Appendix A - Workshop Agenda and Summary

Associated Environmental

Date:	March 23, 2016		
Time:	9:00-4:00	**Page:**	1 of 1
Project:	Collaborative Development of Operational EFN-Setting Methods for the Okanagan		
Subject:	Workshop		
Client:	Okanagan Basin Water Board and Okanagan Nation Alliance		
Location:	1430 KLO Road, Kelowna, BC Board Room at Okanagan Regional Library Administration Building		

AGENDA

Topic:	Time
1. Welcome from the project partners and consulting team	9:00-9:20
2. Overview of workshop format and desired outcomes	9:20-9:30
3. Roundtable introductions and context-setting from attendees	9:30-10:00
4. Presentation of the draft recommendations for EFN-setting methods	10:00-10:45
COFFEE BREAK	10:45-11:05
5. Hear initial thoughts and questions from each attendee (each person will have the opportunity to speak for about 2 minutes with no interruption or discussion)	11:05-12:00
LUNCH (to be provided at the workshop site)	12:00-1:00
6. Group discussion about recommended EFN-setting methods guided by questions from the study team and input from agenda item #5	1:00-2:30
COFFEE BREAK	2:30-2:50
7. Group discussion about further studies needed to implement EFN-setting methods	2:50-3:30
8. Summary and next steps	3:30-3:45
9. Closing comments	3:45-4:00

Date:	March 23, 2016		
Time:	9:00-4:00	**Page:**	1 of 9
Project:	Collaborative Development of Operational EFN-Setting Methods for the Okanagan		
Subject:	EFN Project Phase 1 Workshop		
Client:	Okanagan Basin Water Board and Okanagan Nation Alliance		
Location:	1430 KLO Road, Kelowna, BC Board Room at Okanagan Regional Library Administration Building		

RECORD OF MEETING

This Record of Meeting is considered to be complete and correct. Please advise the writer within one week of any errors or omissions, otherwise this Record of Meeting will be considered to be an accurate record of the discussions.

Workshop Attendees:

Andrew Petersen	Ministry of Agriculture
Anna Warwick Sears	OBWB
Bernie Bauer	UBC Okanagan
Brian Guy	Associated Environmental
Christian St. Pierre	FLNRO – Ecosystems
Craig Nichol	UBC Okanagan
Don Dobson	Urban Systems
Doug Edwards	Fisheries and Oceans Canada
Elinor McGrath	ONA Fisheries
Hillary Ward	FLNRO – Fish & Wildlife
James Littley	OBWB
Jason Marzinzik	FLNRO – Allocation
Jason Schleppe	Ecoscape Environmental
Jen Turner	Ministry of Environment – Watershed
Joe Enns	ONA Fisheries
Kim Hyatt (by phone)	Fisheries and Oceans Canada
Kellie Garcia	Associated Environmental
Michael Epp	FLNRO – Allocation
Natasha Neumann	UBCO
Nelson Jatel	OBWB
Phil Epp	Consultant
Rich McCleary	FLNRO – Stewardship
Richard Bussanich	ONA Fisheries
Ron Ptolemy (by phone)	Ministry of Environment
Ryan Whitehouse	FLNRO – Ecosystems
Skye Thomson	FLNRO – Water Management

1. Welcome from the project partners and consulting team

The workshop began with a welcome from Dr. Anna Warwick Sears, Executive Director of the Okanagan Basin Water Board (OBWB). Anna stressed the importance of the environmental flow needs project to water planning, restoration, and regulation in the Okanagan. She emphasized that the project is a three-way partnership between the OBWB, the Okanagan Nation Alliance (ONA), and the Ministry of Forests, Lands and Natural Resource Operations (FLNRO). It will be delivered in three phases: Phase 1 focuses on determining the best methods for calculating EFNs for Okanagan streams, Phase 2 will involve applying the methods, collecting flow and habitat data and doing the modeling to actually calculate EFNs, and Phase 3 will consider the many different types of users, and the complexities of meeting human needs and responding to shortages.

Rich McCleary from FLNRO spoke next. He began by stating that this project is a big opportunity to get EFNs right in the Okanagan. The WSA states that managers "must consider EFNs" when making decisions. He encouraged the younger participants to take up the charge from the older more experienced practitioners. He mentioned that pressure on water in the Okanagan will likely increase, and that water managers can't just say "no" without a strong rationale.

Richard Bussanich from the Okanagan Nation Alliance (ONA) Fisheries Department gave his welcome next and set the context from an ONA perspective. He talked about the four-dimensional way of thinking that guides the ONA: relations, heart, soul, and integrity. He expressed thanks and appreciation to all participants for being here to work together. He emphasized the importance of adaptive management, and of being accountable to future generations when we do work like this EFN-setting methods project. He talked about feeling a responsibility to all Okanagan First Nation members on both sides of the Canada/US border.

Dr. Brian Guy, Project Manager from Associated Environmental, introduced the study team present at the workshop (Jason Schleppe, Phil Epp, Don Dobson, and Kellie Garcia) and listed other consulting team members (Brent Phillips, Kyle Hawes, Steve Matthews, Drew Lejbak, Lars Uunila, Bob Hrasko, and Brian Symonds). He talked about some core principles that have guided the consulting team's work, such as including a diverse group with a wide range of experience both in the consulting team and in the review group, and leveraging experience and knowledge in the Okanagan. He gave an overview of the project status, schedule and deliverables. He told the group that the final report will be called Working Document Version 1 to allow time for more input from First Nations and government agencies. Lastly, he emphasized that the main purpose of the workshop is for the study team to listen to and document feedback on the draft recommended EFN-setting methods.

2. Overview of workshop format and desired outcomes

The facilitator, Kellie Garcia, ran through the agenda and described the process for the day. She defined her role as a facilitator and outlined the ground rules for the workshop (all voices heard; be candid and speak your mind; one speaker at a time; stay focused; limit sidebar conversations, and debate the issue, not the person). She told the group that the key goals of the workshop were to address technical questions about the recommended methods and identify opportunities for improvement.

3. Roundtable introductions and context-setting from attendees

One-by-one, the attendees gave their name, organization and department and then described why they were at the workshop (e.g. what they brought to the technical exercise and why EFN-setting is important to their work).

4. Presentation of the draft recommendations for EFN-setting methods

Dr. Guy and Phil Epp gave a presentation on the draft recommended EFN-setting methods. Dr. Guy began by walking the group through the Interim Report while giving a high level description of each section. He emphasized that the report is not the final deliverable, but an interim technical document with the sole purpose of outlining two recommended methods for EFN-setting. Chapter 2 provides information on the various types of EFN-setting methods that have been used in Canada and elsewhere and then focusses on EFN-setting in the Okanagan and on the strengths and weaknesses of methods previously used here (BC-modified Tennant, BCIFN desktop method, and Weighted Usable Width method).

Dr. Guy discussed some of the key principles included in Section 3 of the Interim Report, and told the group the two recommended methods are a desktop method (the “Okanagan Tennant” method), which is based on the BC modified Tennant method but with new aspects that overcome limitations of that approach, and a field-based method (the “Okanagan Weighted Usable Width” method) that builds on the strengths of previous field-based methods.

Brian then moved on to describe the contents of Chapter 4, which provides guidance on actually applying the two methods to specific tributaries. He mentioned that since the Interim Report was finished last week, the study team has developed process flowcharts for the methods that have been handed out for reference here and will be incorporated into the report. He referred to Chapter 5, which provides a list of knowledge gaps that could be filled to improve the methods and make them more efficient. Lastly, he outlined the contents of the four report appendices.

Phil Epp followed with a thorough technical review of the recommended methods. He walked the group through Section 3 of the Interim Report, provided photos of Mission Creek and Trepanier Creek at various flows to help illustrate and support the methods, and referred the group to the flow charts and the examples and other supplemental information included in Appendices C and D.

5. Hear initial thoughts and questions from each attendee

Each attendee was given time to provide feedback and ask questions about the methods, without discussion or debate. The feedback was recorded on flipcharts. The feedback is summarized below.

Dr. Hyatt: Agrees with the general direction of the recommended methods, but would like to see more consideration of fish meta populations. The EFN-setting exercise should not just focus on streams as individual units, but be able to consider the connectivity of streams and how fish use the network to survive during times of stress (e.g. droughts). Anthropogenic disturbance has decreased access to refugia and altered connectivity so fish don’t have as many options as they did in the past and are less resilient.

Ron Ptolemy: Agreed that the approach is sound. Expressed some discomfort with some of the text on page 10. Referencing of the fish periodicity charts in the Interim Report could be improved.

Rich McCleary: Pleased with the Interim report. Described Okanagan-style adaptive management: through collaboration, infrastructure upgrades, and other measures, and 2) through regulation under the *Water Sustainability Act*, which gives the ability to add restrictive clauses. The first type of adaptive management is more desirable, and is currently happening in the Okanagan. Consideration 2 in section 3.2 is very important (understanding the degree to which current licensed water uses are impacting EFNs). Lastly, the natural hydrographs that are developed for the Desktop Method (page 20 of the Interim Report) should be compared to actual operational hydrographs to see how similar or different they are.

Christian St. Pierre: Likes the proposed approach. Using percentile base to adjust MAD is a good thing because it gives flexibility in the methods. Adaptive management is labour intensive so having a consistent method that everyone can agree on and work with will be useful.

Ryan Whitehouse: The literature review that was done for the study is useful. Like how the methods use median flows. It would be useful to move to weekly time steps during the irrigation season and fall spawning. Suggests expanding the WUW method to include substrate.

Jen Turner: The methods provide a good foundation, gives good technical background without drowning the reader. Phase 2 will be really important. Graphics and more detailed examples in the report are useful and should consider adding more where appropriate.

Hillary Ward: The methods do a good job of balancing hydrology and biology. More thought should be given to the definition of EFN. Density dependent processes should be taken into account because flow needs depend on quantity of habitat but also quantity of spawners. Important to try to quantify implications of not meeting target flows. We need to look at the bigger picture and assess the habitat availability in all tributaries and how fish use the streams in times of need. Historically, if a fish couldn't spawn in a stream because natural flows where too low, it could go next door to another stream, but now most streams are managed.

Skye Thomson: Good draft. We need EFN-setting methods that will make it scientifically defensible to say "no" to water licence applications where appropriate. Will be easier to balance different water user interests when we are all using a consistent, agreed upon method to calculate EFNs.

Andrew Petersen: The agricultural industry is more concerned with water availability for existing licences than it is about new licences.

Joe Enns: Like the use of percentiles in the methods. Is there a way to project into the future so we can be proactive instead of reactive? We need a way of better predicting what kind of year it will be (e.g. we're heading into a P5 year) and approaching water users ahead of time to get them on side. Consider using Froude numbers to quantify stream

habitat. Because fish are so variable, consider using macroinvertebrates as indicators as well. Agreed with HW and KH regarding fish behaviour when accessing a stream to spawn – they will move to an adjacent stream if access is difficult.

Craig Nichol: Likes the report. Likes the separation between science and society. More hydrographs and other graphics could be used to explain the methods. Methods should also consider the impacts of long term pumping of groundwater on the tributaries. Hydrology in the Okanagan includes above ground processes in the spring (freshet) and base flow and underground flow at other times of the year. Groundwater processes are less variable. September and October could be included in the "risk" time and looked at using daily or weekly discharge time steps. Keep in mind that a bad year also affects future risk (e.g. in four years when fish come back to spawn).

Doug Edwards: Agree that the proposed approach is rational. Agreed that EFN-setting should somehow consider groundwater extractions and water temperatures. Also agree that Froude numbers could be used to improve habitat assessment. Appropriate EFN-setting often comes down to the availability of data needed to use the method. Lastly, the variability between streams (e.g. geomorphology, groundwater) needs to be considered in the methods.

Mike Epp: The methods provide a good balance between simple and complex, and should yield defensible EFNs.

Jason Marzinzik: Under the WSA he's now looking to licence groundwater, so needs to know EFNs for streams connected hydraulically to wells. Larger streams are fully recorded, smaller streams are not and they have little information available to help allocation officers make decisions. Having EFNs for the smaller streams would really help.

Richard Bussanich: Would be good to add First Nation translations for names of fish and places to the report. Good communication is a part of adaptive management. Need to make the report more accessible by creating an epilogue with user-friendly language that outlines the vision and principles and captures the commonality of the people involved in developing these methods.

Elinor McGrath: Like that the method uses percentiles. Need to get a better grasp on risk of not meeting EFNs for each tributary. Would like report to give more guidance on how to incorporate temperature into the methods, and possibly substrate. Implementation of the methods will be important; need to determine what resources will be available to carry this out. She will lead the process of integrating Traditional Ecological Knowledge into the working document.

Bernie Bauer: Agree that the EFN-setting exercise should consider metapopulations. Climate change also needs to be considered; EFNs should be able to accommodate extremes. The Interim Report is a good document but seems like a political compromise; we should be actually setting EFN numbers and the methods to do so should not be too simple. We should figure out what the optimal flows are and what happens as the flow is reduced. Detailed biology needs to be included in the methods. Agree that Froude numbers could be useful. What is underlying the statistics used to determine medians and percentiles? Need to take another look at the statistics to make sure they are correct.

Anna Warwick Sears: The policy environment is changing rapidly, more so than biological response (which is mostly stationary). We need to take the time to get the policies and methods right and gather data for specific streams. We

need to think about how to build flexibility within groundwater licensing.

Nelson Jatel: Be sure to provide clear definitions of terms used in report, for example, natural flows versus naturalized flows.

6. Group discussion about recommended EFN-setting methods

Key questions and suggestions for improvement emerged from the feedback received during agenda item 5 and were brought forward for further discussion. These included:

1) Consider the big picture, including connectivity of streams, how metapopulations function, and the impacts of climate change on flows and habitat availability.
2) Provide more guidance on how other factors can be considered in the methods, including temperature, substrate, groundwater influence, and macroinvertebrates.
3) Consider using more frequent time steps into September and October (irrigation season, spawning).
4) Further evaluate whether the recommended methods achieve an appropriate balance between simplicity and complexity.
5) More graphs, photos and scenarios would help to explain methods.
6) Language in document needs to be clear (i.e. define terms), simplify jargon.

A group discussion followed. A summary of the discussion is included below.

Andrew Petersen: We are already below what we would like to be in many streams in the Okanagan. What about critical flows? How do they factor into the methods?

Rich McCleary: The work will be used in two ways: (1) allocation, (2) to see how well we're doing at meeting EFNs. The report could identify other potential uses. We should identify where our knowledge is lacking and proceed with research, recognize that we have some general guidelines for critical flows. Good analogy: "critical environmental flow" is equivalent to "permanent wilting point".

Jason Schleppe: It is hard to collect data to define critical flow because it is difficult to determine when the system will collapse due to the complexity of the systems.

Skye Thomson: Are we just considering fish or other organisms too?

Ron Ptolemy: In EFN literature, much of the riffle analysis has focused on insects.

Joe Enns: Need to build resilience into systems – connectivity, multiple fish stocks, food webs, etc.

Anna Warwick Sears: Need to be conservative about setting EFNs and issuing licences until we understand metapopulations better.

Bernie Bauer: On page 12 of the Interim Report – the sentence "It is accepted that water withdrawals will result in flows below EFN values at lower flows…" needs to be explained better and the statistics needs to be right.

Christian St. Pierre: EFN is there to assist with management, critical flow is when regulatory action is taken.

Mike Epp: Critical EFN threshold holds a different meaning than EFN in regulatory framework. Future licences may have more clauses and can be guided by EFN.

Anna Warwick Sears: EFNs should have range of flows as reference, not be a single line.

Jason Schleppe: Might need periodic bumps in flows – EFN should be a dynamic number, not set in stone at one magic number.

Rich McCleary: Should add hydrographs to the report that show the surplus water available in some years.

Joe Enns: If you are constantly below EFN but not acting until you reach critical EFN then you aren't managing the streams well. Active management needs to occur well above the critical low flow threshold.

Jen Tuner: Include an example application in the report.

James Littley: What does a properly functioning ecosystem look like in the Okanagan? Is today the baseline or something in our past? Are we beyond having any proper functioning in the Okanagan? Can we use TEK and our learnings about ecosystem services to define proper functioning?

Richard Bussanich: First Nations mandate is "put the water back, put the fish back."

Joe Enns: We should be managing to what we want it to look like.

Anna Warwick Sears: We will have room to change our management practices and make things better. But will we be able to change EFNs if things get worse?

Jason Schleppe: Need to determine what tools we have available to achieve management goals and make sure the technical information we are collecting fits into the regulatory framework.

7. Group discussion about further studies to enhance the recommended EFN-setting methods

Dr. Guy directed the group to Section 5 of the Interim Report, which includes a listing of suggested additional studies that could be completed to improve the methods described in the report. He emphasized that none of the studies are necessary to do before the methods outlined in the Interim Report can be used; they are not barriers to implementation, but rather opportunities for improvement. The studies are listed in the report in approximate order of urgency and importance.

Jason Schleppe provided an overview of the 11 further studies listed in the Interim Report (p. 21). He described how each study was linked to the recommended methods and exactly how each would help to improve the methods.

The presentation was followed by a group discussion. The discussion is summarized below.

Elinor McGrath: We have seen pretty good relationships between flows and temperature (maintaining base flow helps maintain lower temperatures). Should be able to relate that in the WUW method.

Rich McCleary: FLNRO is working on a project in the Nicola where the group is identifying priority research questions and coming up with a strategy to fill gaps. We could learn from their process.

Anna Warwick Sears: It is good to have this list in our back pockets so we can keep these needs in mind as we are doing Phase 2.

Hillary Ward: Agree that we should evaluate applicability of HSI curves. For example, there are two populations of rainbows in the region (small fish and big fish) and we don't know much about where the big rainbow spawn.

Joe Enns: Will the WUW method calculate EFNs by reach or one EFN for the entire stream?

Jason Schleppe: Can set EFNs for multiple reaches.

Phil Epp: Methods don't preclude either. Can set EFNs in lower reaches and upper reaches must have the same or higher EFNs (when expressed as percentages of flow).

Bernie Bauer: What is the process for assessing these draft methods? Should run through the entire process on two or three tributaries and make adjustments based on learnings.

Ron Ptolemy: We'll rely on experts in stock assessment. The HSI curves are quite accurate and a certain amount of validation has already been completed. Has parr data for Mission Creek.

Phil Epp: HSI curves are quite easy to put together for kokanee but not all that easy for rainbow.

Jason Schleppe: Need to define indicators of ecological function and determine success using a multi-prong approach.

Rich McCleary: Go back to the periodicity chart and evaluate success for each row.

8. Summary and next steps

Dr. Guy and Kellie provided a summary of the day and outlined next steps. Dr. Guy reminded the attendees that they

can provide additional feedback on the comment sheets handed out at the beginning of the workshop or through email before March 31. The consulting team will produce the first version of the report on Phase 1 – called Working Document, Version 1 – to the OBWB, ONA and FLNRO project partners by the end of April. The document will be sufficiently sound to allow for some EFN-setting work to proceed this summer but not so final as to be considered the last word. This will allow for a longer period of review and comment – leading to the eventual revision as Version 2. And in the medium and longer term the document can be a living document, subject to periodic revision as the methods become further refined and improved through experience over time. Kellie added that a workshop summary will be prepared and distributed to participants in the next couple of weeks.

9. Closing comments

Dr. Warwick Sears, Rich McCleary, and Richard Bussanich provided closing comments. The each thanked the others, the consulting team, and the participants.