Idaho Department of Fish and Game
July - September 2006

Kootenai River Fisheries Recovery Investigations

Quarterly Progress Report and Summary of Activities

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Field Work Completed or in Progress and Summary of Results

Rainbow and Bull Trout

Electrofishing and snorkel sampling continued in order to estimate salmonid abundance and distribution in Kootenai River drainage streams. Snorkel sampling had to be incorporated into the protocol after we discovered that conductivity levels in most streams were too low for effective electrofishing depletion estimates. Approximately 75 sites were sampled from July through September. At seven sites, trout were marked and released back to the stream, then snorkeled the following day to estimate sampling efficiency by snorkeling.

Analysis of 2005 data continued, including the creel survey data and the westslope cutthroat trout genetics data. Progress was made on the 2005 annual report with a first draft expected by early November. Several nights of electrofishing were conducted on the Kootenai River in September to determine rainbow trout population structure and condition factors, and to collect scales and otoliths for aging.

Burbot

On July 6th Vaughn Paragamian and Matt Neufeld of the British Columbia Ministry of Environment took a tour of four tentative rearing ponds for extensive burbot culture. All were in Boundary County. There were eight main features that they looked for: location, water source, water depth, boat access, shoreline access, no drainage outlet, fish community, temperature and perceived risk of Summer or Winter Kill. Of four lakes/ponds visited, Sinclair Lake appears to be the best candidate for larval rearing trials (Figure 1). Sinclair Lake has the best access for sampling crews. The lake has a permanent dock and developed boat launch. Weed development along shorelines, although present, did not completely obscure the bottom in any location, did not extend far from shore and was not dense enough to inhibit

sampling for juvenile burbot. Based on weed development (or lack thereof) the depth appears to be greater than any of the other ponds visited. Although no fish were seen there is a possibility that perch and pumpkinseed are present in the lake as well as stocked rainbow trout, the presence of perch and pumpkinseed was also possible in all the other ponds visited. More intensive sampling would have to be conducted to screen all locations by fish species present. Although the water temperature was quite warm, it was the lowest of the ponds that we obtained samples from. The temperature recorded (24^{o}C), although relatively high compared to what is typically observed in burbot rearing sites, was in the range often observed in juvenile burbot habitat on Columbia Lake where wild juvenile burbot are frequently captured (Taylor 2002; Juvenile Burbot Sampling in Columbia and Windermere Lakes, 2002). The lake appears to be "closed" with no developed outlet. Because this lake has no outlet and is on State owned land, it is possible that if environmental concerns were met and the need arose, that burbot progeny could be removed from the lake using Rotenone or other fish eradication techniques. As well, from a management level perspective, the lake is in the Moyie drainage and rearing larvae from the same drainage (i.e. Moyie Lake) may present fewer disease transfer and escapement concerns from management agencies than two of the other ponds which were connected to the Kootenai River directly in high water years.

Burbot studies in the Kootenai River will not resume until November of 2006.

Figure 1. Sinclair Lake is in the Moyie River drainage of the Kootenai River, Idaho. But it has no outlet.

Nutrient restoration

Last quarter, the very last permit required for nutrient additions to the Kootenai River was obtained from the EPA (NPDES) to allow 2006 nutrient additions to the river to begin. The first week of July, 5,400 gallons of Phosphate (10-34-0) along with 2,100 gallons of water (for site cleanup and dilution) were delivered to the injection site.

Nutrient additions to the Kootenai River began July 12, 2006 at the rate of 0.43L/min at a river flow of 18,085 cfs. At this concentration, additions were to achieve 3.0 ug/L of Total Dissolved Phosphate (TDP). Nitrate was not added due to adequate levels of nitrate at the beginning of the experiment.

As in the 2005 season, within only weeks after the application began, extremely good algal growth was apparent on substrates lining the banks of the canyon reach above Bonners Ferry (Figure 2).

Throughout the application period, algal growth was visible in locations previously void of growth. Water samples taken throughout the summer indicated that orthophosphate levels were still extremely low (below detection limits) even within 1 rkm below the outlet pipe. This indicated that we had the proper amount of uptake by the surrounding biota with little to no surplus.

Although nitrate was on site in case ambient nitrogen levels dropped below 30ug/L, none was used throughout the season since ambient concentrations stayed on average above 100ug/L the entire growing season.

Phosphate additions stopped on September 30, 2006. Approximate amount of phosphate that was utilized through the season was 35,225 L (9,305 gallons) for the 80 day growing season.

Fall electrofishing for fish in the 6 biomonitoring locations on the river began August 24, 2006 (Figure 3). Catch and biomass estimates show that the site lowest in the river (KR2) had the highest Catch per unit of effort, whereas the highest biomass, as in previous years, continued to be in the un-impounded, un-treated part of the Kootenai near Wardner, B.C.. The high flows in the spring are thought to be the cause for large increase in numbers of fish in the lower reaches of the river.

Last season, 2005, algal production was on average 6 X greater than other PNW rivers. Our objective is to be10-12X greater in order to support an adequate macroinvertebrate production.

Figure 2). Algae growing on sampling tiles at rkm 265 (approx. 10 rkm below application site).

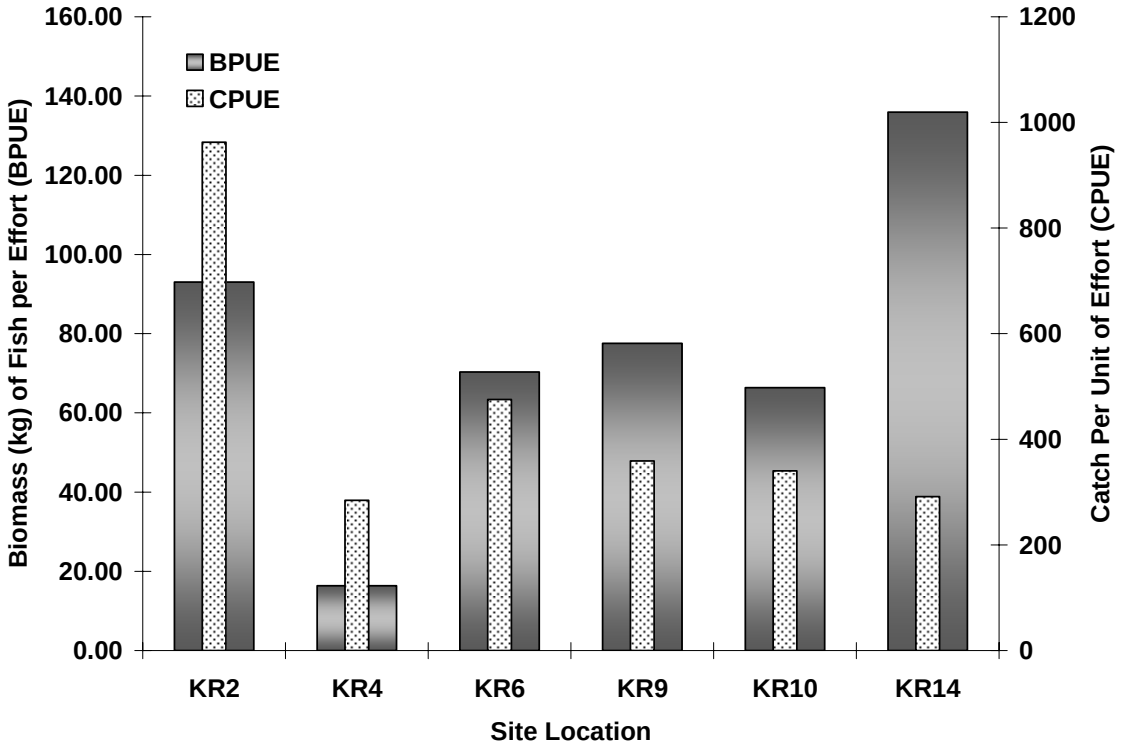

Figure 3. Results of fish biomass (kg) and catch per unit of effort from fall 2006 electrofishing of nutrient biomonitoring locations. These data will be used to determine the effects of fertilization on the game fish populations of the upper Kootenai.

White Sturgeon

Field activities performed during this quarter included larval sampling by D-ring and ½ meter nets, gill netting, adult sampling, and report writing and data analysis.

Larval sampling during the period included D-ring and ½ meter nets fished at the surface, mid-channel, and on the river bottom. Most of the sampling occurred upstream of Bonners Ferry below the embryo release sites to document any larval recruitment from the embryo release experiment. Most of the larval sampling occurred at night, when sturgeon larvae are thought to be drifting and more vulnerable to our sampling gear. Discharge at Leonia ranged from 570 m^3/s in early July to 280 m^3/s by the end of the quarter. With the record high (post dam) stage and discharge levels of 2006, sampling for post-hatch larval white sturgeon in mid-channel areas was difficult and dangerous. As a result, most of the eggs from the 2006 egg release study were released in side channel areas (Figure 4). Over 2000 non-target larval and juvenile fish were collected in the larval nets, but no white sturgeon larvae were collected in 2006.

Gillnetting was conducted at 10 sites 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 through September. About 190 hatchery reared and five wild juvenile white sturgeon were sampled during the quarter. Most of the juveniles were collected at Rock Creek. Catch rates increased as water levels decreased.

Adult sampling was conducted for 2 days in September and 1 female was implanted with a Vemco sonic transmitter. The purpose of this activity was to determine fall distribution and density of adult white sturgeon in the Kootenai River in Idaho and to implant Vemco transmitters into adults to study spring spawning movements.

The Shortys Island rock placement pilot study was initiated and completed during the quarter (Figure 6). The purpose of this pilot study is to test how the physical and hydrological processes of the Kootenai River affect this rock pile and secondary goals are to determine any biological response. Adult white sturgeon tagged in fall 2006 and in previous years will be used to address the degree of use of this newly created structure. Information learned from this pilot study will be used to develop large-scale USACE 1135 habitat projects that may improve spawning and rearing conditions for white sturgeon.

Figure 4. Larval sampling conditions at side channel (rkm 270), Kootenai River, Idaho, 2006.

Figure 6. Construction phase of Shorty's Island Pilot Study (rkm 230), Kootenai River, Idaho, 2006.

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

- Pete and Vaughn participated in the Kootenai River White Sturgeon Recovery Team (KRWSRT) conference calls and meeting and gave program updates and Vaughn discussed revising recovery criteria.
- Pete assisted Region 1 management biologists with bull trout redd counts in the Priest river drainage.
- Vaughn and Pete have been working closely with the PRP habitat enhancement project for white sturgeon spawning
- Vaughn and Diane prepared a telemetry ms. for consideration for the Proceedings of the Second International Burbot Symposium
- Jody attended bull trout redd count training on Trestle Creek.
- Jody helped Steve Elle and Liz Mamer (IDFG-Nampa) collect mountain whitefish from the Kootenai River as part of a statewide mountain whitefish life-history study.
- Ryan met with Charlie Holderman of KTOI met again with Peter Ward the Canadian engineering contractor assisting with nutrient restoration
- Ryan had frequent meetings with BPA, KTOI, and the public for the ecosystem project needs.
- Ryan is finishing up on data analysis and annual reports for the next IKERT meeting to be held in May, 2007.
- Pete presented project highlights at KRWSRT meetings.
- Pete assisted USGS with larval trawling in Bonneville Pool on Columbia River.
- Pete assisted Region 1 management biologists with bull trout redd counts in the Priest River and Pack river drainages.

Next Quarter Activities and Meetings:

White sturgeon

- Finalize 2005 annual report and send 2006 report out for review.
- Analyze data analysis and prepare manuscripts for publication.
- Present data to KRRT and other groups.
- Prepare 2006 work plan.
- Participate in Braided Reach habitat team meetings and events.
- Tag additional female white sturgeon for spring 2007 movement studies

Rainbow and Bull Trout

- Complete bull trout redd surveys on Boulder and North and South Callahan creeks.
- Begin entering the 2006 stream survey data.
- Enter Kootenai River electrofishing data.
- Begin aging rainbow trout scales and otoliths.
- Complete a draft of the 2005 annual report.

Burbot

- Continue coordinating with the BC Ministry of Environment, Kootenai Tribe of Idaho, University of Idaho and IDFG Fisheries Bureau regarding donor stock burbot and DNA extensive culture
- Begin hoopnet sampling in November for burbot
- Work with the KVRI Burbot Committee on an SOR

Ecosystem Rehabilitation

- Hold nutrient sub-committee meeting on post-fertilization efforts and upcoming season needs.
- Finish manuscript on burbot and zooplankton interdependence.
- Finish the 2005-2006 annual report and start on the 06-07.

Cc. Lee Watts & Scott Bettin (BPA)
Sue Ireland (KTOI)
Colin Spence (BC Fisheries)
Brian Marotz (MFWP, Kalispell)
Gary Barton (USGS)

Jeff Laufle & Greg Hoffman (USACE)

Steve Duke, Bob Hallock (USFWS)
Virgil Moore, Steve Yundt, Ned Horner, Chip Corsi, Greg Johnson, Fred Partridge, (IDFG)

Boundary County Commissioners