

In 2019, the Idaho State Department of Agriculture (ISDA) conducted a pesticide residue-monitoring program at six (6) locations in the Lemhi River Subbasin. Five (5) locations were in the mainstem of the Lemhi River and one (1) was in a tributary. The locations were south of Salmon, Idaho (Figure 1). The locations were monitored on an every-otherweek basis. Monitoring locations were in the Lemhi River Subbasin (HUC 17060204). The mainstem locations included: Lemhi River at North Saint Charles Street in Salmon, ID (LSC-1), Lemhi River at Baker Lane (LBK-1), Lemhi River above Hayden Creek at the Stream Gage (LHC-1), Lemhi River at Cottom Lane (LCT-1), and Lemhi River near Leadore, ID (LLD-1). The one (1) location not on the Lemhi mainstem was at Hayden Creek near Highway 28 (HAY-1), just upstream of its confluence with the Lemhi River. Monitoring was initiated on May 14, 2019, and samples were collected at these sites through October 1, 2019. The samples were delivered to and analyzed by the Idaho Food Quality Assurance Laboratory (IFQAL), located in Twin Falls, Idaho.

This synoptic monitoring project was designed to determine if pesticide residues were of concern in the subbasins, and if there were any identifiable pesticide concentrations that might have the potential to impact salmonids (especially



oceangoing salmon and steelhead during their younger life-stages). Sites were selected based on advice and recommendations from the Upper Salmon Basin Watershed Program (USBWP). Additional factors were used to identify potential locations, such as land-uses upstream of the monitoring locations. Locations were based on their proximity to agricultural areas or other areas with presumed pesticide applications. Pesticide detections are used to identify source areas. Source areas that could then be used to focus ISDA's outreach and education efforts.

The USBWP takes on projects that benefit entire watersheds, making them healthier and more resilient by boosting fish passage, addressing erosion and water temperature problems, and renewing stream corridors—all in ways that respect agriculture. Their work includes: Riparian habitat restoration, instream habitat improvement, fish-migration barrier removal, instream flow enhancement, and irrigation diversion fish-screening. The USBWP is a communitydriven partnership. Landowners voluntarily work together with local, state, and federal partners who share a vision for common-sense, scientifically sound protection and restoration of our waters. They collaborate to improve habitat for salmon and resident fish while respecting and balancing the needs of irrigated agriculture and strengthening the local economy. The USBWP's staff, affiliated with

the Idaho Governor's Office of Species Conservation, helps landowners develop restoration projects, assists with the permitting process, oversees the work, and monitors outcomes (adapted from the USBWP website).

The Idaho State Department of Agriculture Water Program is dedicated to meeting our Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) obligations. In part, this includes monitoring for pesticides in locales with Endangered and Threatened Species, and communicating and sharing the results and outcomes. The streams and rivers in the 2019 study have been examined for meeting Designated Beneficial Uses by the Idaho Department of Environmental Quality. There are impairments and/or diminished uses in the mainstem of the Lemhi River due to Temperature issues and Bacteria. The 2016 Integrated Report details these assessments.

Results

There were no detections in the 66 samples submitted to IFQAL. Monitoring occurred on an every-other-week basis at each of the six (6) locations. There were 11 monitoring dates in 2019. Each sample is tested for over 100 different pesticides or metabolites.

Discussion

No detections of pesticides occurred in 2019 in any of the samples submitted for analysis at IFQAL. Therefore, no Concerning Detection Level (CDL) pesticide concentrations were identified. ISDA defines a CDL as any pesticide that is detected at a concentration that is greater than or equal to fifty percent ($\geq 50\%$) of an established US EPA Aquatic Life Benchmark. The benchmarks are developed for acute and chronic effects on fish and 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. ISDA has protocols in place to examine pesticide data against Aquatic Life Benchmarks.

Data are provided to the Idaho Department of Environmental Quality for their aquatic habit and stream water quality assessments to help them meet their Clean Water Act obligations. Knowing that there were no identified pesticides aids their assessments of stream habit, and allows for better identification of actual habitat limitations, if any.

Conclusions

Since there were no detections of pesticides or pesticide residues in any of the samples from this study, it is an indication that pesticide applications made to areas surrounding this river and tributaries were being made in accordance to label directions and Best Management Practices (BMPs) recommended to lower pesticide impacts. At this time, there is no evidence that pesticide applications are affecting the aquatic life in any of the streams and rivers examined in this study. However, site-specific issues may exist but cannot be identified on a cost-effective monitoring scale. Care and precautions to protect aquatic resources should remain a high priority for applicators.

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Recommendations

The following items are several precautions that can be taken when applying pesticides:

- Read and follow label directions Always follow label directions for water quality protection.
- Conduct maintenance and calibration of application equipment, match application rates to pest problem.
- Implementation of management strategies Field scouting, evaluation of pest control needs selection of proper pesticide, irrigation management, etc.
- Implement BMPs, including conservation buffers, vegetative filter strips, sediment basins, and pump back systems.
- Avoid runoff due to weather events, excessive irrigation and check the forecast prior to pesticide applications.
- Avoid overspray and drift, do not mix and load near water or in areas that pesticides would access a water source during runoff.

Prevention is the key to protecting Idaho's streams, rivers and aquifers, while maintaining the continued use of pesticide registrations in Idaho. Healthy rivers and streams with invertebrates (EPT insects) help maintain a healthy fishery and recreational use. The authors would like to thank everyone for their diligence to preserve Idaho's natural waters and fisheries. ISDA would also like to recognize the United States Environmental Protection Agency and our various grant supporters, without whose contribution, these reports would not be possible.

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References:

Upper Salmon Basin Watershed Program. <u>https://modelwatershed.idaho.gov/</u>.

Idaho Department of Environmental Quality. 2016 Integrated Report. <u>https://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx</u>.