

Indian Slough

APRIL 2021

Summary of 2019 Surface Water Monitoring Program Results



The Skagit Valley (including the Indian Slough watershed) is also a major pit stop for migratory waterfowl, including trumpeter swans, tundra swans, snow geese, and other birds. Indian Slough water releases directly into Puget Sound and is tidally influenced. New Zealand mud snails, an invasive aquatic species, were observed in the slough upstream from the monitoring site.

Watershed and site information:

In 2019, Washington State Department of Agriculture (WSDA) monitored 16 sites in Washington. Indian Slough was one of three monitoring sites located in Skagit County.

Years sampled: 2006 – present

Fish habitat: Chinook and coho salmon
(SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates:

24 weeks, March 25 – September 10

Water testing:

- Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Wash.
- 159 current and legacy chemicals (56 insecticides, 58 herbicides, 21 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 605 detections in Indian Slough. Of these, 22 were above WSDA assessment criteria.
- When multiple pesticides are detected simultaneously, the environmental effects can combine; multiple pesticides were detected every week Indian Slough was tested. Between 13 to 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 certain detection frequencies.

Watershed-specific POCs detected in Indian Slough:

ICONS FOR ENVIRONMENTAL HAZARDS LISTED ON PESTICIDE LABELS



Diuron

- Common trade names:* Direx, Karmex
- Example uses within watershed:* blueberry, corn, cucumber, nursery, market crops, right-of-way
- This chemical can transport into the environment via drift or runoff and can contaminate groundwater.
 - Diuron has also been found in groundwater in Washington State.
- Detected at 13 sites in 2019. A watershed POC at two of them.

Fipronil

- Common trade names:* Termidor
- Example uses within watershed:* ornamental tree, asphalt/cement, commercial, residential
- Three breakdown products of fipronil can be just as toxic to certain organisms in the environment as fipronil. In 2019, two of these were detected at this site below WSDA assessment criteria.
- Detected at seven sites in 2019. A watershed POC at two of them.

Imidacloprid

- Common trade names:* Admire Pro, Gaucho, Merit
- Example uses within watershed:* berry, corn, potato, wheat, residential
- Detected at 11 sites in 2019. A watershed POC at nine of them.

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



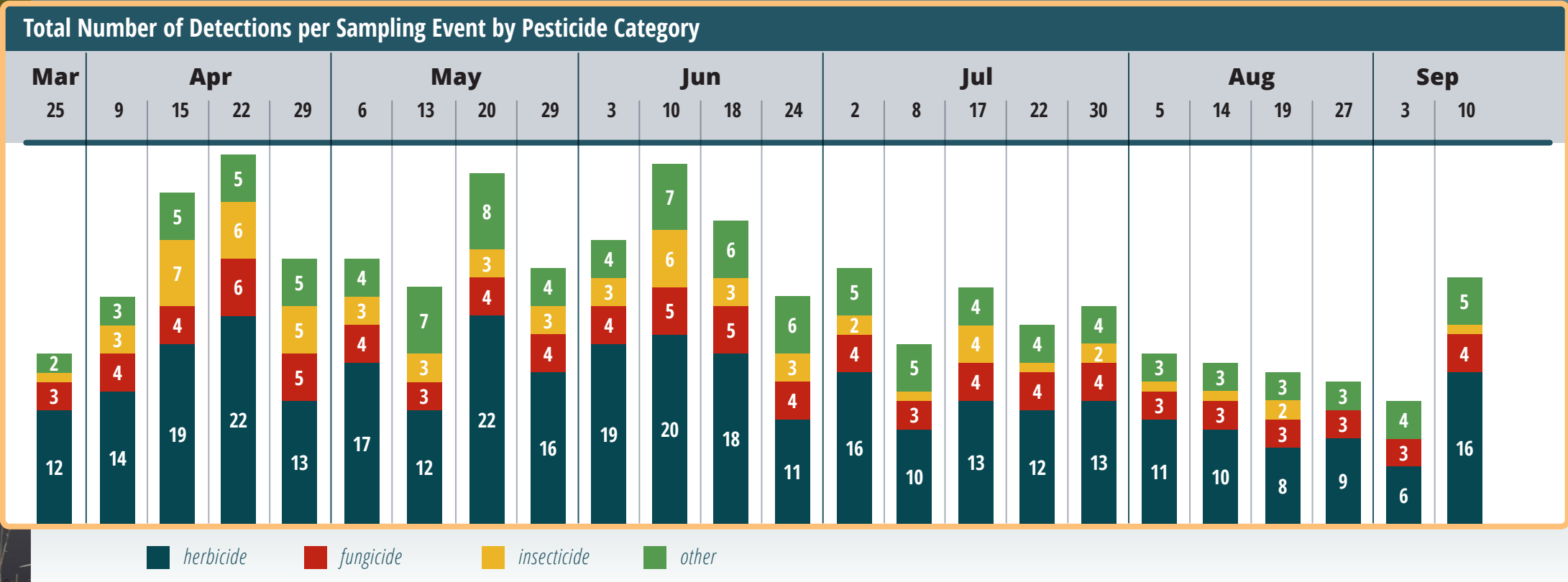
NATURAL RESOURCES ASSESSMENT SECTION

The calendar at right shows the concentration in µg/L and date sampled of each watershed POC. The “-” identifies a sample that could not be 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. The measured streamflow is erratic each sampling event due to tidal influence at the site. Instream vegetation prevented staff from measuring streamflow several times during the summer.

[* H: Herbicide; I: Insecticide]
exceeds assessment criteria
below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations																											
Month ▶		Use*	Mar	Apr					May				Jun				Jul					Aug				Sep	
Day of the Month ▶	25		9	15	22	29	6	13	20	29	3	10	18	24	2	8	17	22	30	5	14	19	27	3	10		
Diuron	H	0.011	0.008	0.035	0.025	0.011	0.010	0.008	0.010	0.014	1.290	0.364	0.333	0.099	0.110	0.041	0.025	0.026	0.027	0.017	0.011	0.010	0.009		0.119		
Fipronil	I			0.006	0.006	0.005						0.004															
Imidacloprid	I		0.004	0.013	0.011	0.004	0.009	0.013	0.038	0.009	0.019	0.066	0.011	0.008	0.004		0.008										
Total suspended solids (mg/L)		13	11	8	8	8	11	12	8	9	8	6	6	7	6	5	7	7	6	14	9	6	10	15	8		
Streamflow (cubic ft/sec)		47.4	61.6	83.7	57.3	44.3	24.5	12.5	17.5	13.6	16.0	--	--	--	9.9	--	--	--	--	2.8	5.4	5.9	4.1	0.7	34.2		
Precipitation (total in/week)		0	0.47	1.47	0.6	0.04	0	0	0.39	0.33	0	0.93	0	0.04	0.45	0.14	0.24	0.41	0	0.17	0.15	0	0.35	0.19	1.94		

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 leaves out.

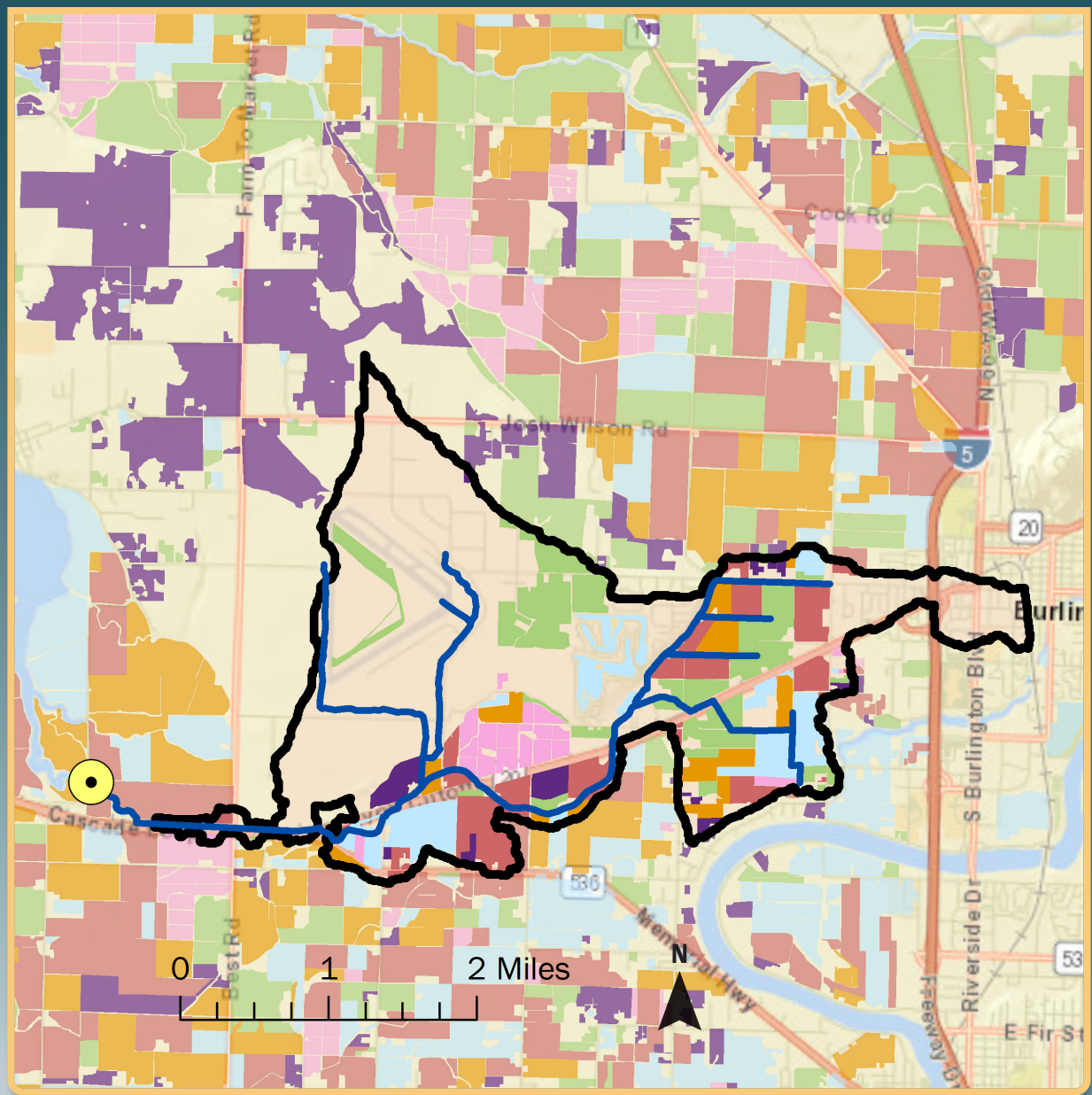
Be informed

- 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.

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



Indian Slough crop groupings | acres

■	Other	383
■	Berry	181
■	Cereal / Grain	231
■	Hay / Silage	586
■	Pasture	116
■	Vegetable	480

- Sampling Location
- Indian Slough
- Indian Slough Watershed

Total Agriculture 1,977 acres

Watershed Total 5,025 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>