Idaho State Department of Agriculture
Second Round of Pesticide Residue Evaluation
Clearwater Basin
North Central Idaho
April 5 through July 18, 2006

Prepared by
Kirk Campbell ISDA

ISDA Technical Report Summary W-19 **May 2007**

Introductions

During the period from April 5, 2006 through July 18, 2006 the Idaho State Department of Agriculture (ISDA) conducted a second round of water quality monitoring to determine the presence of pesticide residue within six tributaries of the Clearwater River. The Clearwater River Basin is located in north-central Idaho and covers 9,645 square miles. The six tributaries monitored during this program encompass approximately 317,396 acres with 139,412 of those acres involved in agricultural activities (Table 1).

Technical support for this project was provided by the Idaho Association of Soil Conservation District (IASCD-Moscow), Soil Conservation Commission (SCC-Moscow) and the University of Idaho Analytical Science Laboratory (UIASL).

ISDA, with the above mentioned cooperators, conducted a similar study in 2004 (ISDA Technical Report W-12) which evaluated eight tributaries that discharge into the Clearwater and the South Fork of the Clearwater River.

The 2006 study focused on six new tributaries: Sweet Water Creek (SWC), Six Mile Creek (SMC), Mission Creek (MC), Holes Creek (HC), Little Canyon Creek (LCC), and Big Bear Creek (BBC) (Figure 1). These creeks were chosen based on agricultural acreage, potential pesticide usage, possible salmonid fish population, and current listing on the State of Idaho 303(d) list for possible pesticide impairment (Table1). Five of the six streams had originally been 303(d) listed or are currently listed in Section 5 of the state's integrated report for impaired waters. The streams that were or are currently listed are: SWC, SMC, MC, HC, and LCC. Big Bear Creek was monitored due to its value as a salmonid spawning stream.

Analytical and Field Methods

Analytical methods and techniques used for this study were those outlined in ISDA Technical Report W-12 and consisted of the following: EPA method 507 modified, EPA 632 modified, EPA 508 modified, and EPA 515.2. With the exception of samples collected on May 16, 2006 all other samples met holding times and conformed to the appropriate QA/QC project requirements.

Table 1. Monitoring sites statistics.

Monitoring Sites	Total Acres	Agricultural Acres	% Agricultural Land	Salmonid Activity	303(d) listed or Section 5
Holes Creek	13,948	13,665	97%	X	X
Little Canyon Creek	63,890	48,427	76%	X	X
Mission Creek	59,334	15,768	26%	X	X
Sweetwater Creek	61,751	11,372	18%	X	X
Six Mile Creek	17,592	10,325	58%	X	X
Big Bear Creek Include Little Bear	100,881	39,837	39%	X	

GIS coverage provided by Bill Dansart SCC-Moscow

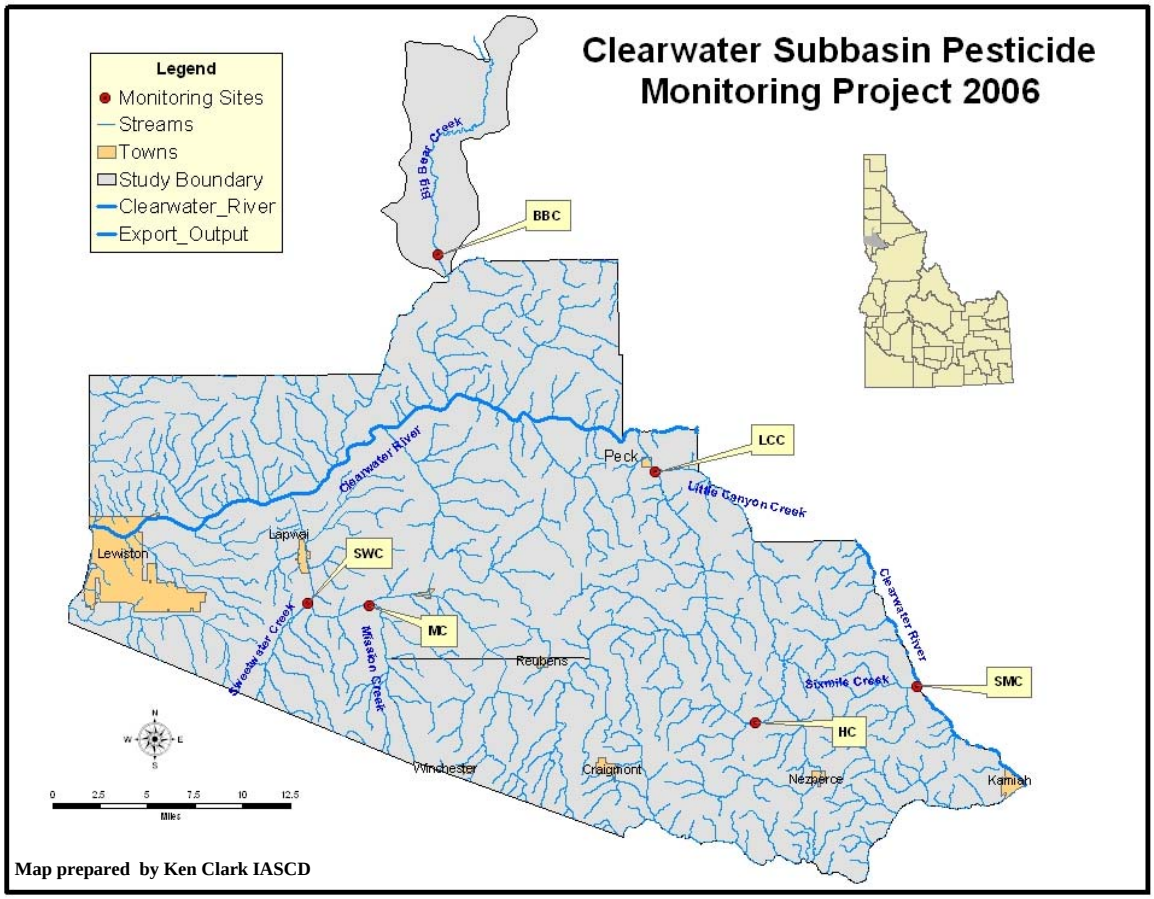

Figure 1. Clearwater River tributary sampling sites.

The May 16, 2006 samples for pesticides by GC/MSD and GC/FPD extractions met the appropriate holding time. Chemist oversight caused exceedance in the holding time requirements between extraction and instrumental analysis. The results for 507/508 analyses showed no detectable residues.

Field techniques followed the guidance outlined in the Quality Assurance Project Plan for the Clearwater River Watershed Monitoring Project February 20, 2006 and as outlined in ISDA Technical Report W-12. All quality control samples including bottle and equipment blanks were reported at below detection limit (BDL). All duplicate sample results fell within an acceptable range (<10%) for relative percent difference (RPD) calculations.

Results

A total of 48 samples were collected over the four month period from the six tributaries involved in this study. With the exception of samples collected on June 6, 2006 all results were below method detection limits (BDLs). Depending on the analytical method, detection limits ranged from 0.25 parts per billion (ppb) to 0.015 ppb.

On June 6, 2006 low levels of the herbicide 2,4-D were detected at Mission Creek, Holes Creek, Six Mile Creek, and Big Bear Creek (Table 2). A low level of the insecticide Dimethoate was also detected during the same period from Big Bear Creek. The concentrations of all the detections where well below any aquatic reference dose (LC-50, 96 hours) for acute levels on rainbow trout (Table 2). LC-50 is the concentration of a chemical estimated to be lethal to 50 percent of the test organisms after 96 hour exposure. The herbicide 2,4-D is widely used to control weeds in a variety of applications. Dimethoate is used to control a large range of insects and is considered

Table 2. Pesticide detections Clearwater Tributaries.

Location	Compound Detected	Concentration Detected	Reference Dose Bioassay 96 hr. LC50 Acute Levels Rainbow Trout
Mission Creek	2,4-D	0.79 ppb	250 ppb
Holes Creek	2,4-D	0.28 ppb	250 ppb
Six Mile Creek	2,4-D	0.51 ppb	250 ppb
Big Bear Creek	Dimethoate	0.13 ppb	6,200 ppb
Big Bear Creek	2,4-D	0.28 ppb	250 ppb

moderately toxic to freshwater fish on an acute basis at a concentration ranging from 6,000 to 7,500 ppb.

The results from the June 6th monitoring were the only pesticide detections during this program. The fact that they were all detected on the same day may be a result of weather conditions prior to sample collection. Precipitation records from the Lewiston Airport and the Agri-Met station at Dworshak Reservoir indicate on and off rain during the four days prior to the sampling date of June 6, 2006. From June 2nd through June 5th Lewiston airport reported a total of 1.02" of rain and Dworshak reported 0.82" of precipitation. The level of precipitation may have been sufficient to transport pesticide residues into these bodies of water.

Conclusions

The overall results from this study tend to indicate that pesticide residues do not appear to be entering Clearwater tributaries at levels that may cause acute or chronic problems for aquatic species. The study does indicate that residue transport, when it does occur, is probably primarily driven by wet weather conditions. The eight tributaries monitored in 2004 along with the six tributaries evaluated in 2006 appear to indicate that pesticide contamination of water ways within the Clearwater Basin is not occurring at levels that would be of concern for aquatic species survival.

Acknowledgements

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