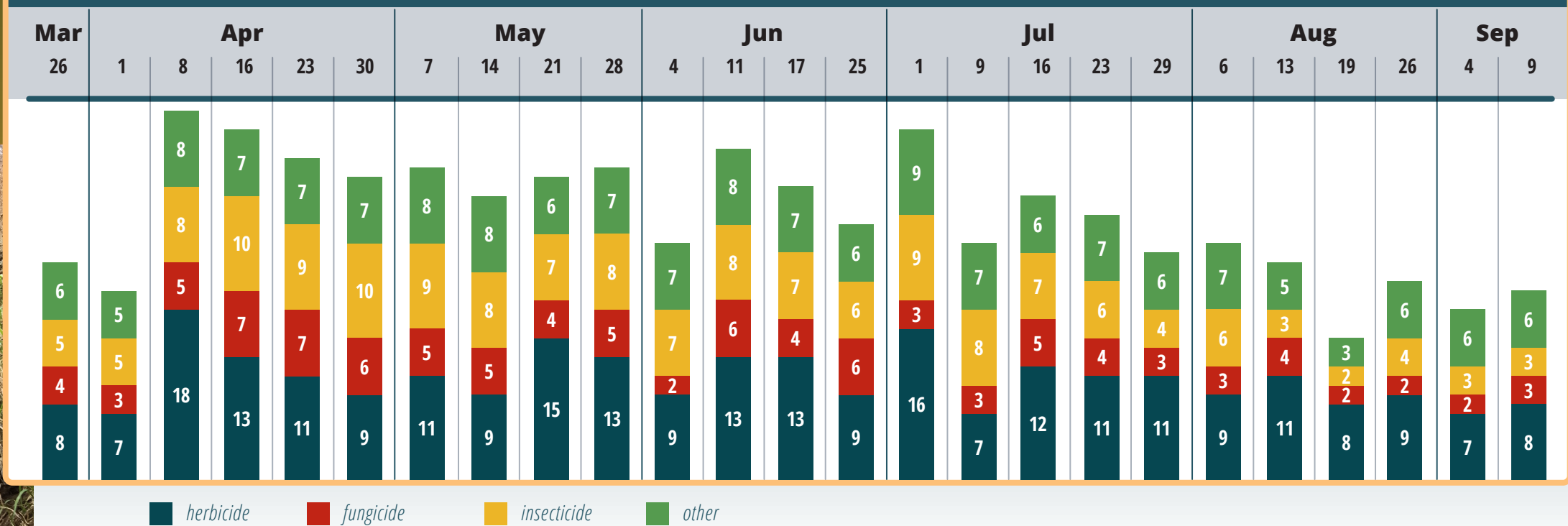
below assessment criteria ▮

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.

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

| Month / Day of the Month | Use* | Mar 26 | Apr 1 | Apr 8 | Apr 16 | Apr 23 | Apr 30 | May 7 | May 14 | May 21 | May 28 | Jun 4 | Jun 11 | Jun 17 | Jun 25 | Jul 1 | Jul 9 | Jul 16 | Jul 23 | Jul 29 | Aug 6 | Aug 13 | Aug 19 | Aug 26 | Sep 4 | Sep 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bifenthrin | I | | | | | | | | | | | | | | | | | | | | | | | | | |
| Imidacloprid | I | 0.025 | 0.016 | 0.020 | 0.035 | 0.036 | 0.022 | 0.026 | 0.031 | 0.064 | 0.049 | | 0.085 | 0.033 | 0.017 | 0.043 | 0.290 | 0.055 | 0.029 | | 0.010 | | | 0.007 | | |
| Malathion | I | 0.020 | 0.004 | 0.047 | 0.010 | 0.006 | 0.009 | 0.007 | 0.010 | | 0.010 | 0.004 | | | 0.003 | 0.036 | 0.021 | 0.038 | 0.027 | 0.028 | 0.008 | 0.006 | | | | |
| Thiamethoxam | I | 0.021 | 0.024 | 0.017 | 0.019 | 0.025 | 0.032 | 0.043 | 0.052 | 0.072 | 0.043 | 0.036 | 0.049 | 0.046 | 0.054 | 0.058 | 0.049 | 0.045 | 0.040 | 0.036 | 0.029 | 0.020 | 0.026 | 0.027 | 0.031 | 0.028 |
| Total suspended solids (mg/L) | | 2 | 3 | 6 | 5 | 7 | 3 | 2 | 2 | 2 | 2 | | | | | | | 1 | | | | | | | | |
| Streamflow (cubic ft/sec) | | 40.4 | 29.5 | 75.9 | 78.7 | 110.0 | 37.6 | 24.3 | 18.3 | 22.6 | 21.9 | 16.6 | 15.2 | 11.7 | 9.5 | 10.5 | 9.3 | 7.2 | 5.9 | 8.1 | 4.3 | 4.3 | 5.1 | 6.4 | 5.3 | 6.3 |
| 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 |

## Total Number of Detections per Sampling Event by Pesticide Category

| Date | Herbicide | Fungicide | Insecticide | Other |
|---|---|---|---|---|
| Mar 26 | 8 | 4 | 5 | 6 |
| Apr 1 | 7 | 3 | 5 | 5 |
| Apr 8 | 18 | 5 | 10 | 8 |
| Apr 16 | 13 | 7 | 9 | 7 |
| Apr 23 | 11 | 7 | 10 | 7 |
| Apr 30 | 9 | 6 | 10 | 7 |
| May 7 | 11 | 5 | 9 | 8 |
| May 14 | 9 | 5 | 8 | 7 |
| May 21 | 15 | 4 | 7 | 6 |
| May 28 | 13 | 5 | 8 | 7 |
| Jun 4 | 9 | 2 | 7 | 7 |
| Jun 11 | 13 | 6 | 8 | 8 |
| Jun 17 | 13 | 4 | 7 | 7 |
| Jun 25 | 9 | 6 | 6 | 6 |
| Jul 1 | 16 | 3 | 9 | 9 |
| Jul 9 | 7 | 3 | 8 | 7 |
| Jul 16 | 12 | 5 | 7 | 6 |
| Jul 23 | 11 | 4 | 6 | 7 |
| Jul 29 | 11 | 3 | 4 | 6 |
| Aug 6 | 9 | 3 | 6 | 7 |
| Aug 13 | 11 | 4 | 3 | 5 |
| Aug 19 | 8 | 2 | 2 | 3 |
| Aug 26 | 9 | 2 | 4 | 6 |
| Sep 4 | 7 | 2 | 3 | 6 |
| Sep 9 | 8 | 3 | 3 | 6 |

Legend: ▮ herbicide  ▮ fungicide  ▮ insecticide  ▮ other

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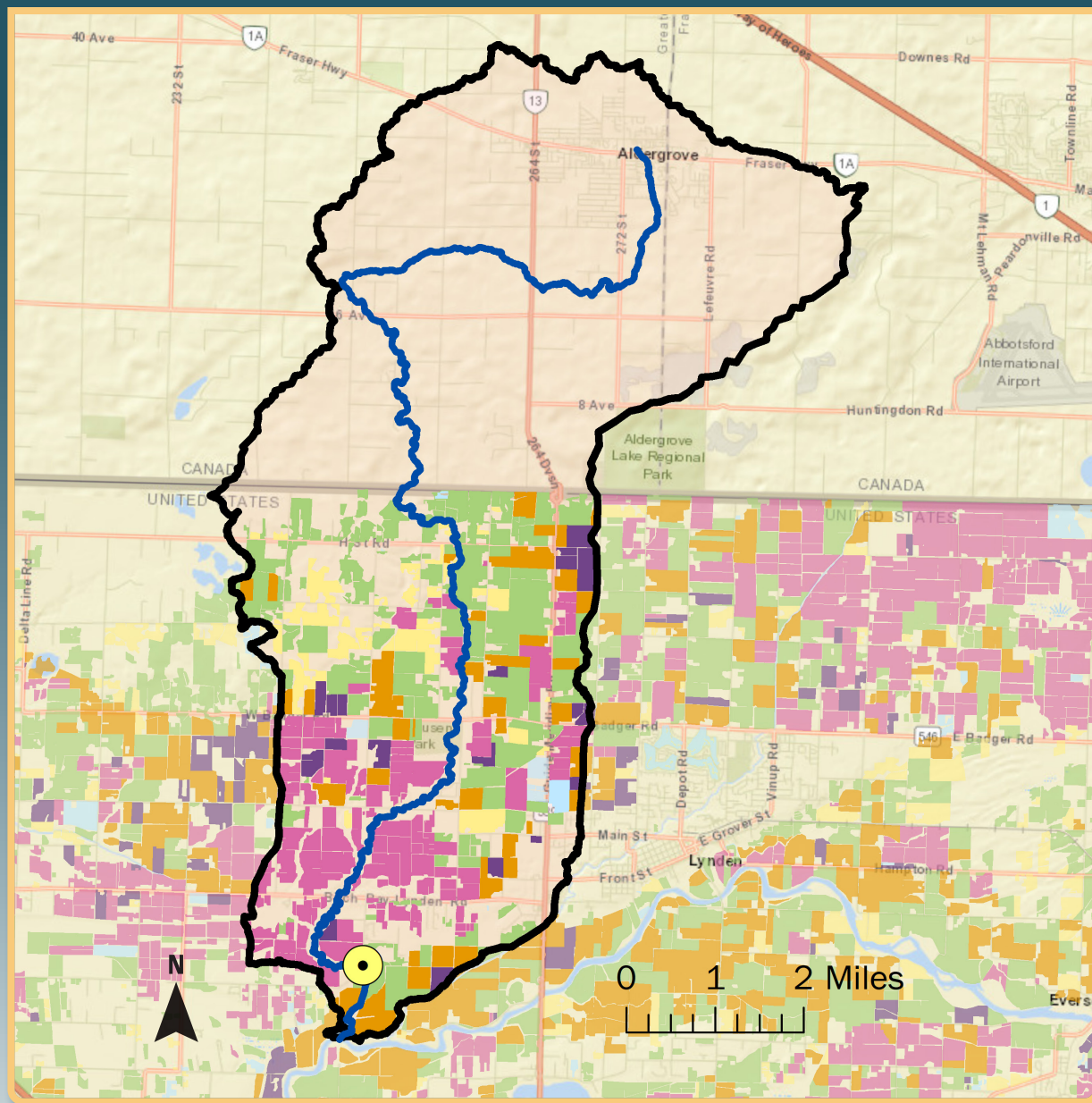
**Be informed**
- Read and follow pesticide label directions.
- Check the weather forecast to reduce the chances of drift or runoff.
- Review WSDA's Pesticides of Concern and choose less-toxic pesticides when possible.

**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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NATURAL RESOURCES ASSESSMENT SECTION

| Lower Bertrand crop groupings | acres |
|---|---|
| Berry | 2,337 |
| Cereal Grain | 1,264 |
| Hay / Silage | 3,162 |
| Other | 156 |
| Pasture | 702 |
| Vegetable | 478 |

**Legend**

- 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