Idaho State Department of Agriculture
Surface Water Pesticide Fact Sheet
Henry's Fork – Teton Rivers, 2017

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ISDA Surface Water Fact Sheet

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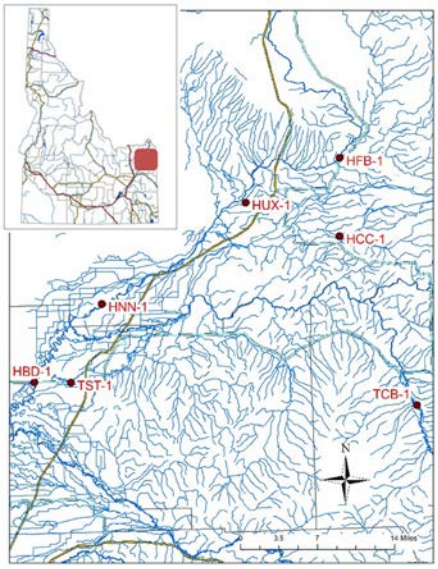
Background

In 2017, the Idaho State Department of Agriculture (ISDA) conducted water quality monitoring for pesticide residues at seven (7) locations in the Henry's Fork and Teton River Subbasins (Figure 1). This study was designed to determine if potential contributing areas into these mainstem locations could be identified. The majority of acreage in these subbasins is used in agricultural production; therefore, the initial concerns were that pesticide residues were reaching the surface waters in these subbasins. The riverine sites were monitored at seven (7) locations in the subbasins, Upper Henry's Fork Subbasin 17040202 – Lower Henry's Fork 17040203 – and Teton 17040204 (Figure 1). Portions of these greater subbasins reside in areas outside of the borders of Idaho and no determination of sources from these locations is intended or implied, nor were they expected. The areas outside of Idaho either border or are within Yellowstone National Park or Grand Teton National Park which are expected to have limited pesticide applications.



The monitoring project was designed to make an initial identification of potential contributing areas within the subbasins. Mainstem monitoring locations on the Henry's Fork River were at: Beaver Dick Park at Highway 33 (HBD-1), near Fort Henry at N 1900 E/Red Road (HNN-1), and below the confluence with Warm River (HFB-1) (Figure 1). Additional tributary monitoring within the Henry's Fork River Subbasin included Conant Creek below the confluence with Squirrel Creek (HCC-1), and an Unnamed Tributary near Ashton (HUX-1) (Figure 1). While the Teton River was monitored at Cache Bridge/Packsaddle Rd (TCB-1), and the South Fork Teton near Highway 33 (TST-1) (Figure 1). Any findings will be used to focus ISDA outreach, training and future monitoring. ISDA uses the US Environmental Protection Agency (EPA) Aquatic Life Benchmarks to describe the water quality of these rivers and streams.

The five-mainstem locations in the Henry's Fork or Teton Rivers had 60 samples collected; each sample was analyzed for nearly 110 pesticide compounds. The other two locations were tributaries to either Falls River (a tributary of the Henry's Fork) or directly into the Henry's Fork River. These two locations had combined 21 samples collected

Figure 1. Monitoring locations in the Henry's Fork – Teton River Subbasins.

Results

The one identified chemical was the metabolite 2,4-DCBA (Dichlorobenzoic Acid), which is known to be a breakdown product during the degradation of several pesticides, such as Propiconazole. The 2,4-DCBA was detected in the Henry's Fork River at the Beaver Dick Park Access near Highway 33. This was a low-level detection at 54 nanograms per liter (or parts per trillion). It is suspected that Propiconazole was the parent chemical, but this cannot be confirmed. Propiconazole is the active ingredient in several fungicides. An Aquatic Life benchmark has not been defined for 2,4-DCBA.

The 2017 pesticide monitoring results were similar to the USGS monitoring at their *Henrys Fork nr Rexburg ID* (13056500) station, also located at the Beaver Dick Park at Highway 33. Data from this location identified a limited number of pesticides since 2014, the identified pesticides included, 2,4-D, Atrazine, Axozystrobin, and Fipronil (https://waterdata.usgs.gov/id/nwis/uv/?site_no=13056500).

The overall contributing area has been delineated from the furthest downstream location at site HBD-1, so that all other locations were upstream of that location. The contributing watershed was identified for each sample location (Figure 2). These delineated watersheds were developed to identify potential source zones.

Discussion

Based on the initial goals for the 2017 monitoring, the contributing areas between the field sites will be used to determine sub-areas that will then be prioritized for future monitoring. These subareas will then be more intensely monitored to determine sources of pesticides reaching the streams and rivers. As there were limited pesticide detections, other collected data along with land-use data will be used to identify the priority areas for 2018 monitoring (Figure 2). Contributing watersheds overlap so that the area upstream of TST-1 includes the area upstream of TCB-1.

Pesticides of Concern

ISDA defines a pesticide of concern (POC) as any pesticide that is detected at a concentration that is greater than or equal to fifty percent (≥ 50%) of an established US EPA Aquatic Life Benchmark. There were no detected POCs in the 2017 monitoring, at any location. The benchmarks are developed for acute and chronic effects on fish, aquatic invertebrates, and acute effects on vascular and nonvascular plants. Acute toxicity of a pesticide refers to the effects from a single dose or repeated exposure over a short period of time (i.e. a few hours or a day). Chronic toxicity is the ability of a substance to cause adverse health effects resulting from long-term or repeated low levels of exposure.

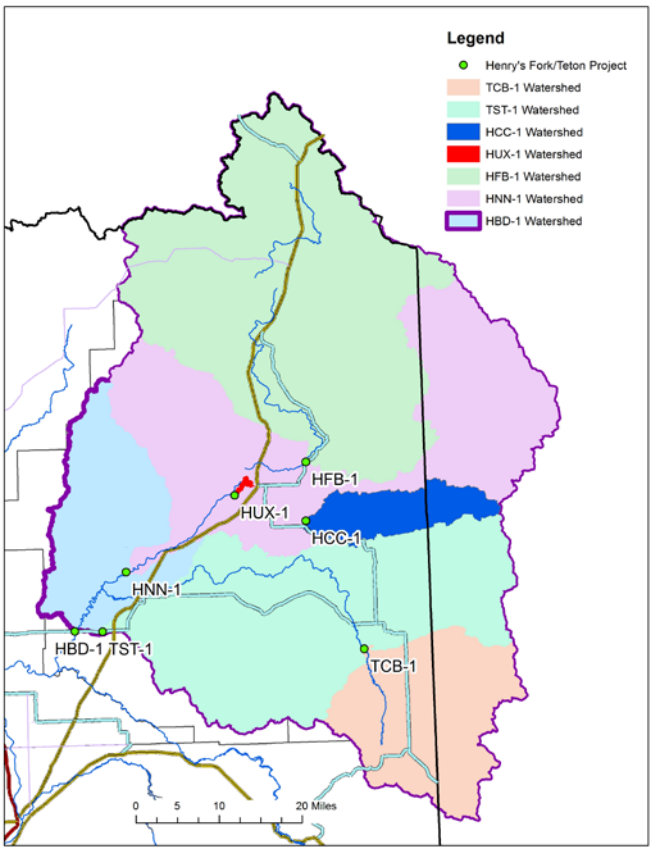


Figure 2. Watersheds and contributing area for each field site.

Conclusions

In 2017, there was only one (1) detection of a pesticide at the seven (7) monitoring locations or site visits. There is not an established US EPA Aquatic Life Benchmark for 2,4-Dichlorobenzoic Acid (2,4-DCBA). There are indications that there is a soil management (erosion) issue in this watershed, and this can move pesticides from their applied locations. Not only can these mobilized pesticides contribute to impairments of downstream uses, but it also means that the economic costs and effectiveness of these pesticides is limited, and adds to the costs of crop production.

There are indications that the snowpack from the winter of 2016/2017 which was significantly greater than normal, may have led to greater than normally expected dilution in the monitored rivers. This snowpack driven dilution has not been confirmed, but it may have contributed to the lower than expected detections of pesticides.

Results from the 2017 monitoring data suggest that there is either very little transport of pesticides from their applied locations into the rivers and streams within the study area, that there is sufficient flow volume within the water to dilute the pesticides reaching those water bodies, or a combination of the two. Monitoring in 2018 is expected to be in tributaries to these mainstem rivers. These streams should have less dilution and better represent conditions of whether there is a concern about pesticide use and management in the greater area.

ISDA will continue to educate landowners and applicators about the potential impacts that pesticides can have on water quality and the environment. ISDA shares our data with the Idaho Department of Environmental Quality (DEQ), US EPA, our cooperators and inspectors. ISDA will continue to monitor waters in the Henry's Fork River and Teton River Subbasins that could affect water quality.

Assessment of potential impacts to the aquatic life and habitat was beyond the scope of this study. However, data are provided to the Idaho DEQ so that they can determine if there are any impairments to beneficial uses associated with the monitored locations for those instances where measured concentration exceeded either the POC or Aquatic Life Benchmark. There were no indications in 2017 that any Aquatic Life benchmarks were exceeded due to pesticides in the Henry's Fork/Teton Rivers Subbasins. Any potential future detections may be assessed against beneficial uses as described in the Idaho Code and DEQ's Water Body Assessment Guidance.

This work could not have been completed without the support of ISDA and the US EPA, their contributions to this report were essential. A special thanks to Jason McDermott for his efforts to complete this project, and Elizabeth Palmateer for her review.

For additional information about this program or projects, please contact Curtis Cooper, Idaho State Department of Agriculture at (208) 332-8597 or email at WaterQuality@isda.idaho.gov