Big Ditch drains directly into Puget Sound and is tidally influenced. The Skagit Valley (including the Big Ditch watershed) is a major pit stop for migratory waterfowl, including trumpeter swans, tundra swans, snow geese, and other birds.

**Site information:**

In 2020, Washington State Department of Agriculture (WSDA) monitored 16 sites in Washington. Upper Big Ditch was one of three monitoring sites located in Skagit County.

**Years sampled:** 2007 – present

**Fish habitat:** Chinook, coho, chum, and pink salmon; and steelhead (SalmonScape: apps.wdfw.wa.gov/salmonscape)

**Sampling dates:** 26 weeks, June 16 – December 7

- 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 59 unique chemicals detected with a total of 499 detections in Upper Big Ditch. Of these, 5 detections were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Upper Big Ditch was sampled. Between 10 and 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 established detection frequencies.

**Watershed-specific POCs in Upper Big Ditch:**

**Bifenthrin**
- Common trade names: Sniper
- Example uses within watershed: market crops, grass
- Bifenthrin has extremely low solubility in water. Contamination is likely from bifenthrin bound to the soils in runoff.
- Detected at two sites in 2020. A watershed POC at both of them.

**Imidacloprid**
- Common trade names: Admire Pro, Gaucho, Merit
- Example uses within watershed: nursery/orchamental, residential
- Detected at 13 sites in 2020. A watershed POC at 11 of them.

**Fluvalinate**
- Only toxic before product dries
- Common trade names: Mavrik
- Example uses within watershed: nursery/orchamental, building perimeters, beehives, residential
- Detected at seven sites in 2020. A watershed POC only at Upper Big Ditch.

**Sulfometuron-methyl**
- Common trade names: Oust, Spyder
- Example uses within watershed: asphalt/cement, right-of-way, turf, sewer
- Detected at seven sites in 2020. A watershed POC only at Upper Big Ditch.

**Thiamethoxam**
- Common trade names: Actara, Cruiser, Platinum
- Example uses within watershed: market crops
- Thiamethoxam has been found in groundwater and surface water samples in Washington.
- Detected at nine sites in 2020. A watershed POC at two of them.
### Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

<table>
<thead>
<tr>
<th>Month</th>
<th>Day of the Month</th>
<th>Use*</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<td></td>
<td></td>
<td>I</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>H</td>
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</tbody>
</table>

* I: Insecticide; H: Herbicide

**Exceeds assessment criteria**

**Below assessment criteria**

The calendar at right shows the concentration in µg/L and date sampled of each watershed POC detected. The “–” identifies data that could not be collected or analyzed. 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.

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

<table>
<thead>
<tr>
<th></th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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<td>14</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

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 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.
### Upper Big Ditch crop groupings | acres

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Other</td>
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<tr>
<td>Nursery</td>
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<tr>
<td>Pasture</td>
<td>11</td>
</tr>
<tr>
<td>Turfgrass</td>
<td>6</td>
</tr>
<tr>
<td>Vegetable</td>
<td>11</td>
</tr>
</tbody>
</table>

**Total Agriculture**  48 acres

**Watershed Total**  2,040 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