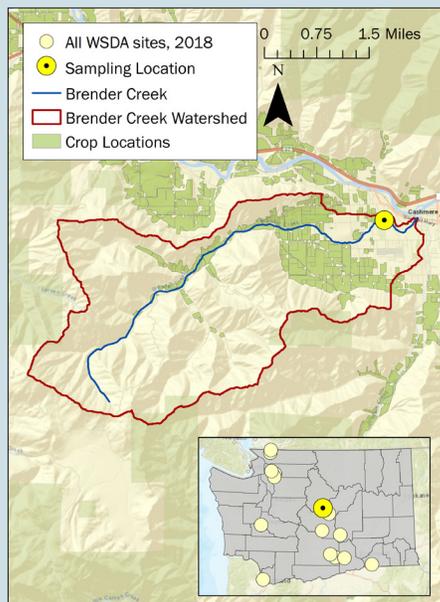
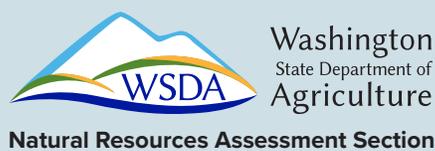


# Upper Brender Creek

Summary of 2018 Surface Water Monitoring Program Results | November 2019



The Washington State Department of Agriculture (WSDA) routinely monitors surface water throughout the state for the presence of pesticides. The monitoring is done between March and September, the typical season for pesticide use, and includes checking general water quality conditions and streamflow. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State. In 2018, WSDA monitored 16 sites in Washington, three of them in Chelan County.



## Watershed and site information

**Sampling history:** 2016 - present

**Watershed area:** 6,900 acres (~11 square miles)

**Area in agricultural use:** 900 acres (~13% of total watershed acreage)

**Main crops:** Pears, apples, pasture, and cherries

**Fish habitat:** Spring Chinook salmon and summer steelhead  
(SalmonScape: [apps.wdfw.wa.gov/salmonscape/](https://apps.wdfw.wa.gov/salmonscape/))

**Sampling dates:** 24 sampling visits, March 13 – Aug. 21

### Water testing:

- WSDA tested for 130 current and legacy chemicals (50 insecticides, 43 herbicides, 20 fungicides, 13 pesticide degradates, 2 synergists, 1 antimicrobial, and 1 insect repellent).
- Samples were analyzed at Manchester Environmental Lab, Port Orchard, Washington.
- 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.
- WSDA identifies Pesticides of Concern (POCs) as current-use pesticides that have been found somewhere in the state above WSDA's assessment criteria in recent years.

### Notes:

- DDT was widely used in orchard production until it was banned in the U.S. in 1972. It is still detected in the Brender Creek watershed due to the chemical's strong soil binding abilities, combined with soil erosion into the adjacent stream.
- See WSDA's study in collaboration with the Cascadia Conservation District on DDT retention in wetlands: [cms.agr.wa.gov/WSDAKentico/Imported/676BrenderUpperLowerDDT2016.pdf](https://cms.agr.wa.gov/WSDAKentico/Imported/676BrenderUpperLowerDDT2016.pdf)

## Results and Conclusions

- There were 267 total pesticide detections in Brender Creek from 5 different use categories: 11 types of herbicides, 5 fungicides, 14 insecticides, 5 degradates, and 3 other pesticide-related chemicals. This substantial increase from 2017 is largely due to new equipment at the lab and does not necessarily reflect an increase in pesticide use.
- Of the total pesticide detections, 89 were above WSDA's assessment criteria. DDT and its degradates account for 69 of those exceedances.
- The POCs chlorpyrifos, diazinon, etoxazole, imidacloprid, malathion, metolachlor, pyraclostrobin, pyridaben, pyriproxyfen, tefluthrin, and thiamethoxam were detected.
- The detections of chlorpyrifos, etoxazole, imidacloprid, malathion, and pyridaben that were higher than WSDA's assessment criteria occurred only in the first half of the pesticide use season.
- Chlorpyrifos, imidacloprid, malathion, and pyridaben have also been detected in previous years at concentrations known to negatively affect aquatic life.

## Recommendations

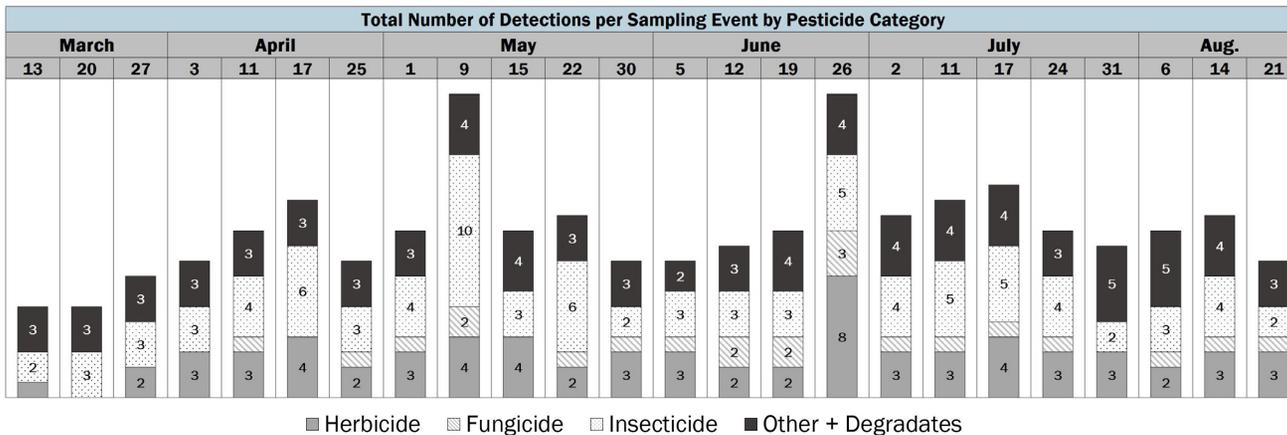
- **Make use of natural protections**
  - Use buffers, filter strips, sediment basins, ground cover, and setbacks.
- **Be informed**
  - Read and follow pesticide label directions, and be familiar with active ingredients.
  - Plan applications using the weather forecast to reduce the chances of drift or runoff.
  - Review WSDA's POCs and choose less-toxic pesticides when possible.
- **Care for your equipment and products**
  - Calibrate, maintain, and inspect application equipment regularly.
  - Properly dispose of all unneeded pesticides. Visit [agr.wa.gov/wastepesticide](https://agr.wa.gov/wastepesticide) to learn about waste pesticide collection events.

The calendar below shows the concentration in µg/L and date sampled of each WSDA 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. The “-” signifies a sample or measurement that was not collected or could not be analyzed.

Washington State's Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations																									
Month		March			April				May				June				July				Aug.				
Day of the Month	Use*	13	20	27	3	11	17	25	1	9	15	22	30	5	12	19	26	2	11	17	24	31	6	14	21
Chlorpyrifos	I		0.011	0.249	0.261	0.190	0.059	0.033	0.129	0.033	0.020	0.018	0.010	0.008	0.008	0.007	0.007	0.007	0.005	0.004	0.003	0.003	0.003	0.003	0.003
Diazinon	I						0.005		0.005	0.002									0.002	0.003					
Etoxazole	I										0.123				0.004	0.007	0.011	0.014	0.008	0.005					
Imidacloprid	I									0.006															
Malathion	I	0.005	0.024	0.236	0.086	0.016	0.006			0.086	0.003														
Metolachlor	H																0.001								
Pyraclostrobin	F									0.005						0.010									
Pyridaben	I				0.069	0.029	0.033	0.029	0.065		0.101			0.031			0.004	0.005	0.004					0.005	
Pyriproxyfen	I															0.003					0.003				
Tefluthrin	I																					0.001			
Thiamethoxam	I								0.036											0.018					
Total suspended solids (mg/L)		94.0	44.0	57.0	66.0	73.0	45.0	37.0	169.0	86.0	39.0	86.0	42.0	37.0	52.0	33.0	78.0	58.0	42.0	35.0	23.0	23.0	48.0	19.0	54.0
Streamflow (cubic ft/sec)		2.27	2.69	2.69	2.72	3.06	2.66	2.26	5.39	6.47	2.93	5.69	2.40	1.41	4.63	2.05	3.56	5.03	3.31	1.40	1.60	0.91	3.93	-	-
Precipitation (total in/week)		0.07	0.12	0.44	0	0.65	0.72	0	0.22	0.17	0.17	0.76	0	0	0.14	0.09	0.01	0.01	0	0	0	0	0	0	0

■ Exceeds Assessment Criteria    □ Below Assessment Criteria  
 (\* F: Fungicide, H: Herbicide, I: Insecticide)

The graph below 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. Bars without data labels represent one detection for that sampling visit and pesticide category.



In the triangle to the right, pesticides in the top section have one or more detections above WSDA assessment criteria. The total number of detections for each pesticide is in parentheses after the name, with more frequently detected pesticides listed first in each section.

Please see [agr.wa.gov/AgScience](http://agr.wa.gov/AgScience) for more information.

