

# **Spokane Fish Hatchery Case Study or Hatchery Operations as a Source of PCBs to the Spokane River System**

## **This is the original work request from EAP Activity Tracker:**

The SRRTTF is tasked with identifying sources of PCBs and identify the Best Management Practices needed to reduce PCB inputs to the Spokane River. A 2006 report raised concerns about the presence of PCB in fish food, its impact on PCB levels in fish tissue, hatchery water discharge quality, and PCB loads in the Spokane River. A case study of the Little Spokane hatchery is proposed which would address several of the data gaps that exist in the understanding of PCBs in the Spokane River. The proposed study would follow the life cycle of a “batch” of hatchery fish, collecting and measuring levels of PCB congeners in the hatchery source water, fish food, hatchery discharge effluent, and fish tissue samples. This case study would provide answer questions about the impact of hatchery discharge, and provide insight into the relationship between PCB uptake by fish from food and the water column. This study can also shed light on the question of stocked fish in the Spokane River system from other hatcheries by summarizing data regarding where stocked fish are being introduced to the system, the hatchery source of the fish and the potential PCB loading to the system due to stocking.

## **The scope of the project seems to have evolved from the original request.**

### **Proposed Study Objectives:**

- 1) Determine if discharge from the Spokane fish hatchery is a significant source of PCBs to the Little Spokane River
- 2) Evaluate concentrations of PCBs in trout being planted in the Spokane River as a source of PCBs to the system.

To evaluate discharge from the hatchery as a source of PCB,

- 1) Evaluate PCB discharge from hatchery

Settleable solids- collect a single composite sample of sediments from the settling pond(s) and analyze for PCB congeners.

Suspended solids and effluent- collect high volume (~20L) time weighted samples at 3 different times of the year during a period that the hatchery is discharging waste water. The goal of collecting 3 seasonal samples would be to represent temporal variation of PCB concentrations. These samples would be extracted and analyzed using XAD polymeric resin. Solids would be collected and analyzed from the pre-filter and the dissolved fraction would be analyzed from the XAD resin.

- 2) Evaluate hatchery trout as a source of PCBs to the Spokane River system.

~100,000 hatchery trout are raised at Troutlodge and released into Lake Spokane annually.

~55,000-50,000 fertilized eggs are moved from Troutlodge to the Spokane fish hatchery. The fish from Spokane fish hatchery are then planted into Lake Spokane annually.

The SRRTTF has collected 15 trout from Troutlodge and 15 fish from the Spokane Fish Hatchery before the spring, 2015 planting. These fish will be composited as whole fish and analyzed for PCB congeners. Most likely there will be 3 composites of fish analyzed from each hatchery. No additional fish sampling is planned.

It will be important to establish how the fish tissue data will be used to evaluate PCB loading to the Spokane River.

Question: Since this is a put and take fishery some of the fish will be removed from the river as recreational harvest. How will we account for this removal and how should WDFW and the Health Department be involved to deal with potential messaging issues related to PCB concentration in planted trout?

Question: Some of the fish will also be removed by natural predators, e.g. Osprey, Eagle, Heron, and Otter. How will the load calculation account for this removal?

Question: Can we drop sampling of hatchery source water as PCB levels are likely below detection levels in Griffith Springs Water? If there was a significant PCB concentration in the source water it would be detected in the effluent as part of the total PCB load contributed by the hatchery.

Question: Can we drop analysis of fish food since this would be reflected in fish and effluent?

### **Information from the UPLAND FIN-FISH HATCHING AND REARING GENERAL PERMIT- -draft 2015**

#### **S6.C. PCB Reduction Activities and BMPs**

All existing facilities discharging to waterbodies on the CWA 303(d) list for PCBs must implement procedures to eliminate, to the maximum extent possible, the release of Polychlorinated Biphenyls (PCBs) from any known sources in the facility; including paint, caulk, or feed, that come in contact with water.

This project will benefit the Spokane Fish Hatchery by evaluating PCB leaving the hatchery, it is important to understand there is potential for PCB levels to change over time.

- Monitoring all products (fish tissue) and discharge (effluent and solids) for PCB will identify if there is a need to track sources in more detail, i.e. analyze paint, caulk, source water, fish food, etc... in order to identify sources to the hatchery which can then be reduced to the greatest extent possible.
- It is important to consider that **PCB concentrations in the fish food will change over time**. As different forage fish and fishing industry by-products are used to formulate fish food, the PCB concentration of the fish food will change. This is a result of the variation in the PCB concentrations of the fish and other products used to make the fish food. **The fact that PCB is ubiquitous in the environment makes it virtually impossible to completely eliminate PCB in fish food** if fish and/or fish by-products are used to make the fish food used at the hatchery.
  - Fish tissue PCB concentrations in the hatchery fish will show the most dramatic change as fish food PCB concentrations change.
  - Effluent and solid waste PCB concentrations will display a less pronounced change as a result of changes in PCB levels in fish food.

