Upper Bertrand Creek
Summary of 2020 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.

Results:
- There were 49 unique chemicals detected with a total of 483 detections in Upper Bertrand Creek. Of these, 24 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 11 and 32 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:

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 six sites in 2020. 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 13 sites in 2020. A watershed POC at 11 of them.

Malathion
- Common trade names: Malathion, Fyfanon
- Example uses within watershed: berry, corn, grass hay, pasture, potato, wheat
- 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 2020. A watershed POC at eight of them.

Site information:
In 2020, 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 winter steelhead trout (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates: 24 weeks, March 17 and June 15 – November 16
- Although staff typically collect samples during the spring and summer seasons when higher pesticide usage is expected, the sampling schedule was shifted three months later due to COVID-19 restrictions.

Water testing:
- Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Wash.
- Samples were tested for 166 current and legacy chemicals (61 insecticides, 58 herbicides, 23 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.
The calendar at right shows concentrations 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. The malathion detection did not exceed WSDA assessment criteria in 2020, however, it is still considered a watershed POC because of its exceeding detections in recent years at this site.

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 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.

The graph at right shows the total number of detections per sampling event by 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.

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

<table>
<thead>
<tr>
<th>Upper Bertrand crop groupings</th>
<th>acres</th>
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</thead>
<tbody>
<tr>
<td>Berry</td>
<td>2,337</td>
</tr>
<tr>
<td>Cereal Grain</td>
<td>1,264</td>
</tr>
<tr>
<td>Hay / Silage</td>
<td>3,162</td>
</tr>
<tr>
<td>Other</td>
<td>156</td>
</tr>
<tr>
<td>Pasture</td>
<td>702</td>
</tr>
<tr>
<td>Vegetable</td>
<td>478</td>
</tr>
<tr>
<td><strong>Total U.S. Agriculture</strong></td>
<td>8,099</td>
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<tr>
<td><strong>Total U.S. Non-Agriculture</strong></td>
<td>4,731</td>
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<tr>
<td><strong>Watershed Total</strong></td>
<td>26,893</td>
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</tbody>
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