Lower Big Ditch

APRIL 2023

Summary of 2021 Surface Water Monitoring Program Results

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.

In 2021, Washington State Department of Agriculture (WSDA) monitored 18 sites in Washington. Lower Big Ditch was one of three monitoring sites located in Skagit County.

Samples were analyzed at the 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.

Site information:

Years sampled: 2006 – present

Fish habitat: Fall Chinook, coho, fall chum, kokanee, and pink salmon; and winter steelhead trout (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:
17 weeks, April 5 – June 28 and September 21 – October 12

Water testing:
Samples were tested for 170 current and legacy chemicals (59 insecticides, 58 herbicides, 23 fungicides, 19 pesticide degradates, 6 legacy chemicals, 2 synergists, 1 antimicrobial, 1 insect repellent, and 1 wood preservative).

Products listed are for descriptive purposes only and do not imply endorsement by the author or the Department of Agriculture.

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Results:

- There were 59 unique chemicals detected with a total of 347 detections in Lower Big Ditch. Of these, 26 detections were above WSDA assessment criteria. Roughly 65% (17 detections) of exceeding detections were from DDT and its degradates.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Lower Big Ditch was sampled. Between 4 and 41 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 Lower Big Ditch:

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

Bifenthrin - Insecticide

- *Common trade name:* Sniper
- *Example uses within watershed:* corn, pasture, market crops, potato
- Bifenthrin has extremely low solubility in water. Contamination is likely from bifenthrin bound to the soils in runoff.
- Also a watershed POC in three other monitored watersheds.

Diuron - Herbicide

- *Common trade names:* Direx, Karmex
- *Example uses within watershed:* cereal grain, corn, right-of-way
- This chemical can transport into the environment via drift or runoff and can contaminate groundwater. Diuron has been found in groundwater in Washington State.
- Also detected in nine other monitored watersheds and a POC in six of them.

Fipronil - Insecticide

- *Common trade name:* Termidor
- *Example uses within watershed:* ornamental tree, asphalt/cement, residential
- Three breakdown products of fipronil can be just as toxic to certain organisms in the environment as fipronil. In 2021, all three of these were detected at this site below WSDA assessment criteria.
- Also detected in six other monitored watersheds and a POC in three of them.

Imidacloprid - Insecticide

- *Common trade names:* Admire Pro, Gaucho, Merit
- *Example uses within watershed:* cereal grain, corn, nursery/ornamental, residential
- Also detected in 13 other monitored watersheds and a POC in 10 of them.

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The calendar at right shows the concentration in µg/L and date sampled of each watershed POC detected. This calendar does not include all the pesticides WSDA found during the growing season. The "–" identifies data that could not be collected or analyzed. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems. The measured streamflow varied across sampling events due to tidal influence at the site.

[** H: Herbicide; I: Insecticide*]

exceeds assessment criteria

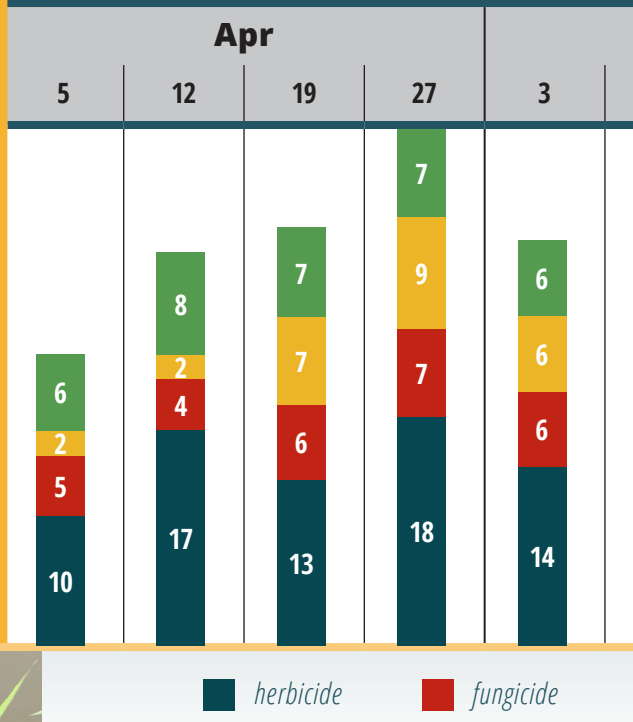
below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Sampl

Month ▸		Apr				
Day of the Month ▸	Use*	5	12	19	27	3
Diuron	H	0.036	0.041	0.020	0.034	0.017
Fipronil	I	0.004	0.004	0.007	0.007	0.007
Imidacloprid	I				0.012	
Suspended sediment concentration *(mg/L)*		-	-	19	17	40
Streamflow *(cubic ft/sec)*		9.6	6.6	3.6	4.5	2.7
Precipitation *(total in/week)*		0.01	0.50	0	0.65	0.11

The graph at right shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes legacy, 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.

Total Number of Detections per Sampling E



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.

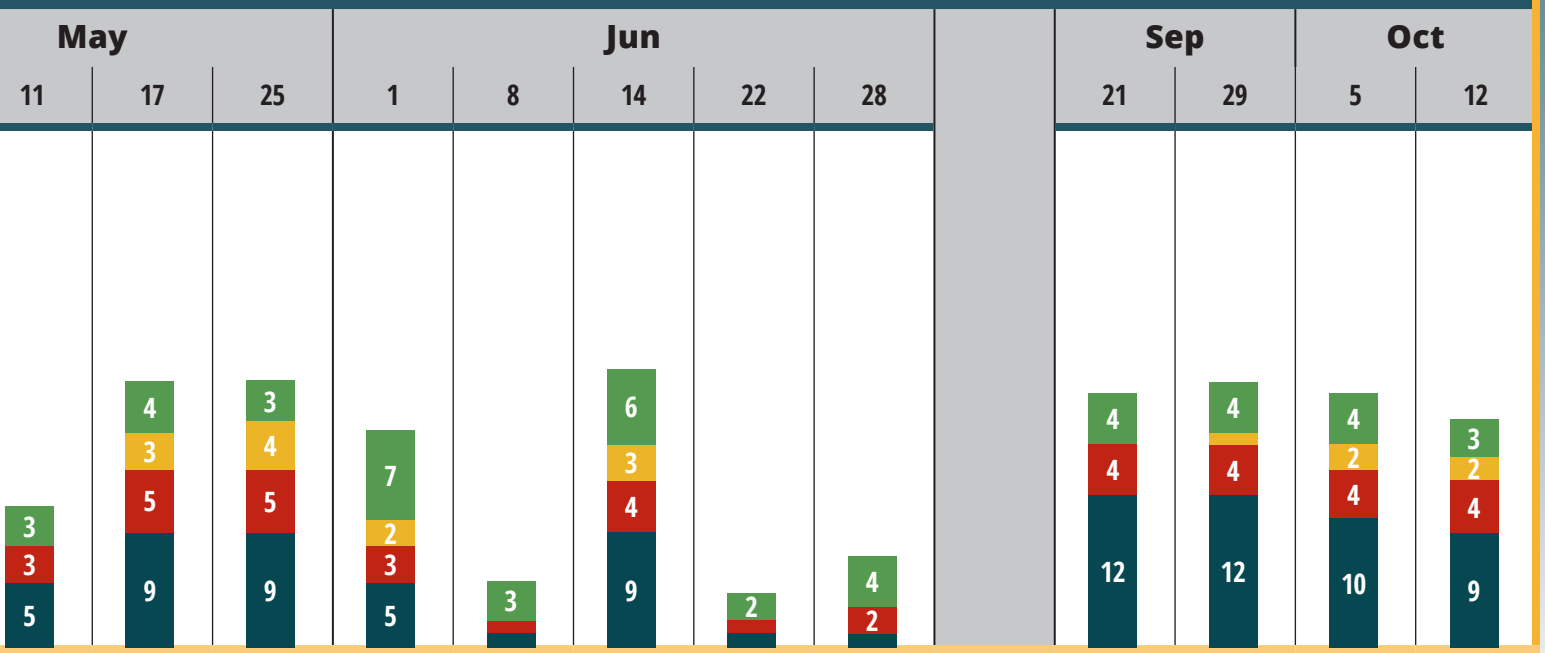
Be informed

- 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.

ling Dates and Concentrations

	May			Jun					Sep		Oct	
	11	17	25	1	8	14	22	28	21	29	5	12
7	0.007	0.004	0.004			0.006				0.009	0.008	0.007
7			0.007	0.024		0.011						
											0.067	0.018
	15	13	10	14	15	8	10	13	2	3	2	5
	9.5	20.8	9.5	10.2	25.4	14.3	-	20.2	-	-	2.9	4.2
	0.33	0	0.39	0.12	0.26	0.30	0.05	0	1.64	0.86	0.64	0.83

Event by Pesticide Category



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

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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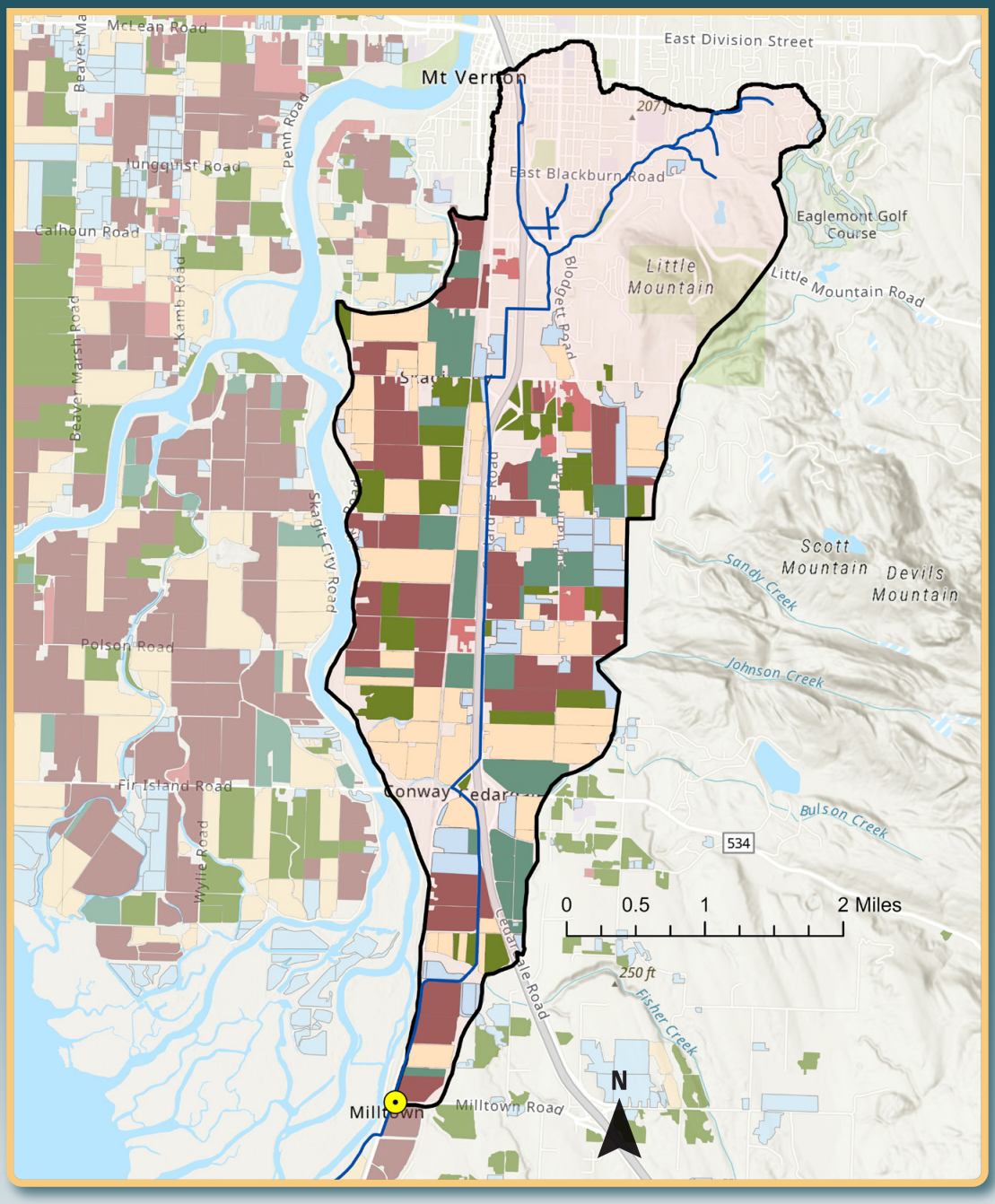

Lower Big Ditch crop groupings	acres
Other	381
Cereal Grain	1,261
Hay / Silage	556
Nursery	113
Seed	673
Vegetable	1,147

- Sampling Location
- Big Ditch
- Lower Big Ditch Watershed

Total Agriculture	4,130	acres
Watershed Total	**8,012**	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