

Transboundary Flathead Research Needs Workshop
West Glacier, Glacier National Park, MT
November 3rd, 2005

EXECUTIVE SUMMARY

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On November 3rd, 2005, thirty-three scientists and resource managers from Montana, British Columbia and Alberta, met in West Glacier, MT to discuss research needs in the Transboundary Flathead watershed. Specifically, participants were asked to determine priorities for:

- a. Baseline data collection
- b. Species and population inventories
- c. Long-term monitoring
- d. Cumulative effects analysis

In addition to these four categories, participants discussed these data needs in the context of potential land uses for the B.C. and Montana portions of the watershed, such as approval of coal mines, coalbed methane development, park protection, private land zoning and management of shared large carnivore and fish populations. The importance of baseline data and long-term monitoring were emphasized to ensure that existing conditions are accurately measured, in order to assess the impacts of potential land uses and to design appropriate regulations. The following is a summary of conclusions. Please see the attached addendum for a list of research projects developed following the workshop recommendations, as of January 2006.

The Transboundary Flathead River originates in southeast British Columbia and drains 4118 km² (1617mi²) of land between the MacDonald-Whitefish and Clark-Livingstone ranges of British Columbia and Montana. Approximately 40% of the basin is in British Columbia and 60% is in Montana, where it is known as the North Fork of the Flathead River. In Montana, the North Fork of the Flathead River forms the western boundary of Waterton-Glacier International Peace Park, a designated UNESCO International Biosphere Reserve and World Heritage Site. In addition, the North Fork in the U.S. is protected under the federal Wild and Scenic River classification. Finally, the watershed contains eight “blue-listed” aquatic and terrestrial species in British Columbia and seven species listed as endangered or threatened under the U.S. Endangered Species Act.

The Transboundary Flathead has a history of cross-border management issues, dating back several decades. In 1985, acting on parallel requests from the governments of the United States and Canada, the International Joint Commission (IJC) initiated an assessment of the impacts of the proposed Cabin Creek coal mine on transboundary water quality and quantity and migratory fish populations. Following nearly three years of extensive review by a bi-national panel of scientists, the six members of the IJC unanimously recommended against proceeding with the mine development, in recognition of the international ecological significance of the Transboundary Flathead watershed, citing specifically the potential detrimental impacts to the transboundary bull trout population.

In their reports and conclusion, the IJC explicitly raised the issue of the lack of sufficient baseline and long-term data to accurately assess the impacts of the proposed coal mine. Specifically, the Commissioners wrote, “The data deficiencies of major concern include those describing ground water, sediment, nitrite and ammonia, nutrients, and various components of biota, including fish.”

(FRISB, 1988). The data deficiencies identified by the IJC in 1988 served as a starting point for the workshop.

Conclusions from the West Glacier workshop fall under two broad categories, aquatic and terrestrial. With respect to terrestrial research needs in the Flathead basin, participants agreed that the Transboundary Flathead has one of the most outstanding large mammal assemblages in North America, including 16 carnivore and six ungulate species. This high diversity is attributed to a low human population, isolation of the basin, exceptional biodiversity of the landscape and habitat, functional connectivity, absence of industrial development and an intact floodplain ecosystem.

John Weaver laid the groundwork for carnivore studies in the Transboundary Flathead, documenting a unique community of carnivores that appears “unmatched in North America for its variety, completeness, use of valley bottomlands, and density of species that are rare elsewhere” and arguably is the “single most important basin for carnivores in the Rocky Mountains” (Weaver, 2001).

In 2003, an independent inventory of species at risk, critical habitats and endangered ecosystems was conducted for the area overlain by the Dominion Coal Blocks (DCB), which includes the upper headwaters of the Transboundary Flathead in British Columbia. The report confirmed occurrences of species at risk in the DCB, such as bull trout, fisher, grizzly bear, wolverine and Rocky Mountain bighorn sheep. Despite these confirmed occurrences, very little inventory or comprehensive habitat research has been conducted. Specifically, the report states that, “No specific botanical surveys appear to have been conducted on the DCB, nor have there been any systematic studies of birds, mammals, amphibians, reptiles or insects” (Demarchi and Hartwig, 2003).

Workshop participants used this report and others to determine information gaps and terrestrial research needs for the Transboundary Flathead. The research, monitoring and information priorities for the terrestrial component of the Transboundary Flathead are summarized as follows:

- Grizzly bear: Apply the U.S. cumulative effects model (CEM) to the Canadian portion of the watershed, with particular emphasis on floodplain habitat selection.
- Meso-carnivores: Conduct presence-absence inventories, demographic information and population trend analysis for wolverines, lynx, fisher, badger and river otters.
- Birds: Conduct territorial counts, productivity surveys and egg shell sampling for the pileated woodpecker, water ouzel and Harlequin ducks.
- Tailed frog: Coordinate research throughout the basin and continue monitoring to increase knowledge base of this species
- Whitebark pine: Expand and integrate surveys across international border.
- Riparian habitat classification: Map distribution of cottonwood galleries, deciduous trees, small mammals and beetles in the floodplain and tributaries.
- Current human impacts: Survey road use and traffic counts, user and resident attitudes, and recreational user days and trends.

With respect to aquatic research needs in the Flathead basin, resource managers and scientists determined that there are two primary types of data and information needs with respect to the Transboundary Flathead watershed:

- 1) Site-specific impact assessment data needed to evaluate the potential impacts of current coal mining proposals and additional resource extraction scenarios; and
- 2) Comprehensive basin-wide, long-term monitoring and assessment.

Participants referenced existing documentation of data needs found in the 2004 report by Summit Environmental Consultants Ltd., which conducted an extensive data search for the British Columbia government in the B.C. portion of the Flathead basin. The report states that, “There is little data from low-order streams that could be considered for the discharge of de-watered coal beds. This is potentially a critical information gap and baseline water quality monitoring will very likely be needed for at least three years before CBG [coalbed gas] development.”

With respect to native fish populations, participants emphasized the importance of the Transboundary Flathead for bull trout, which are listed as a threatened species under the U.S. Endangered Species Act. Bull trout redd surveys in 2003 revealed that the Canadian portion of the drainage accounted for 54% of all redds in the entire North Fork Flathead River drainage. In addition, the 3-mile spawning reach immediately downstream from the proposed open-pit coal mine at Foisey Creek in B.C. accounted for 36% of all the redds counted in the drainage (Weaver, 2005). The BC portion of the drainage is also a regional stronghold for genetically pure westslope cutthroat populations (Muhlfeld, et al. 2005a,c), and both bull trout and westslope cutthroat trout use the entire drainage as critical spawning and rearing habitat (Fraley and Shepard, 1989; Deleray et al. 1999; Muhlfeld et al. 2005b).

The research, monitoring and information priorities for the aquatic component of the Transboundary Flathead are summarized as follows:

- Expand fixed station water quality monitoring:
 - Establish sites in the B.C. portion of the drainage, including tributaries and mainstem river
 - Increase frequency of monitoring at the border station
 - Increase the number of stations in the Montana portion of the drainage
 - Increase monitoring parameters
- Conduct a riparian corridor assessment: Conduct vegetation and aquatic habitat mapping based on river hydraulics
- Conduct a full-scale fish population abundance and distribution assessment:
 - Conduct a basin-wide assessment of fish species distribution and abundance
 - Expand the Montana bull trout studies (redd counts, size and age class structure) to B.C. portion of watershed
 - Expand the Montana westslope cutthroat genetics studies to B.C. portion of drainage
 - Expand the Montana bull trout and westslope cutthroat trout habitat monitoring program (McNeil coring and substrate composition)
 - Evaluate fish habitat and monitoring at various spatial scales
 - Assess habitat quality – sediment coring
 - Assess habitat quantity – habitat inventories

- Conduct basin-scale bioassessment (benthos and periphyton assemblages) and a quantitative physical habitat assessment via a survey design
- Conduct groundwater quality monitoring:
 - Assess coal seam water quality and quantity
 - Assess groundwater-surface water interactions
- Conduct amphibian monitoring
- Evaluate baseline metal levels in biota
- Conduct sediment monitoring for targeted habitat types, including monitoring during precipitation events and base flows

Participants concluded that the barriers to data access, a lack of appropriate and valid sampling plans/protocols, and the need to compile existing data in a geospatial database impede cohesive management of the Transboundary Flathead. These issues were initially identified by the IJC in 1988, which stated that, “The Board notes that in the past, data has been collected using a variety of methods, and as a result there is a loss of comparability of data. In the future, all data should be collected using appropriate standardized methods” (FRISB, 1988). Participants concluded that this recommendation has not been met.

Overall, critical information gaps were more highly evident in the British Columbia portion of the drainage for both the terrestrial and aquatic components of the Transboundary Flathead. This is also the least impacted portion of the drainage with respect to human presence and associated industry, and the area currently targeted for fossil fuel development. The scientists agreed that these information gaps must be addressed prior to major land-use changes in the basin, and that at least three years of baseline data is needed to assess potential impacts to water quality and quantity, aquatic and terrestrial species, and the overall transboundary ecosystem.

In order to address the entirety of research needs for the Transboundary Flathead River, a basin-level assessment of the entire floodplain is the most comprehensive approach. An assessment at this level would both address the existing knowledge gaps, while at the same time furthering understanding of the processes that make the Transboundary Flathead such a unique, ecologically rich, international landscape.

Citations:

Deleray, M., L. Knotek, S. Rumsey, and T. Weaver. 1999. Flathead Lake and river fisheries status report. DJ Report No. F-78-R-1 through 5. Montana Fish, Wildlife & Parks, Kalispell.

Demarchi, R.A., Hartwig, C., and D. Phelps. 2003. Species at Risk Inventory Strategy for the Dominion Coal Block. Ecodomain Consulting.

Fraley, J. J. and B. B. Shepard. 1989. Life history, ecology and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and river system, Montana. Northwest Science 63:133-143.

Impacts of a Proposed Coal Mine in the Flathead River Basin, Board Supplementary Report. International Joint Commission, 1988.

Muhlfeld, C.C., S. Glutting, R. Hunt, D. Daniels, M. Boyer, J. Wachsmuth, and B. Marotz. 2005a. Hungry Horse Mitigation Program, 2004 Annual Progress Report: Investigations of the Flathead River Native Species Project. BPA Project Number 199101903.

Muhlfeld, Clint C., and Brian Marotz. 2005b. Seasonal movement and habitat use by sub-adult bull trout in the upper Flathead River system, Montana. *North American Journal of Fisheries Management* 25:797-810.

Muhlfeld, C.C., B. Marotz, S. Thorrold, and J. Fitzgerald. 2005c. Geochemical signatures in scales record stream of origin in westslope cutthroat trout. *Transactions of the American Fisheries Society* 134:945-959.

Summit Environmental Consultants, March 31, 2004. Summary of existing baseline water quality data. Prepared for the British Columbia Ministry of Energy and Mines.

Weaver, John.L. The Transboundary Flathead: A Critical Landscape for Carnivores in the Rocky Mountains. The Wildlife Conservation Society, Working Papers No. 18, July 2001.

Weaver, T.M. 2005. Forest-wide fisheries monitoring Flathead. 2005 Annual Progress Report. Montana Fish, Wildlife and Parks.

Addendum

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Planned Research Projects for the Transboundary Flathead Based on Workshop Recommendations

1. The University of Montana Flathead Lake Biological Station in collaboration with Glacier National Park
Site –specific impact assessment monitoring of coalbed water chemistry, stream chemistry, stream sediment and floodplain characterization in approximately 20 sites.
British Columbia portion of the drainage
Timeline: Beginning in 2006
Budget: ~ \$100k, first year
2. U.S. Geological Survey in collaboration with the National Park Service and the Flathead Lake Biological Station
Water quality assessment via enhanced gaging station and temporary fixed site monitoring from the international border south to the confluence with the Middle Fork. Linked to NPS and FLBS bioassessment via shared biological and habitat indicators.
U.S. portion of the drainage
Time line: 2007 – 2009
Budget: ~\$100k/year
3. National Park Service – Rocky Mountain Inventory and Monitoring Network
Emphasis on biological and habitat indicators (including hydrology) with inclusion of physiochemistry to classify sites and connect to fixed-site USGS monitoring.
U.S. portion of the drainage
Time line: 2006 and 2007 for status estimates; long term panel design thereafter
Budget: ~\$12-40k/year (Site costs are approximately \$2-3k/site, expect up to 20 sites/year in US portion of North Fork basin).
4. B.C. Wildlife
Grizzly bear monitoring, mountain pine beetle and DNA study. Linked to State of Montana grizzly bear monitoring and the NPS Intermountain Region International Conservation Program.
British Columbia portion of the drainage
Timeline: Not Available
Budget: Not Available

5. State of Montana, Fish, Wildlife and Parks
Continue Westslope cutthroat trout genetics project and bull trout redd surveys.
British Columbia portion of the drainage
Timeline: 2006-2009
Budget: ~ \$25k/year and \$8k in-kind

6. State of Montana, Fish, Wildlife and Parks in collaboration with the National
Parks Conservation Association, University of Montana and the Flathead Lake
Biological Station
Site –specific water chemistry analysis at 8-10 sites in Upper Flathead
British Columbia portion of the drainage
Timeline: 2006
Budget: ~ \$15k/year, \$10k in-kind from NPCA, \$2k in –kind from FWP