Interim Monitoring Working Group
Seventh Meeting - Nov 7, 2024 - Meeting Notes

Attendance

1. Evgeni Matveev, Communications Manager, *Elk River Alliance*
2. Keith Story, Environmental Impact Assessment Biologist, *BC ENV*
3. Matt Gay, Program Director for Water Strategy, *EVR* (left @ 1:34)
4. Nicolas Lapointe, Senior Conservation Biologist, *CWF*
5. Samantha Mertens, Ecosystem Biologist, *WLRS*
6. Stella Swanson, Board, *Elk River Alliance*
7. Abby Cousins, *North Coal* (joined @1:30pm)
8. Ashlee Jollymore, Consultant, *MacHydro*
9. Bill Annable, Professor, *University of Waterloo*
10. Jon Bisset, Owner, *Jon Bisset & Associates*
11. Kelly Munkittrick, Associate Professor, *University of Calgary* (had to leave @ 1:15pm)
12. Maggie Finkle-Aucoin, GIS & Database Manager, *LLC*
13. Mariah Arnold, Aquatic Program Director, *EVR* (left @ 1:34)
14. Stewart Rood, Professor of Environmental Science, *University of Lethbridge*
15. Mike Low, Treasurer, *CLEAR*
16. Fynley Kuijt, CBWM Coordinator, *Elk River Alliance*

Meeting outcomes

2025 Symposium planning	Consensus reached with overall symposium support. To keep MWG updated on progress, particularly around the symposium theme and decision-maker invitees. Action items - **Update MWG with event attendee list, including ministers, once compiled.** It's good Laurel Nash of the

	South East Initiative Secretariat has been contacted. - This event could really assist CLEAR, tying in the theme of drought and awareness. - Grasmere location could bring in lower watershed and Elko dam. **Suggest inviting BC Hydro.**

Data visualisation app	Consensus shows support for work to date with good first steps achieved. Current use case for the app is to be a data look up tool, and app use is fairly intuitive. Especially like the ability to view all data for each parameter from upstream to downstream. The value of the Collaborative is to have more eyes looking at the App as it develops further (e.g. benchmarks).
	
	Action items
	- Data missing from app
	  - **Need input from MOECCS, WLRS, and EVR.** Their knowledge of the past statistical analyses (including analyses reviewed by the Environmental Management Committee which oversees results of the Valley Wide EVR monitoring data), and their perspectives could give collaborative opportunities to look at the data we've assembled in the app and get better perspective of critical data gaps.
	  - **Call for anyone who knows of other missing data or good ways to upload data to let Evgeni know.**
	- Benchmarks to add to the app
	  - This will be a focus of the next MWG meeting. **Stella and Evgeni to confer with WG members (e.g. WLRS re cumulative effects benchmarks and MOECC re the upcoming revised ABMP)** and prepare materials on benchmarks prior to next MWG meeting.
	- Correcting data errors
	  - **Evgeni to set up a meeting with CWF data managers** regarding their system for retaining original sources of data and overlaying corrections.
	- Mainstem versus tributary sampling stations
	  - Establishing the actual location of stations which are labelled "Elk River". **Evgeni to contact Matt and Mariah about getting EVR's help with this.**
	- Sampling station location
	  - Consider adding longitudinal information on the "river km" from headwaters. **Evgeni to confer**

	further with Stewart - Adding notes re data quality - Annotate data set with an additional column with comments on quality (i.e. A, B, C (data grades or ice in hydrometrics). E.g. The Water Survey of Canada has a comments column. **Evgeni to look into adding an additional column.**

Data overview report	Consensus shows overall support for the data overview outline.
	
	Action items
	- Lack of fish population data consideration in Collaborative's work to date
	   - **Evgeni to include a section in the Report explaining the decision not to include fish population data at this time** (see Jon Bisset's and Bill Annable's comments and advice in the detailed notes). Ensure the rationale for the choice of fish habitat quality indicators (e.g. temperature and flow, invertebrate data) is presented in the report.
	- Community input on fish
	   - Evgeni, Stella and other MWG members (e.g. Jon, Bill) **plan for a round table discussion open to other stakeholders** (e.g. YQT, outfitters, Fish and Game clubs) on fish populations. See detailed notes for more details.
	- **Evgeni to provide further breakdown for each report section for review at next MWG meeting**

General action items	Bibliography and reading list - To create a shared resource for relevant literature where MWG can freely add information. Quarterly meeting schedule - First 2025 meeting poll to be distributed with meeting minutes - Ideally, meeting dates for next year to be set soon.

Meeting minutes

Collaborative updates	**[S. Swanson]** New Program Manager Caitlin Henneker, noted for her communication and scientific background. Steering Committee. Chair Update: Kat Hartwig replaced George

Greene as chair in accordance with the Charter, which stipulates rotating Chairs every 2 years. Grant Success: A $150,000 grant from REFBC was approved for projects supporting Ktunaxa Land and Water Uses, community-based water monitoring (CBWM), and program coordination. **[International Joint Commission (IJC) Elk Kootenay/i Study Board]** Stella Swanson and Kelly Munkittrick joined the Study Board. Study Board Directive from the Commission outlined. **[IJC - project goals]** Improving water quality understanding with Indigenous input and cross-border collaboration. First time a First Nations government is at the table with equal status to CAN/US governments. The aim is to have more timely action on water quality and transparent and accessible data sharing. Stella has already informed the Board of the Collaborative's work on data compilation and visualisation. **[IJC - timeline]** interim report due in September 2025, final report by September 2026. Production of a "Study Plan" is the first key milestone – due in late January. The Study Plan will outline how the Board intends to meet the Goals of the Directive (with help from Technical Working Groups (not yet established) and IJC staff). **[IJC - feedback]** M. Gay asked the length of the info gathering phase. S. Swanson explains the how/where/who for data is phase 1 of study. Current goal is to make the entire IJC board aware of all current data (ex. RAEMP reports under EMC, then LLC & Collaborative databases have already been communicated). First job is to get all Board members up to speed. There needs to be a broad understanding of where there are lacks versus lots of data (e.g. EVR monitoring data is voluminous). Data trust is also important! 3 advisory groups to study board (1) public (2) industry (3) government including FN.

[Symposium] LLC, ERA and YQT to align goals to ensure a successful symposium. Current theme is focused around drought, with the thought to host in Grasmere on YQT land as an opportunity for bringing First Nations together with key decision makers and how to cater monitoring and decision making to learn from YQT community and their perspectives and rally behind the theme. E. Matveev says there's no set invitee list yet, to answer question from K. Story **[symposium - funding]** target for raising $30-40,000 with $5,000 approved from PICS and $7,000 in Collab budget. K. Munkittrick thinks IJC may have funding opportunities through its engagement component. S. Swanson to explore possibility while in Whitefish for IJC meeting. Adequate notice will be imperative. M. Low expresses how this event could assist CLEAR and S. Rood suggests Grasmere location could tie in lower watershed and Elko dam. Suggests inviting

	BC Hydro.
Data visualisation app	**[App - purpose]** App is for data exploration, *not* formal statistical analysis. Data exploration and visualisation will support development of hypotheses which address the Collaborative's Theme 1 and 2 questions **[app - goals]** make data exploration and visualisation more collaborative and efficient as well as easier for people to understand **[app - challenges]** Lots of data not yet in the app e.g. invertebrate data and data from Aquarius database. This and other data not yet in the app because of lack of limited access to known datasets and the need for accessible data sources which provide data in excel or other readily exportable formats rather than in formats such as PDF files. Substantial concern we will hit a wall due to data insufficiency. This is a potential missed opportunity/info gap. There are limitations of data app capability and issues with existing data. Noted issues with tributary assignment, which can lead to dangerous confusion. Noted the need for simplifying the app to make it more intuitive for a more layperson user.

Minutes
[App - data availability] Collaborative's Adaptive Monitoring Framework currently sits at data exploration, hence the need for data overview report. Looking at opportunities for credible and rigorous statistical analysis. Particularly true of downstream mining area but so many studies are already conducted in this area. Need input from ministries & WLRS & EVR because their statistical analysis and perspectives could give Collaborative opportunity to look at data and get better perspective **[E. Matveev]** previously agreed on consolidating existing data. Goal to put databases into a single repository, only focus on Elk River Watershed (no groundwater or lakes) and only on metrics relevant to Collaborative study questions. Matveev answers K. Story's question around repository restriction to only 5 sites, saying we only use publicly available data. **[E. Matveev] [M. Gay] [K. Story] [M. Arnold] [S. Swanson]** discuss EVR's data accessibility and usage. App is looking at more than just mining influences and **[M. Arnold]** expresses EVR's extensive and long-term data collected of which much has been heavily studied and looks further than just mining **[S. Swanson]** explains we want data to be more efficient and easily understood with this app and PDF data outputs are difficult to look through. Further, there is still a broad lack of trust with this data and not many people read the reports to understand it, even though it is also run via the Ministry etc. Collaborative study questions have broad consensus and to answer |

	these we know we're lacking in non-mine data. **[E. Matveev]** plans to cite EVR data in the report but we do need accessibility, of which currently lacking. We don't want to replace EVR collected data, just want to make it better presented and easily digestible/interactive. **[S. Swanson]** and **[K. Story]** discuss expanding data for the app but ideally need excel format and express concern we will hit a wall with data insufficiency due to widely accessible data. **[Data - benchmarks]** Still working on qualifying benchmarks. These won't just be water quality guidelines but also risk-based like the EVWQP and EV-CEMF. **To discuss further at next meeting** - talk about cumulative effects & steps in understanding the sliding scale of precautionary to risk based decision making. **[N. Lapointe]** stresses multi-sectoral eyes determining benchmarks. Has tried to pursue research into environmental impacts and build trust in results and get away from biases, but not at large scale. **[E. Matveev]** calls for anyone who knows of other missing data or good upload procedures. **[App - live demo questions]** E. Matveev and N. Lapointe to meet post-MWG and discuss **how to track data changes** from the original dataset **[E. Matveev]** and **[M. Arnold]** discuss how to better classify mainstem and tributary data and the current difficulties around streams with 'local' names, as well as monitoring gaps (point made by **[B. Annable]**. EVR offers to help with this in November **[app - general feedback]** MWG members express positive feedback about the app such as intuitive interface. Stress it's not ready for public consultation for a number of reasons e.g. potential for some parameters to be used to confirm biases. Reiteration this app is just a lookup/visualisation tool, not data analysis. To look into adding additional column for quality comments.
Data overview report development	**[Report - goal]** is to provide an accessible summary of data available in the watershed relevant to decision-makers and community, without duplicating detailed scientific reports. Note this report does not aim to analyse data, but provide an overview of existing data. **[Report - challenges]** Gaps in data on fish populations and habitat. Challenge of using parameters in assessing habitat conditions, acknowledging that fish movement and habitat access vary seasonally. Extreme challenges in accurately assessing fish population data. Noted parameters will be viewed through a lens of fish habitat, but will be careful not to make excessive inferences about implications to fish populations. **Minutes**

	Active MWG discussion on fish habitat and data. Report aims to look at some fish habitat material but not fish populations due to lack of data and how this data can be subjective over time. Fish population data can be useful in the short-term but more about how it's used and alongside what other metrics. Fish are dynamic and move a lot. Recognised we need information from outfitters and First Nations to fill gaps **[S. Swanson]** recognises both B. Annable and J. Bisset give advice or 'just in time' for fish data, so there's a reason why we have goals to focus on temp and water level. Trying to just contribute data that adds to understanding so when things go badly we can say more about what parameters might play a role. Decision makers want to know indicators of looming issues. Relates to climate, temperature and flow. Perils of trying to get our arms around the situation at population level. **[E. Matveev]** to make clear which parameters are being looked at through a fish lens in the report. Need to make it clear that a section of the report will be missing data. Talk about why getting a fish assessment is difficult and then next report could put together a monitoring plan for future years and would slot this there to get idea of populations **[S. Swanson]** to put together a round table discussion on fish populations. Start session with SMEs (Jon, Bill etc), and then solid discussion to identify what is stopping us from doing something on fish population. Want to build some momentum as soon as we can manage rather than wait until we finish reports etc. Takes time to build social momentum and will. Must include YQT as well. Use sturgeon as an example! **[Data report - bibliography]** Will have a bibliography at end of report and MWG members are encouraged to provide Evgeni or Caitlin with any obvious reading material for the report. We are a small team and any principal/overview papers, or similar report to what we are trying to achieve.

APPENDIX 1:Initial Study Questions Extracted from 20230119MWG_V2

Theme 1: *Climate change driven flood and drought*

Relative to Baseline:

"Are we seeing changes in the frequency and severity of **extreme flows**?"

"Are we seeing temporal and/or spatial changes in water column **turbidity**?"

"Are we seeing temporal and/or spatial changes in **water temperature**?"

If yes:

"Can we confirm the change?"

"What is the magnitude and extent of change relative to baseline?"

"Are the changes showing consistent trends?"

"Are there correlations among indicators and if so, are these correlations consistent or do they vary seasonally/annually?" Click here

"Are there correlations between indicator changes/trends and land use or climate trends? 10

Theme 2: *Fish habitat*

"Are **flows** meeting the needs of fish in all seasons and all life stages for fish ?" *"Also look at the percent of time spent during the year below environmental flow needs threshold" - Ashley J.*

"Are **turbidity** levels meeting guidelines for the protection of fish habitat for salmonids, including Westslope cutthroat trout and mountain whitefish?"
"Add TSS and particle size distribution." - Stella S.

"Are **water temperatures** staying within the tolerance range for Westslope cutthroat trout and other salmonids such as mountain whitefish and bull trout?"

"Are **water quality** parameters staying within BC water quality guidelines for the protection of aquatic life?" *"Specify the suite of parameters?" - Chris Hust*

"Are **benthic invertebrate** communities staying within reference conditions (abundance and species diversity)?"

*"Specify and confirm the fish species you want to look at." - Cait G. "Adapt these questions to the language from BC's Water Sustainability Act" - Jessica M. "Add **triggers** to warn us at that we are experiencing changes and moving towards exceedances." -Kelly M. "Exceedance points - **benchmarks** and **guidelines** - are hard to establish for some parameters but if we are able to establish these, it gets easier to measure indicators. Proposes to look at the range and duration of exceedances" - Nick L.* Click here 17

Theme 3: *Ktunaxa land and water uses*

"What are the **traditional** Ktunaxa land and water uses in **Qukin ʔamakʔis?**"

"What are the **current** Ktunaxa land and water uses in Qukin ʔamakʔis?"

"Where, when and what traditional Ktunaxa land and water uses were **lost** in Qukin ʔamakʔis?"

"Where, when and what traditional Ktunaxa land and water uses have **declined** in Qukin ʔamakʔis?"

"Where and what can be **restored**?"

Appendix 2: Parameters Addressing Study Questions
THEME 1: Climate Change Driven Flooding and Drought

- **Water Flow**

- o daily and seasonal fluctuations, annual min-mean-max
- o % of time in the year water was below 20% annual mean flow
- o Date of annual peak flow
- **Water temperature**
  - o daily and seasonal fluctuations, annual min-mean-max
  - o number of days with Tmax > 15 °C, > 18°C, > 20°C
  - o Warmest and coolest streams
- **Air Temperature**
  - o daily and seasonal fluctuations, annual min-mean-max
  - o number of days with Tmin $<$-15°C, $<$-25°C
  - o number of days with Tmax > 25 °C, > 27°C, > 29°C, > 30°C, > 32°C, > 37°C
- **Precipitation**
  - o Annual max 1-day total precipitation
  - o Mean annual precipitation
  - o Max # of consecutive dry days with precipitation <1 mm
  - o Peak snow depth, date of peak snowpack depth and date at which snowpack begins to melt (mm)

THEME 2: Fish Habitat
- **Benthic Invertebrates**
  - o Biodiversity: temporal and spatial variation, EPT proportion
  - o Abundance: temporal and spatial variation
- **Water Chemistry**
  - o physicochemical parameters: water conductivity, dissolved oxygen and pH
  - o major ions: Na, Ca, K, CO_3^{2-}, HCO_3^-, SO_4^{2-}, Cl-,
  - o ICP-MS metal scan: Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Hg, Mo, Ni, P, K, Se, Si, Ag, Na, Sr, S, Tl, Th, Sn, Ti, W, U, Vn, Zn, Zr
  - o nutrients (NH_3, NH_4^+, $N-NO_3^-$, $N-NO_2^-$, TN, TP, PO_4^{3-}, TOC, TIC.
- **Water Temperature**
  - o Spatial and temporal variation with relationship to optima and thermal limits for Westslope cutthroat trout
- **Water Flows**
- **Turbidity**

Potential Land Use Indicators
- road density (km∕km2)
- road density < 100 m from a stream (km∕km2)
- road density on potentially unstable slopes (km∕km2)
- stream crossing density (# per km2)
- riparian disturbance (km∕km)
- proportion of riparian disturbance (%)
- proportion of wetland disturbance (%)
- proportion of total land disturbance (%)

- proportion of private, crown and fed land ownership (%)
- number of mines
- number of permitted waste discharge points
- number of licenses water withdrawals
- number of dams
- equivalent clearcut area (km2)
- forest stand recovery (km2)
- area impacted by wildfires (km2)
- area impacted by insect outbreaks (km2)