

**Idaho Department of Fish and Game,
April – June, 2006**

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

White Sturgeon

Kootenai River white sturgeon monitoring and evaluation efforts during the spring period included adult sturgeon sampling, egg mat sampling, embryo releases, Vemco VRAP telemetry studies, and deploying and maintaining Vemco VR2 passive sonic telemetry receivers.

Adult sturgeon sampling began in February and continued into June. One hundred forty-five adult white sturgeon were collected with setlines and angling. Surgical procedures were performed on a sub-sample of the adults to determine sex and stage of maturity. Thirty of the white sturgeon sampled were females, 55 were males, and the rest were of unknown sex. Twenty-two of the 145 adults sampled were new fish, and not previously captured. With sexes combined, total length ranged from 110 to 247 cm and weight ranged from 8 to 83 kg.

Egg mat sampling began in May and continued into July. Mats were deployed from rkm 229.5 to 245.8. Between May 26 and June 9, 660 eggs were collected on 5 mats. One

individual mat at rkm 229.5 contained 589 eggs on May 26. This marks the most eggs ever collected on one individual egg mat and 2006 marks the most eggs ever collected in a year since sampling began in 1991. Most of the eggs were collected near Shorty's Island (rkm 229.5 - 231.5), but 1 egg was collected upstream at rkm 236.3 near the refuge.

In cooperation with the Kootenai Tribe of Idaho Hatchery personnel, we continued an experiment in 2006 to release fertilized eggs into the Kootenai River at selected sites. The purpose of this research is to try to determine the habitat criteria necessary for successful hatching of Kootenai River white sturgeon eggs at the field level. Fertilized eggs were released at five sites in 2006. Two of the same sites used in 2005 were used again in 2006; however three additional sites were selected in 2006. These areas included two side channels within the braided reach and one side channel below boulder creek in the Canyon reach (Table 1). Similar to 2005, selection criteria included rock

and gravel substrates with minimum water velocities of 1 m/s at 170 cms discharge calculated at Bonners Ferry. The side channel areas often met these flow criteria at higher discharges, but were mainly selected because they provided conditions more suitable for sampling. Mainstream larval sampling under the high flow conditions of 2006 was not feasible (Figure 1). Between June 4 and June 28, 8 releases were made for a total of 563,480 eggs at 5 sites. Thirteen potential families were created and a representation of each family was stored at the Kootenai Tribe of Idaho Hatchery Facility to document fertilization and hatching success and to provide a benchmark for when to expect hatching in the river. To date, no white sturgeon embryos or larvae have been collected.

Beginning in April, a Vemco V-RAP acoustic telemetry system was deployed near Shorty's Island (rkm 230.8) through a subcontract with USGS (BRD, Cook, Washington). This technology involves 3 stationary buoys that independently record acoustic signals from previously transmitted adult white sturgeon that enter the buoy array. Geographic positions are determined through triangulation and data are sent through radio waves back to a base station receiver and individual fish positions are displayed on a computer at the Bonners Ferry field station. The purpose of this research is to determine pre-construction habitat use of a specific reach of the Kootenai River at Shorty's Island by spawning adult white sturgeon. Beginning in late July 2006, large rock will be placed on the substrate near this area (rkm 230.8) as a pilot study to determine how physical hydrologic processes affect these structures and potentially, how changing

physical habitat affects white sturgeon behavior. This area is a known spawning area.

Twenty adult white sturgeon were tagged with Vemco ultrasonic transmitters during the period and their movements will be monitored for the next several years. To date, 50 adult white sturgeon have been implanted with Vemco sonic transmitters and all transmitters should still be active. Beginning in 2003 and continuing into 2006, an array of passive Vemco sonic telemetry receivers was deployed from Kootenay Lake, British Columbia upstream into Idaho near the Montana border (Figure 2). This array allows for efficient, cost-effective monitoring of sturgeon movements throughout the Kootenai system and will aid in our understanding of seasonal movement patterns and seasonal responses of sturgeon to changes in flow conditions and temperatures. In 2006, additional sonic receivers were deployed in the braided reach above Bonners Ferry to further document any movements into this reach. This area is composed of gravel and cobble substrates which may provide improved spawning and rearing conditions for young sturgeon. Three transmitted adult white sturgeon were detected on receivers above Bonners Ferry in June, 2006. This marks the first time any transmitted adult white sturgeon had been documented moving above Bonners Ferry. Discharge and temperature of the Kootenai River will be discussed next quarter but The Kootenai River crested 0.7 m above flood stage and reached about 1,870 m³/s, the highest recorded discharge and river stage since Libby Dam was constructed

Table 1. Egg release site specifications and water quality parameters from egg release experiment, Kootenai River, Idaho, 2006.

Site Name	River kilometer	Date	Eggs released	Release number	Mean velocity (m/s)	Water Temp C°	Leonia Discharge (cfs)
Crossport ^a	255.7	4 - Jun	87,000	1	0.9	9.0	32,750
Cow Creek ^a	250.8	7 - Jun	48,675	2	1.0	11.0	31,050
		10 - Jun	63,825	3	0.9	11.0	48,000
		13 - Jun	122,100	4	1.1	14.0	45,000
Hemlock bar	262.5	26 - Jun	80,000	5	1.3	14.0	35,000
Caboose Creek*	270.2	27 - Jun	55,500	6	0.8	11.0	26,000
		28 - Jun	47,690	8	0.9	14.0	26,500
Boulder Creek		27 - Jun	58,690	7	1.8	14.0	26,000
Total			563,480				

^a Side channel



Figure 1. Kootenai River at the Deep Creek boat ramp, near river kilometer 240, June 2006. The Kootenai River crested 0.7 m above flood stage and reached about 1,870 m³/s, the highest recorded discharge and river stage since Libby Dam was completed.

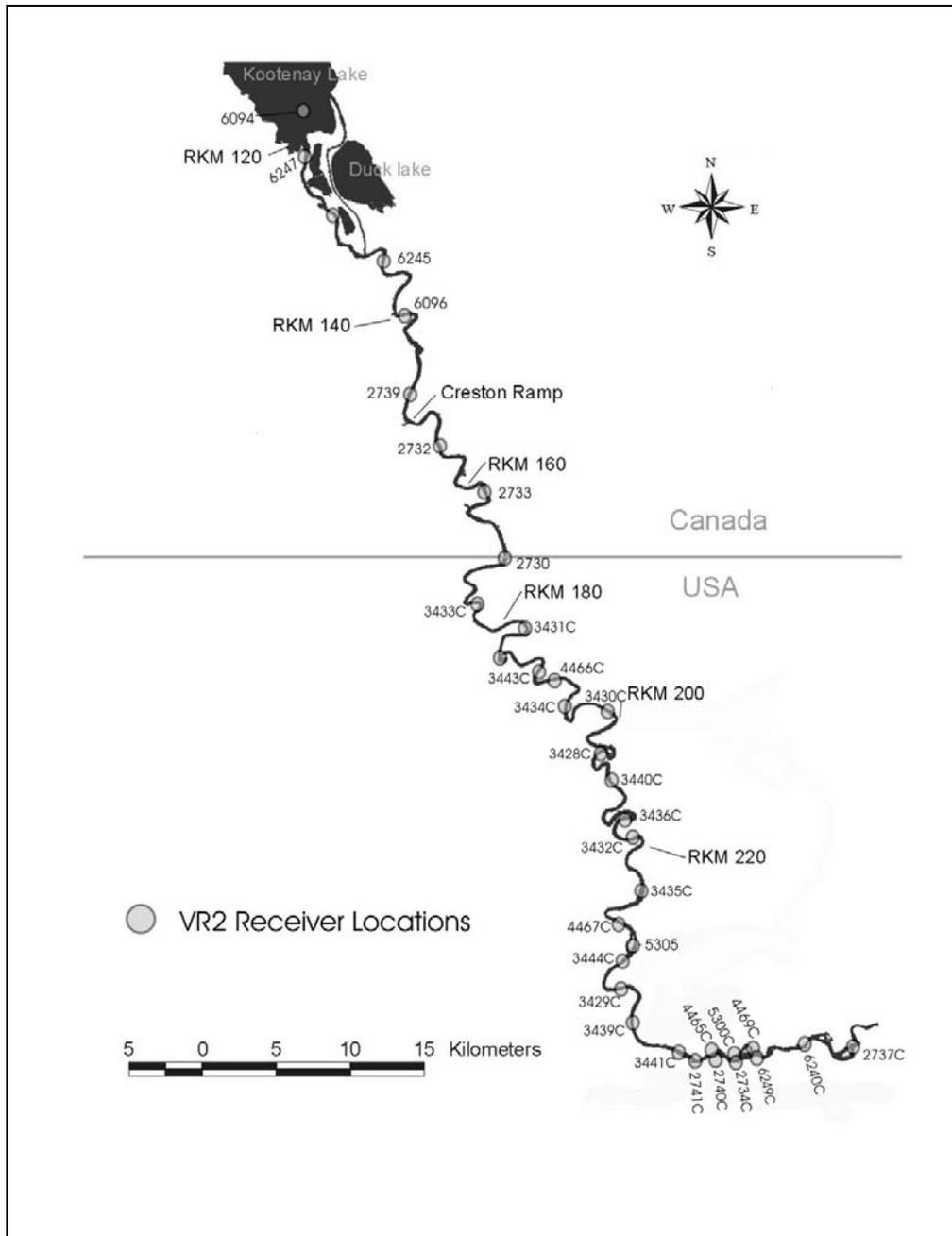


Figure 2. Locations of sonic receivers (Model VR2, Vemco brand) in Idaho and British Columbia, Kootenai River, 2006.

Burbot

Sampling for larval burbot with light traps and ½ m nets and telemetry were the only field activities for burbot this quarter. No larval burbot were collected.

The following is a summary for burbot telemetry for six of seven burbot for the 05-06 winter. Seven burbot were implanted with Vemco coded transmitter tags between October 2005 and March 2006. Three burbot were tagged near Nick's Island (rkm 144.5), two were tagged near the mouth of the Goat River (rkm 152.7) and two were tagged at Ambush Rock (rkm 244.5). Vemco VR2 single channel monitoring fixed location receivers were placed in Deep Creek, Smith Creek and Boundary Creek in Idaho, and in the Goat River and Summit Creek in Canada to determine burbot use of the tributary streams. Vemco receivers in the Kootenai River were also monitored for burbot movement.

Burbot 338 tagged on January 13, 2006 at rkm 244.5 had very limited movement remaining within one kilometer of the tagging site until the last contact on March 18, 2006.

Burbot 341 tagged on March 2, 2006 at rkm 244.5 moved upstream and downstream remaining within three kilometers of the tagging site until last contact on May 15, 2006.

Burbot 339 tagged on February 8, 2006 at rkm 152.7 moved into the Goat River on February 15, 2006 then moved back into the Kootenai River on

February 21, 2006. He then moved downstream and briefly entered Summit Creek, re-entered the Kootenai River and continued downstream to the point of last contact February 22, 2006 at rkm 122.5 near Kootenai Lake on (Figure 3).

Burbot 327 tagged on December 21, 2005 at rkm 144.5 was detected at rkm 140.5 on December 28, 2005. It was detected by the Summit Creek Vemco receiver on February 26, 2006 and again at the time of last contact on March 5, 2006.

Burbot 335 tagged on December 12, 2005 at rkm 144.5 made a steady downstream movement between the tagging site and the last contact on December 28, 2005 at rkm 122.5.

Burbot 340 tagged on February 8, 2006 at rkm 152.7 was recorded on the Goat River Vemco receiver on February 24, 25, and 28, 2006 and again at the time of last contact on March 23, 2006. It was not detected in the Kootenai River.

Although our VR2 receivers will be downloaded several more times with burbot locations this recent information has been noteworthy; prior to 2006 we have never detected a telemetered burbot in Summit Creek and the movement of burbot from the Goat River to Summit Creek or any other tributary had not been documented. Furthermore we have not documented a burbot in the Goat River for the past four seasons until now.

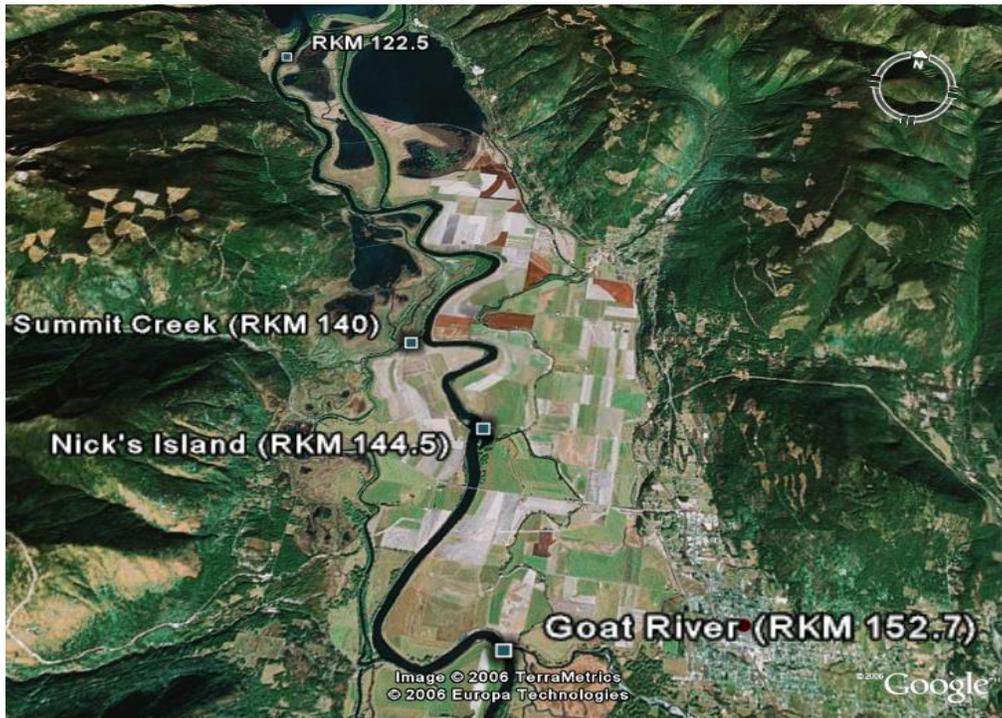
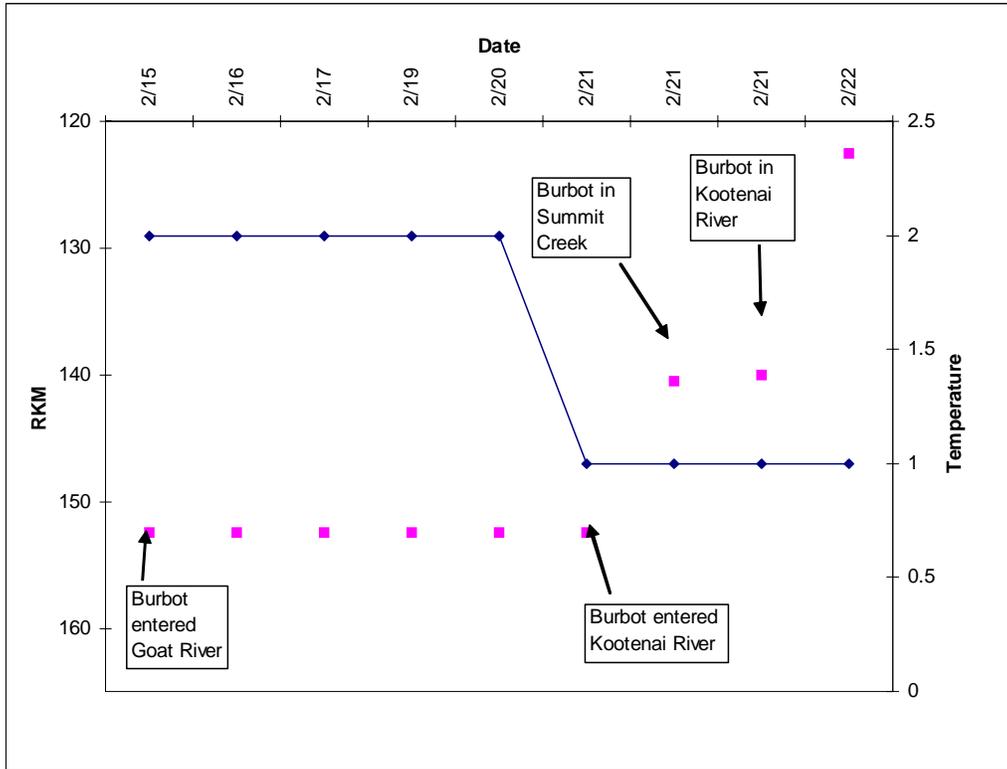


Figure 3. Burbot 339 tagged on February 8, 2006 at rkm 152.7. Upper panel is movement locations and daily mean Kootenai River temperature while the lower panel is a Google photographic image of the Kootenai River Basin in British Columbia showing locations of burbot 339.

Rainbow and Bull Trout

A stream sampling design protocol was set up for Kootenai River drainage streams in Idaho. Sample sites were randomly chosen, but also spatially dispersed throughout the drainage, following the U. S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP) sample site selection protocol.

Sampling of streams began in May, but full implementation of sampling will not be possible until July when heavy runoff in the streams begins to subside. Approximately 20 streams were sampled in May and June. Work continued on Data analysis and the 2005 annual report.

Nutrient restoration

The final permit (NPDES) for the nutrient additions from the EPA was issued in June, 2006. This permit allows the discharge of phosphorous at 53 million:1 ratio (Kootenai River flow: TDP). This dilution rate was set in order to keep the additions within the EPA eco-regional guidelines of 7.7 ug/L of TP.

This quarter, we had our 8th annual International Kootenai River Ecosystem Restoration Team meeting held at the Kootenai River Inn May 25th and 26th. Items discussed were nutrient concentration, dosing rate, permit requirements, and Kootenai River summer flow. Based on last year's algal growth response, it was decided that we

will add liquid phosphorous at 3 ug/L TDP. This dilution rate will give us 69 million: 1 ratio water to TDP ratio falling well within the current EPA guidelines of 53 million:1 monthly average.

Liquid P was delivered on June 20 to the application site. Nutrient additions will begin July 11, 2006 at a dosing rate of approx. 0.45L/min. No nitrogen will be added until ambient nitrogen levels drop to 30-50ug/L in the river. Current ambient DIN levels are around 80 ug/L.

This quarter will be taken up with field sampling of primary and tertiary productivity in the river. Fish sampling through electro-shocking will take place the first part of September, 2006.

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

- Ryan has had many phone meetings with Charlie Holderman of KTOI to coordinate his project
- Vaughn has been trying to get BPA to use the right name of the Kootenai River Fisheries Program – he had it changed to Kootenai River Fisheries Recovery Investigations 11 years ago and somehow it has been reverted back to Kootenai River White Sturgeon Recovery
- Pete and Vaughn listened in on several KRWSRT conference calls

- Jody attended a Mountain Columbia Province Review Team meeting at the Kootenai Tribe of Idaho headquarters in Bonners Ferry. This meeting was to discuss recommendations of funding priorities for 2007-2009 project proposals
- Jody taught fish ecology and anatomy to two preschool classes
- Jody attended the International Kootenai River Ecosystem Recovery Team meeting in Bonners Ferry, May 25-26
- Jody gave a presentation to a hunter education class in Post Falls
- Vaughn attended two Mountain Columbia Province Review Team meetings in Kalispell Montana and contributed to several conference calls. These meetings were also to discuss recommendations of funding priorities for 2007-2009 project proposals
- Vaughn had oral presentations to KVRI and the Post Falls Rotary
- Vaughn had one telephone news interview
- Ryan managed an IKERT meeting with Charlie Holderman of KTOI, it was held at Kootenai River Inn; May 25-26, 2006
- Ryan secured the NPDES Permit received June 2006

Next Quarter Activities and Meetings:

White sturgeon

- Continue sampling for larval white sturgeon with D-ring and ½ meter plankton nets and seines, gill netting
- Adult capture and tagging at the Kootenai River delta in British Columbia
- Downloading and maintaining Vemco receivers
- Rock placement Pilot Study at Shorty's Island
- Send 2005 annual report out for review and begin 2006 annual report
- Vaughn will attend the Annual AFS meeting and present recent findings of spawning locations and USGS bathymetry work

Burbot

- Continue on the '05 – '06 annual report
- Down load VR2 receivers

Ecosystem Rehabilitation

- Conference call with IKERT subcommittee to summer sampling and fall reporting
- Nutrient additions to start July 11, 2006 and ending the end of September

Rainbow and Bull trout

- Electrofish Kootenai drainage streams to estimate trout densities and distribution of other fish species
- Continue analyzing and summarizing 2005 data
- Continue writing the 2005 annual report

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Sue Ireland (KTOI)
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Brian Marotz (MFWP, Kalispell)
Jeff Laufle & Greg Hoffman (USACE)
Bob Hallock (USFWS)
Virgil Moore, Dan Schill, Steve Yundt, Ned Horner, Chip Corsi, Greg Johnson,
Fred Partridge (IDFG) Gary Barton (USGS), Boundary County Commissioners