The irrigation projects in the region have allowed modification of the sagebrush steppe environment to become agriculturally productive. Data suggests the fall Chinook salmon in the creek are genetically diverse and distinct from hatchery salmon in the area (Small et al., 2011). This was the last year staff sampled Lower Crab Creek due to few pesticide detections exceeding WSDA assessment criteria several years in a row.

### Site information:

In 2020, Washington State Department of Agriculture (WSDA) monitored 16 sites in Washington. Lower Crab was the only monitoring site located in Grant County.

**Years sampled:** 2017 – 2020

**Fish habitat:** Summer steelhead and fall Chinook salmon (SalmonSpeak: apps.wdfw.wa.gov/salmonscape)

**Sampling dates:** 13 weeks, March 17 and June 16 – September 1

- 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.

### Results:

- There were 43 unique chemicals detected with a total of 252 detections in Lower Crab Creek. No detections were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Lower Crab Creek was sampled. Between 13 and 28 pesticides were detected at each sampling event.
- WSDA identifies some pesticides as Pesticides of Concern (POC) when they have been detected above WSDA’s assessment criteria and above established detection frequencies.

### Statewide POCs in Lower Crab Creek:

#### Chlorpyrifos

- **Common trade names:** Lorsban, Pilot, Vesper
- **Example uses within watershed:** alfalfa, apples, corn, wheat
- Chlorpyrifos is banned in California, New York, Hawaii, Maryland and the European Union.
- A streamside no-spray buffer zone is required in Washington for chlorpyrifos to protect threatened and endangered Pacific salmon and steelhead.
- Detected at 14 sites in 2020. A watershed POC at six of them.

#### Malathion

- **Common trade names:** Malathion, Fyfanon
- **Example uses within watershed:** alfalfa, apples, corn, grass hay, 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.

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**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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**Statewide Pesticides of Concern Detected and Their Corresponding Sampling Dates and Concentrations**

<table>
<thead>
<tr>
<th>Month</th>
<th>Mar</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
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</thead>
<tbody>
<tr>
<td>Day of the Month</td>
<td>17</td>
<td>16</td>
<td>23</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>I</td>
<td>0.007</td>
<td>0.004</td>
<td>0.003</td>
<td>0.003</td>
</tr>
<tr>
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<td>0.003</td>
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**Total suspended solids (mg/L)**

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

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The calendar at right shows the concentration in µg/L and date sampled of each statewide POC detected. 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. None of the chlorpyrifos or malathion detections at this site exceeded WSDA assessment criteria in 2020, however, they are still considered statewide POCs because of their exceeding detections in many other watersheds.

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.
Lower Crab Creek crop groupings | acres

- Other: 11,655 acres
- Cereal / Grain: 31,457 acres
- Hay / Silage: 26,535 acres
- Orchard: 19,674 acres
- Pasture: 7,967 acres
- Vegetable: 12,786 acres

Total Agriculture: 110,074 acres
Watershed Total: 256,675 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