

**Idaho Department of Fish and Game,
July – September, 2004**

Kootenai River Fisheries Recovery Investigations

Quarterly Progress Report and Summary of Activities

Project Personnel:

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Field Work Completed or in Progress and Summary of Results

Burbot

Examination of burbot *Lota lota* telemetry was completed during this quarter. Although 12 burbot were monitored, including one tagged in 2001, eight burbot were of particular importance because of their close proximity for the entire spawning period. Burbot monitored at the base of Ambush Rock (fish # 214, 238, 312, 314, 315, 316, 317, and 318) were not captured in the same location but were in the same location soon after tagging. These eight burbot were located at rkm 244.6 in January and 244.5 in February, at that time water temperature ranged from 1.7 to 3.5°C. Burbot 315

dropped down stream to rkm 239 during late January but returned to the group of burbot before mid-February. Of these eight fish five stayed through May at Ambush Rock with the exception of burbot 315 and 318 that moved downstream in early March, at a temperature of about 5°C, while burbot 316 moved downstream in late March. These data suggested these burbot were a part of perhaps a larger group, consisting of a “spawning ball”, and was further documentation that Ambush Rock is a second known spawning location (the first known location is the Goat River).

Ecosystem Rehabilitation

On July 21-23, 2004 the International Kootenai River Ecosystem Rehabilitation Team (IKERT) met to make final preparations for moving forward with nutrient enhancement efforts on the Kootenai River. Josh Korman and Carl Walters (well known ecosystem modelers) covered scenarios and possible outcomes (positive and negative) with regards to fertilizing the Idaho section of the Kootenai River.

Results from fertilizer samples of ammonium polyphosphate ($\text{NH}_3\text{P}_2\text{O}_5\cdot 6\text{H}_2\text{O}$) analyzed by ALS Environmental in BC for metals, showed very low levels of metals. This information indicates that metals levels in the river will change very little (<2%) when fertilizer is mixed during the descending Kootenai River flows (late June – August).

The first week of August, 22 mountain whitefish were surgically implanted with

radio tags and released at rkm 265 and 250 (Hemlock Bar and Cow creeks). Twenty of the 22 marked fish made large downstream movements of 10 rkm and greater with movements decreasing within 14 days of the release date. Shocking at the upper release site allowed us to recapture one of the radio tagged fish and showed it to be healthy and sutures healing properly. That in mind, the reduction in temperatures during October should elicit spawning migrations in a portion of the marked fish. Tagging was performed to determine if we are sampling a transient population in September or one that is moving through to spawning locations higher up in the drainage.

Late August, we performed a mark and recapture study on the upper Hemlock Bar reach (262-265 rkm) to obtain a population estimate on rainbow trout and mountain whitefish. The results for the 3 rkm section showed mountain whitefish to be around 7,501 (95% C.I. 5,603-10,281) and rainbow trout numbers of 386 (95% C.I. 192-695). These estimates are similar to the estimates in 1994 and 1999. Partridge (1983) showed mountain whitefish numbers of approx. 15,000 in the same river section in 1980. September.

In September, we sampled our six biomonitoring sites with electrofishing gear

(Figure 1). The six sites sampled included a new site added as a reference site in Wardner, BC, which is above the influence of the reservoir. Preliminary estimates showed less fish at the two upper sites and is presumably due to flows being elevated 3-6 kcfs than in previous shocking years. In the Wardner reference reach, even though visibility was poor, there was a noticeable increase (2-3 fold) in catch per effort. The sample sites in the upper sections of the river were dominated by mountain whitefish (*Prosopium williamsoni*), while the lower sites showed more northern pikeminnow (*Ptychocheilus oregonensis*), largescale sucker (*Catostomus macrocheilus*), peamouth chub (*Mylcheilus caurinus*), and redbreast shiners (*Richardsonius balteatus*).

This quarter, zooplankton sampling was performed each month and is in the process of being analyzed. Additionally, IDFG is assisted the KTOI in collecting nutrient samples as well as chlorophyll concentrations in the upper canyon section in order to facilitate collection efficiency.

Permitting is underway for the nutrient restoration efforts in the upper Kootenai River. NEPA work is being performed by the BPA, which includes public meetings scheduled for this following quarter.



Figure 1. Night electrofishing in September on the Kootenai River near Porthill, ID.

White sturgeon

Field activities performed during this quarter included larval sampling by drift nets and light traps, sonic and radio telemetry, gill netting, and adult sampling in Kootenay Lake.

Larval sampling during the period included light trap sampling, and D-ring and ½ meter nets fished at the surface, mid-channel, and on the bottom. Similar to 2003, the focus of the 2004 larval sampling included documenting any wild white sturgeon recruitment which may have occurred from the "Set and Jet" program or from any other area within the Kootenai River system. Most of the sampling occurred at Ambush Rock (rkm 244.5), but some sampling occurred at Shortys Island (rkm 230.0) and Fleming Creek (rkm 225.0). All of the larval sampling at Ambush Rock was conducted at night, when sturgeon larvae are thought to be drifting and more vulnerable to our sampling gear. Many non-target larval and juvenile fish were collected in the drift nets, but no white sturgeon were collected. Light traps were

developed in 2003 and tested in 2004 to determine their effectiveness as a larval white sturgeon monitoring and evaluation tool (Figure 2). Light traps were illuminated with 6-inch cyalume tubes which lasted 12 hours. Light traps were set in the evening and checked the following morning. We sampled 10 nights with an average of four light traps per night. Several hundred non-sturgeon larval and juvenile fish were collected at various locations throughout the Kootenai River. Most of the larvae came from the canyon reach above Bonners Ferry (above rkm 262). No larval white sturgeon were sampled. General (sonic and radio) telemetry was completed biweekly when white sturgeon were in the spawning reach and weekly thereafter. Aerial flights were conducted weekly through July, to find missing white sturgeon and to document movements and habitat use in the lower Kootenai River in BC. Most of the transmittered white sturgeon had returned to Kootenay Lake or to

lower portions of the Kootenai River by the end of this quarter.

Gillnetting was conducted to determine density, distribution, and length-frequency and age distribution of hatchery reared and wild juvenile white sturgeon in the Kootenai River. Gillnetting began in July and continued into September. Two-hundred juvenile white sturgeon were sampled during the quarter, but only three wild juveniles were collected.

In conjunction with the Kootenai Tribe of Idaho (Sue Ireland) and the British Columbia Ministry of Water, Land, and Air Protection (Matt Neufeld), an array of 26 VEMCO receivers (passive sonic telemetry) were placed in the Kootenai River from Ambush Rock (rkm 244.4) to the Kootenai River delta (rkm 118) during summer 2003 and 2004 (Figure 3). During the 2004 gillnetting operations, 14 hatchery-reared

juvenile white sturgeon of various age classes were implanted with VEMCO sonic transmitters to determine dispersal from stocking locations, movement patterns, and habitat selection.

With the help of the British Columbia Ministry of Water, Land, and Air Protection, we implanted eight adult white sturgeon with VEMCO transmitters by angling on the Kootenai River delta (rkm 120). These eight individuals were of various sizes and sexual stages and we hope to determine any additional pre-staging areas in the lower Kootenai River, and any specific movement patterns between the Kootenai River delta in British Columbia and the Kootenai River in Idaho. Figure 4 shows an example of one adult male white sturgeon's movement pattern from the Kootenai River delta into Idaho and back, and illustrates the capabilities of this new passive sonic telemetry technology.



Figure 2. Light trap used to sample larval white sturgeon, Kootenai River, Idaho, 2004.

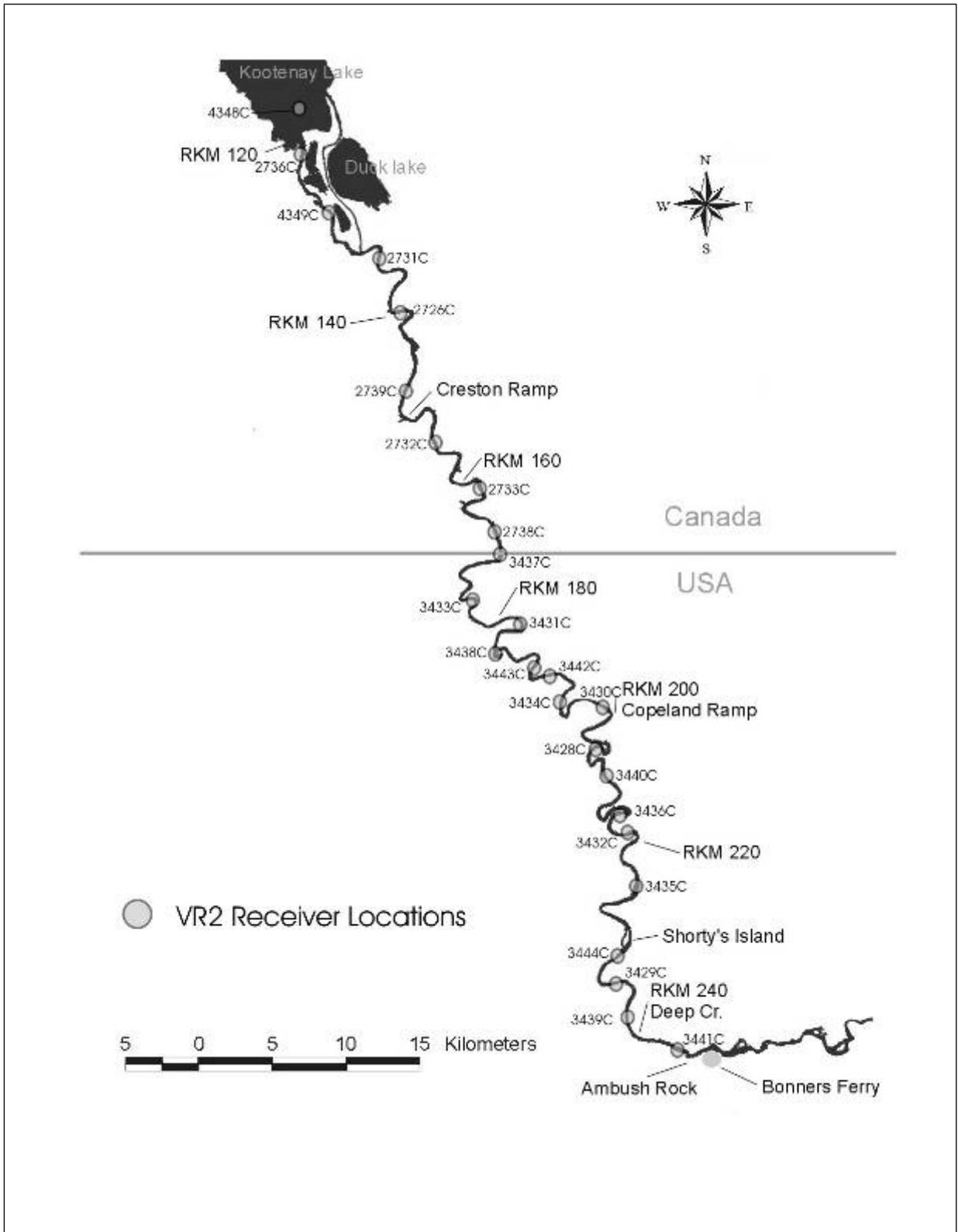


Figure 3. Locations of Vemco VR2 receivers (by serial number) within Idaho and British Columbia, Kootenai River, Idaho, 2004.

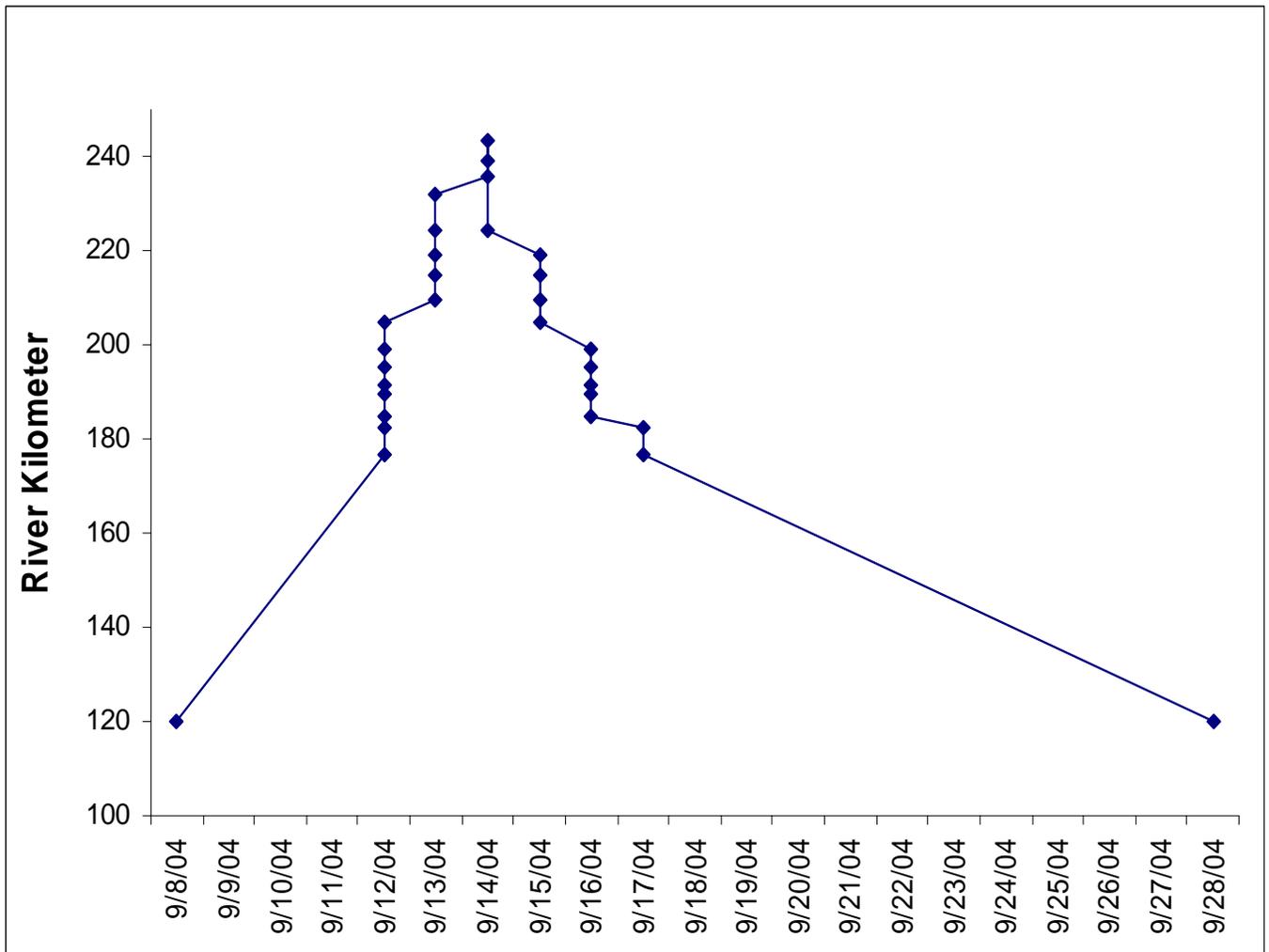


Figure 4. Movement history of a sexually mature male white sturgeon captured September 8, 2004 at the Kootenai River Delta, British Columbia, Canada, and implanted with VEMCO sonic transmitter. RKM 120 is Kootenay Lake, BC.

Rainbow and Bull Trout

Water nutrient samples were collected once/month from Boulder Creek in June, July, August, and September. A summary of water nutrient data collected from Boulder Creek in 2003 indicates this stream is nitrogen limited (Table 1). Electrofishing was conducted in September to determine the rainbow trout

population structure. This data has not been analyzed yet. Bull trout redd surveys were initiated in late September and will continue in October. A manuscript summarizing sources of rainbow trout recruitment to the Kootenai River, Idaho was submitted to Northwest Science, and the 2003 Annual Report was started.

Table 1. Nutrient concentrations for Boulder Creek, June through September 2003 (“Gauging station” is the U. S. Forest Service gauging station near Boulder City).

Date	Site	Total phosphorus (mg/l)	Total Dissolved phosphorus (mg/l)	Soluble reactive phosphorus (mg/l)	Ammonia (mg/l)	Nitrates + nitrites (mg/l)	Total nitrogen (mg/l)	Total organic carbon (mg/l)
6/17	0.5 km from mouth	0.005	0.002	0.001	0.007	0.010	<0.050	1.180
6/17	0.5 km from mouth	0.002	<0.002	0.002	0.009	<0.010	<0.050	1.330
6/17	Gauging station	0.002	0.004	0.001	0.008	<0.010	<0.050	1.380
6/17	Gauging station	0.004	0.004	0.001	0.010	<0.010	<0.050	1.200
7/21	0.5 km from mouth	0.003	<0.002	0.001	0.014	0.013	0.054	1.010
7/21	0.5 km from mouth	<0.002	0.002	<0.001	0.008	0.011	0.073	1.280
7/21	Gauging station	0.002	0.002	<0.001	0.007	0.015	0.086	1.230
7/21	Gauging station	<0.002	<0.002	<0.001	0.008	0.013	0.071	1.040
8/20	0.5 km from mouth	<0.002	<0.002	<0.001	<0.005	<0.010	<0.050	1.070
8/20	0.5 km from mouth	<0.002	<0.002	<0.001	<0.005	<0.010	<0.050	0.933
8/20	Gauging station	0.002	0.002	<0.001	<0.005	<0.010	<0.050	1.250
8/20	Gauging station	<0.002	<0.002	<0.001	<0.005	<0.010	<0.050	1.070
9/23	0.5 km from mouth	0.002	0.003	0.002	0.010	0.015	<0.050	0.983
9/23	0.5 km from mouth	0.003	0.002	0.001	0.012	0.014	<0.050	0.721
9/23	Gauging station	0.003	0.002	<0.001	<0.010	<0.010	<0.050	1.170
9/23	Gauging station	0.002	0.002	<0.001	<0.010	<0.010	<0.050	0.799

Meetings Held/Attended, Communication, and Accomplishments for the Quarter:

- Pete wrote a news release concerning Kootenai River white sturgeon studies.
- Pete attended a Kootenai River Recovery Team meeting and gave project updates.
- Pete attended IKERT meeting in Bonners Ferry.
- Jody, Ryan, and Vaughn participated in an IKERT and Adaptive Ecosystem Methodology meeting in July for Kootenai River investigations
- Jody met with Mike Gondek and a reporter from the Bonners Ferry Herald to discuss bank erosion structures and fish habitat on Trail Creek.
- Vaughn and Jody worked on revision for the Kootenai River Subbasin Plans
- Vaughn had a presentation in a sturgeon symposium at the Annual AFS meeting in July
- Vaughn attended one Kootenai River white sturgeon recovery team meeting
- Vaughn had a coordination meeting with William Swink USGS Hammond Bay Michigan and Mark Ebner of the Chippewa/Ottawa Tribe pertaining to a burbot temperature and reproductive fitness lab study in association with Molly Webb of Oregon State University
- Vaughn attended a BPA workshop
- Vaughn had a Kootenai River fisheries and habitat presentation for a U of I Fisheries Ecology class
- Vaughn reviewed a burbot MOU and Kootenai River Burbot Conservation Strategy

Next Quarter Activities and Meetings:

- Vaughn will attend a Fish Managers Meeting and a Principals Meeting in November
- Vaughn has a Kootenai River White Sturgeon Recovery Team Meeting in November
- Vaughn has a Kootenai River Burbot Recovery Team and KVRI Meeting in November
- Ryan and Charlie Holderman (KTOI) will be presenting to KVRI and the Kootenai Valley Sportsman's Club and will have a meeting with EPA, DEQ, and USFWS regarding nutrient restoration, meeting date as yet to be set
- All will be working on annual reports
- Ryan will be working on permitting documents for nutrient restoration
- Jody will be summarizing redd surveys and rainbow trout population statistics
- Pete will be Finalizing the 2003 annual report, preparing a summary of 2003 and 2004 Set and Jet Program, Data analysis of depth sensitive radio telemetry research 2002 and 2003, and download VEMCO receivers bimonthly.
- Vaughn will begin the Kootenai River and tributary burbot studies