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). Also, a wildfire surrounded the monitoring site in early June preventing sampling June 4. The sampling schedule was pushed forward one week, starting June 11.

Results:

- There were 328 detections in Lower Crab Creek. Of these, four were above WSDA assessment criteria.
  - Pesticides that exceeded were two DDT degradates, tefluthrin, and fluvalinate.
- When multiple pesticides are detected simultaneously, the environmental effects can combine; multiple pesticides were detected almost every week Lower Crab Creek was tested. Between nine to 34 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 certain detection frequencies.

Statewide POCs detected 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.
- Chlorpyrifos was detected once in Touchet River below WSDA assessment criteria.
- Detected at 10 sites in 2019. A watershed-specific POC at six of them.

**Malathion**

- **Common trade names:** Malathion, Fyfanon
- **Example uses within watershed:** alfalfa, apples, corn, grass hay, potato, wheat
- Malaoxon, a malathion breakdown product, is more toxic to organisms than its parent compound. Malaoxon was detected almost every time malathion was detected 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.

**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

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 statewide POC detected. The ‘X’ cells indicate data results that failed lab quality assurance measures. 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 2019, 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.

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.

Please see agr.wa.gov/AgScience for more information.
### Lower Crab Creek crop groupings | acres

<table>
<thead>
<tr>
<th>Crop Grouping</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>11,756</td>
</tr>
<tr>
<td>Cereal / Grain</td>
<td>35,758</td>
</tr>
<tr>
<td>Hay / Silage</td>
<td>23,808</td>
</tr>
<tr>
<td>Orchard</td>
<td>18,298</td>
</tr>
<tr>
<td>Pasture</td>
<td>8,221</td>
</tr>
<tr>
<td>Vegetable</td>
<td>12,238</td>
</tr>
</tbody>
</table>

**Total Agriculture** | **110,079** 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](https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use)