Fraser River Gravel Reach Sediment Management
Long Term Planning Meeting

Meeting Notes: March 14, 2011

Attendees: DFO: Craig Sciankowy, Jason Hwang, Laura Rempel
MNRO: Alec Drysdale, Julia Berardinucci, Keith Anderson, Lotte Flint-Petersen, Erin Stoddard, Timothy Bennett, Scott Barrett
EMBC: Ann Griffin (Chair)

Regrets: MNRO: Allan Johnsrude, Jennifer Karmona, Ross Douglas
TC: Roberta Dight, John Mackie
EMBC: Chris Duffy, Ian Cummings

1. **Introductions**

2. **Presentation: Sediment Management in the Fraser River Gravel Reach (Laura, Lotte and Erin)**

   Questions/Discussion during presentation

   Alec: In an ideal world what should gravel deposition look like in the upper reach?

   Lotte: If we can pass the design flood event (that occurred in 1894) and the water level is within the freeboard of the dikes, then any additional habitat, etc. that we can create is fine.

   Ann: Keeping track of current sedimentation rates is important to be able to evaluate how much sediment is accumulating, and how that might change over time.

   Erin: In the natural world, it is expected that deposition goes up and down - species have adapted to these trends. In an ideal world that is what would happen, but because we're in a settled, highly-developed area, we have to make compromises for flood protection. However, that doesn't mean that we should make ecologically unsound management decisions.

   Lotte: Important to note that chart of deposition/loss rates reflects the period from 1952-1999. EMBC's (Oct 2009 NHC report) also references data from 1999-2009.

   Craig: Will the new Fraser River model provide localized (site-specific) information?

   Lotte: No, it will be more global in scope for its first iteration. Over time, we hope to improve the model to become more and more accurate/representative of localized information (shift from 1-D to 2-D and/or 3-D).

Erin: There are guidelines around floodplain management but municipalities are continuing to develop in floodplains. Who, in government, is dealing with floodplain management?

Ann: The Premier made a commitment of $10 million over 10 years to help communities with flood management/protection activities. EMBC and MNRO work with municipalities to develop zoning, floodplain management strategies, etc. This year, approximately $6.1 million will go to dike upgrades, while $650 thousand went to gravel removal. Sediment management (gravel removal) is a small piece of the provincial strategy to deal with flood risk.

Erin: But once municipalities develop within the floodplain, the program seems to focus on raising dikes - protecting what's already been put in the floodplain. What about preventing development in the floodplain from the get go?

Lotte: MNRO provides provincial diking guidelines. We do not provide guidelines for development in flood plain areas. That responsibility lies with the local government. It used to be MNRO's (MoE technically) responsibility but that responsibility was shifted to local government some time ago.

Erin: We need clarification around the responsibility of local government to manage floodplains.

Lotte: There simply isn't funding/resources for floodplain management right now. For the time being, all effort is being focused on dike construction, maintenance and upgrading and gravel management.

Erin: Ecosystems managers would prefer to see a comprehensive approach. Flood management is not addressing all of the issues.

Ann: Erin, can you speak to the difference between the sand and gravel reaches?

Erin: There are 3 major zones – gravel, sand and estuary. There are lots of little bugs (invertebrates) in the gravel habitats that are key to supporting the diverse species mix that we have. The sand reach also has invertebrates, but they are different and do not provide the same food/habitat requirements. Most of the spawning occurs in the gravel reach. The majority of the salmonid species use the gravel reach. The sand/estuary reaches assist fish to transition from fresh to salt water. The estuary reach is where fish acclimatize to salt water.

Craig: So none of the dikes are high enough in the gravel reach?

Lotte: EMBC is providing funds to the municipalities for dike upgrades. Today's standards are much different from when most of these dikes were initially constructed.

For example, on the right bank in the location of Seabird Island FN, the railway embankment provides some flood protection , but the crest is not high enough and will be overtopped during the design flood event.Funding for FN land dikes is through INAC.

Ann: None of the dikes in the gravel reach meet the standard to withstand a flood of record. Raising dikes is not a simple task and requires 6 m of horizontal real estate for 1 m vertical increase in dike height. In some areas, it is not possible because the crown doesn't own the land adjacent to the dike. Also, dike breach and seepage is more likely than dike overtopping, and there is a point when dikes cannot be further raised without loss of integrity.

Comment [j1]: Commitment in 2007 was for $100 million plus the Feds in 2008 committed $60 Million over a 6 yr period.

Comment [n2]: This isn't correct – currently there are no provincial staff assigned to work with specific local governments on floodplain management (land use issues). Jesal and I are working with a subcommittee of the Fraser Basin Council to look at flood hazard Land Use issues.

Comment [n3]: Not correct. MNRO publishes the "Flood Hazard Area Land Use Management Guidelines" (latest edition is 2004) pursuant to the Environmental Management Act. These Guidelines must be considered by local government if they decide to adopt a floodplain bylaw.

Comment [n4]: True, but a change in political direction is required as well. A few statements in "Living Water Smart" hint at a possible change in direction.

Comment [n5]: Lotte – could you please advise me of the location of this structure? You are correct there is no such structure. I should have referred to the railway embankment which will be overtopped during the design flood event. I have corrected the text.

Comment [n6]: Should read "fully meet" – some of the Chilliwack Dikes have been raised/widened to the latest profile.

Keith: So once gravel is removed will it just fill in the next year?

Ann: It depends. Some areas fill in rather quickly, while others may take years to refill.

Ann: The BCG KWL report has been our guidance document. We have recognized that this report was specific to hydraulic information and lacked information specific to ecological, biological, social issues.

Keith: Did Church look at profit margins for the gravel removal operators?

Ann: He did not provide that information but I know for EMBC it costs about $10 per cubic meter to remove gravel in the Fraser River, and that is our costs only, not those borne by the contractors doing the work. Profitability really depends on where the project is located. If access is difficult or far away from market it is less profitable. Government does not receive any royalties. This year, the program cost $670,000 (not including staff time, etc.) and no gravel was removed in the end.

Erin: I noticed that many flood management-related reports have been referenced. I think there is a need to consider more of the ecological/fish-related reports that are out there.

Keith: What have FNs indicated they want from this program?

Ann: FN's are almost 100% in support of sediment management. One nation, Skwah Band, is not in favour. Benefits to First Nations are: protection of fishing locations/habitat (they believe gravel deposition is not good as it fills in their fishing locations/habitat), flood protection for their communities, in some cases erosion mitigation, a share of profit from gravel sales and employment opportunities.

Erin: FNs have used two major fishing techniques in the Fraser over the years: set-net and drift-net fishing. Areas typical of set-net (pools, etc.) are now seeing more drift net fishing. Drift net is a lot easier on Sturgeon. Set-net: the gill-net is fixed at a set angle at the top end of a pool to catch fish that are moving through - can't get out once they're caught. Drift-net: the net is moved in the direction of flow along the edges of banks and gravel bars.

3. Long-Term Planning (Round Table)

Questions/Discussion:

Ann: What do we need to know? What will the technical committee look like?

Keith: Is the existing data relevant?

Laura: We need to know where the critical habitats/most sensitive habitats are.

Erin: We have incomplete data with regard to fish-sensitive areas. There is some good data but not enough to really take a comprehensive look.

Ann: The Church report identified four main aggrading areas in the reach (Webster, Harrison, Hamilton-Gill, Tranmer). Depending on the time of year, certain areas will be very sensitive from a habitat perspective. Based off this information, we can design a removal plan that will reduce overall impacts.

Laura: We haven't tried to tackle reach or larger-scale effects. Everything has been site-scale to date. We need to know cumulative/reach impacts in order to have any confidence when authorizing mutli-year, reach-wide permits.

Craig: There are gaps in monitoring as well.

Will DFO sign a new LoA?

Jason: DFO is not determined either way, but is not adverse to a new LoA.

Ann: While EMBC does not view a new LoA as a critical piece, First Nations and Local Government want to see a formal agreement.

Lotte: The public wants to see a letter of agreement. This will prevent confusion about who is involved and for what reasons.

A multi-year approach would likely require the review of many sites through one CEAA process, one consultation process. Annual freshet and sediment budget will affect which candidate sites ultimately get selected for removals in any given year.

Jason: The bigger the proposal, the bigger the environmental assessment. It isn't necessarily easier to assess environmental impacts at separate sites all in one application package.

Tim: I'm concerned that as an objective regulator/statutory decision maker that it may be a conflict of interest for me to participate in the planning process. Am I here to provide advice on the specific permitting process I'm responsible for or to give input on where I think this plan should be going?

Julia: It's both. We have a dual mandate, under the Water Act: to ensure public safety and to act as regulators of water/stream resources.

Julia: Is there any management/technical committee to oversee the dredging of the lower Fraser? What ties can we make/what should we start thinking about for that area of the Fraser?

Ann: I've noted it down as something to keep in mind.

Have formal plans/processes been adopted for flow release from BC Hydro's dams?

Jason: Federally, the flow release strategy (i.e. dams holding back water during flood events) is really a reactive process at this point in time. BC Hydro and Alcan operate on a profit-basis; there generally isn't any formal coordination/emergency protocol in place.

Alec: I think it's important, from the province's side, to consider what will come out of this process to help inform our superiors. We need to consider our marching orders but also know how to move forward from here in a productive way.

Julia: Where are people's comfort levels with regard to how we want to talk about this? Is it possible to drop some of our barriers, have a rational discussion and maybe go back to our senior executive to ask them to reconsider previous policies/mandates (if need be)?

Erin: Our ministry is responsible for permitting development and protecting ecosystems. I think the key is to do both to the best our ability.

Ann: I am here to develop a process that protects public safety as well as ecosystems and does so within a more predictable framework. I'm all for exploring alternative strategies and presenting them but also must work to fulfill my mandate. We can explore and present the possibilities of land acquisition and offsetting dikes, but these are beyond my specific mandate.

Lotte: Dike/flood management is not being looked at from a global perspective because the resources just aren't there. Dikes/flood issues are really being managed on a case-by-case localized basis.

Laura: There is no forum right now to discuss alternatives. The impetus for gravel removal makes sense, conceptually, but there is no hard evidence to support that it is a proven mitigation technique.

Comment [n7]: I suggest that the repeated sediment budget reports are hard evidence that deposited sediment is accumulating. Also the hydraulic modeling done to date (i.e. 2007 profile vs. 1969 profile) indicates that a significant part of the increase in design levels is due to sediment deposition.

Jason: What are the series of protection measures, what are the impacts to fish and fish habitat, can these be offset or mitigated? We need to know, at the end of the day, that this is being done because flood mitigation is the objective as opposed to sediment removal as an objective. DFO isn't trying to direct flood mitigation we just want to see something that is more comprehensive.

Ann: A document rationalizing sediment removal as a component of a flood protection strategy would definitely help to pull all of the pieces together.

Comment [n8]: True – but agencies lack the resources and political/executive direction to manage the problem more broadly.

The existing system has unachievable timelines. Permitting is supposed to be complete by January 1st so that contractors can get the gravel out by March 31, however, the time between when the river levels drop and the time that permits are required is too short to successfully obtain permits.

Jason: From DFO's end, we recognize that problem but I'd be a little bit concerned if we jumped into finding efficiencies from a permitting perspective without looking at the broader flood management program.

Lotte: Developing a Risk Management Framework requires understanding of the benefits, costs and probabilities of occurrence of the different alternatives and this is a long term process. The City of Chilliwack apparently is a pilot in this process so we can use them as a guide. The risk management approach is still in its conceptual stage and is presented as a goal for agencies to move towards. We have to keep that in mind but still be realistic with what we can accomplish under the current budgetary constraints. We need to first establish a critical mass of acceptance within the province to be successful in this approach.

Alec: There needs to be an executive-level meeting around this issue.

Julia: There has been, although not recently. There was clear direction to continue on with sediment management.

Erin: Sediment removal needs to be a component of a bigger picture. Whether it takes years, or not, it's a critical component.
Laura: If we did nothing, how would flood risk change over time? We don't actually have any clue about the rate of flood hazard increase/decrease. What tools are available to assess that question?

Comment [n9]: We do "have a clue". The differences between the 1969 design profile and the profile based on 1999 surveys are at least partly due to sediment accumulation. The new hydraulic model (and future 2-D work) should be the primary tool to assess changes in flood risk.

Lotte: The public is demanding more transparency, more rationale, and I'm totally in favour of presenting a more comprehensive picture of what's going on but I'm more concerned about completely stopping a process just so that we can start to consider a more global approach.

Ann: I've talked with some of our consultants about completing predictive gravel deposition models (20-30 years out, etc.) but the reliability of estimates may not be worth the effort.

Julia: This program and the whole flood management issue do have to accept compromises at some point. It helps to sit in this forum and discuss the issues so that we can "schedule in" or properly prepare for the compromises/limitations in the future.

Jason: This program, as it's been operated to date, has struggled for many reasons. Some are unmanageable (river levels not going down before permitting requirements due), however, others have to do largely with the amount of resources being allocated by government. It may be useful to inform executive that there is a gap. Without necessary resources, our capacity is limited, and we cannot find a comprehensive solution to move forward that satisfies the needs of everyone sitting at the table.

Julia: We have to face the problem and figure out how to solve it with the resources at hand. The reality is that we are going to be operating in a climate with reduced funding, reduced FTEs, etc.

Erin: Some of the decision-making processes used for similar long-term projects are already in place. We can pull from previous experiences, etc. and apply some tweaks. Funding that isn't used (could also be shuffled around to aide in some of the long-term planning processes.

Jason: Monitoring/compensation requirements haven't even been touched yet. These requirements compound over the years. Ideally, it's best to at least understand these gaps and address some of the issues up front. If we jump right into sediment management then there will be key questions/concerns with regard to alternatives.

Julia: The key is getting to the point where we can outline steps forward without getting too overwhelmed by the scope of the project/compounding of issues. We need to find a balance.

Erin: With regard to the long term flood risk framework, if one side is compromising and the other isn't, there is no balance.

Lotte: The long term flood risk framework needs to be developed separately from the long term sediment management framework. That being said, they do need to be linked. It is highly likely that the long term sediment management framework will be selected as the least-cost method for reducing flood profile. There is no point in taking another 2-3 years to determine that, at which point, we will still have the issue of dealing with an inefficient permitting process.

Comment [n10]: Sediment management is a critical part of a comprehensive long term management approach – it may not necessarily be the "least cost".

Laura: What is KWL doing right now?

Ann: They've been asked to provide an outline of what this program justification could look like; a straw-dog for the long term planning rationale (includes program rationale) that will answer questions like why use sediment removal vs. other mitigation techniques? What type of modeling is most effective? etc.

Julia: I don't see the value in having KWL re-justify work that's already been justified in the past.

Ann: This would look into rationalizing sediment management in the broader context of flood management.

4.0 Brainstorming process to develop two frameworks A and B:
(The process used by the participants was to place items on poster paper and stick to the wall. The two tracks below are essentially summaries of what was on these papers**.)**

A. *Long Term Sediment Management Plan for the Gravel Reach*

Goal: Management plan in effect 1 year and 10 months from now (Finish plan by June 2012 to allow gravel removal work to start January 2013.)

B. *Flood Risk and Ecological Protection Plan for the Gravel Reach*

Goal: 1st draft by June 2012

*Note: these are two separate pieces that we're trying to develop/run in parallel

How do we get there? What should they look like?

A. Sediment Management Plan

*****Should lead to predictable and successful removals of a pre-determined quantity (Ann)

Tasks:
(*Who, What, Deliverables*)

1.) Establish Working Group/Panel of Experts:

Who: Group is to be comprised of both a technical and management committee. Committees will meet separately and as a group, depending on project/plan component.

Key Agencies:
- EMBC
- MNRO
- DFO
- Transport Canada

What: Group members are here to work on a plan that addresses a collective mandate (balance of each agency's individual interests, as they relate to the gravel reach).

Deliverables:
- Terms of Reference
- List of committee members
- Sediment Management Plan

2.) Develop Program Rationale

Who: ?

What: Define the problem. Why are we doing this? What is our mandate? The sediment management plan rationale should be linked to the overall flood risk management plan.

Deliverables:

- KWL has been asked to scope out how to objectively assess (through literature review, analytical tools, hydraulic models etc.) the effectiveness of sediment management as an effective flood mitigation strategy

Comment [n11]: Lotte – it may be helpful for KWL to meet with us (MNRO) separately to discuss the broader issues – use of the hydraulic model etc.

3.) Consult and Engage

Who:

- Kent
- Chilliwack
- FNs
- FVRD

What: Stakeholders need to be consulted and engaged up front in the planning process.

Deliverables:

- Begin consultation and engagement process ~1 month from now

5.) Draft a Letter of Agreement
(questions raised about whether a LoA is necessary)

Who:

- DFO
- Province
- Local Governments (?)
- FNs (?)

What: Agreement to work together to develop a long term sediment management/flood risk plan.

- This shouldn't be a prescriptive document.
- Should establish whether engagement and consultation will be separate processes (i.e. define consultation outright in the LOA?)

Deliverables:

- Letter of Agreement (deadline?)

6.) Obtain Meaningful Data

Environmental

Who: ?
What: ?
Deliverables:

1.) Monitoring plan
   - pre-assessment
   - during
   - post
2.) Compensation and mitigation
3.) Assessment

- Should be size-specific (i.e. small removal vs. large removal)
- Need reach-scale perspective to adequately assess impacts

Hydraulic

Who: ?
What: ?
Deliverables:?

Geomorphic/Sediment Budget

Who: ?
What: ?
Deliverables:?

Spatial/GIS

Who: DFO lead?

What: Maps, overlays, etc. of information that will be useful for technical/planning purposes
- gravel removal site boundaries, sediment budget info, flood profile water levels, monitoring locations, sturgeon occurrences, etc.

Deliverables:
- Develop a GIS tool that serves as a central repository for all pertinent spatial data (deadline?)

7.) Establish an Effective/Efficient Protocol for Obtaining Authorizations
Who: ?

What: The permitting process for sediment removal has proven to be challenging in the past. There is a need for coordination between permitting agencies and more effective communication between all parties involved. Multi-year permits have been proposed. Administratively, there are probably a range of options. Which is best?

- Example: Multi-year Federal CEAA and Water Act authorizations, coupled with year-by-year, site-specific Fisheries Act Authorizations.
  - Because a Water Act permit authorizes a particular activity, multi-year permitting is a possibility even when the exact details of year-to-year removals may not be known. A federal EA under CEAA can be conducted in conjunction with a Water Act application for the activity of sediment removal. But because DFO authorizes the harm to fish/fish habitat (and not the activity), multi-year authorizations are an unlikely possibility since rarely could the harm be accurately characterised one or several years in advance of a sediment removal.
- Is multi-year the best approach? Need to consider burden on permitting agencies if large applications with multiple sites are proposed. This also is a large task for EMBC to put together an adequately comprehensive application package to meet the information requirements of all permitting agencies.

Deliverables:

- Develop the options (deadline?)
  - Example: Attach EA to water act authorization
    - Narrow in on desired time frames
      - Up to 10 years + or -
      - BCEAO, CEAA, DFO all have specific review/monitoring timelines
    - Separate CEAA EA for multi-year program and then issue year-by-year authorizations once site details are available?

B. Flood Risk and Ecological Protection Plan for the Fraser River Gravel Reach

**This would inform the sediment management plan framework*

Tasks:
(*Who, What, Deliverables*)

1.) Define the Problem

Who: ?

What: Define the problem (what is the flood risk?). Determine whether this is within the mandate of this group. Why invest time/resources into protection measures that are redundant? Should we be tackling the broader issue of floodplain encroachment? What are the alternative options? Why are we discussing this?

Deliverables: ?

1.) Consult and Engage

Who:

- NGOS
- FNs
- Local Governments

What: Stakeholders need to be consulted and engaged up front in the planning process. Look to existing plans for example consultation framework

- BC Hydro water use plan
  - consultative and steering committees

Deliverables:

- Begin consultation and engagement (timelines?)
- Communication strategy?

2.) Build Case for Risk Assessment Framework to Identify Mitigation Options

Who: ?

What: Quantitative assessment of actual flood risk, identification of mitigation options, consideration of stakeholder concerns, and pros/cons costs/benefits associated with different flood management approaches.

Deliverables: Determine possibility to contract out report for Flood Risk Assessment

- Assess consequences (loss of life, loss of property, etc.) to couple with flood hazard to evaluate overall flood risk under different mitigation scenarios, rather than relying solely on flood probabilities.
- Incorporate ecological impacts into consequence calculations (potential destruction of fish habitat, destruction of fish, disruption to fisheries)
- Incorporate emergency mitigation protocols (i.e. BC Hydro holding back flow during flood events) among other mitigation options (i.e. sediment removal, meandering factor, dike protection)
- Use all contributing factors to carry out risk assessment and cost/benefit analyses
    - Assess risks at site-level, reach by reach, region-level. Each scale may produce very different results.
    - What are the environmental risks, trade-offs, impacts associated with each option?

4.) Review Framework and Provide Justification for the Recommended Approach to Flood Management (the decision):

Who: ?

What: What mitigation options, solely or in combination, are most effective for EMBC to focus on? Stakeholder feedback is an important component here (i.e. telling people what you've decided doesn't feel like engagement).

Deliverables:

- Communication of outcomes to senior executive

5.) Implement Plan

Who: ?
What: ?
Deliverables: ?

5. Next Steps

1.) Develop draft timelines (leads in to consultation timelines)

2.) Continue to develop planning tasks (populate who, what, deliverables)

3.) Develop draft action items

3.) Complete rationale for each plan

4.) Pinpoint a date for technical experts to meet (will need to develop rationale first)

5.) Plan workshop/crash-course with technical experts (early May)

- What techniques (analysis, mitigation, etc.) are appropriate for answering our questions and developing a flood risk management plan?
- Is this feasible?
- Who should be invited? (Contractors should be included)

6. Next Meeting

April 6th, 1-4PM. DFO Boardroom

Agenda Items (draft):

1.) Distribute and review meeting notes

2.) Continue to develop timelines

3.) Plan technical workshop/crash course: who to invite, develop agenda

ACTION ITEMS (Draft)

Person Tasked	Task	Due Date	Status
All	Continue to develop tasks, populate planning framework	ASAP	
?	Letter of Agreement	ASAP	
?	Develop objectives/mandate. Why are we doing this? Need clear justification, program rationale	ASAP	
?	Draft timelines - start consultation	April 2011	
?	Finalize plans for workshop/crash-course with technical committee	April 6	
Jim	Finalize draft meeting notes	March 18	
Erin, Lotte, Laura, Ann	Edit draft meeting notes	March 18	
Ann	Distribute draft meeting notes	March 18	Done
Ann	Set up executive meeting to determin mandate	ASAp	
Ann	Coordinate technical committee of sand reach	ASAP	
Ann	Check for municipal fllod management plans and distribute	ASAP	
Ann	Send out meeting request for April 6	ASAP	Done
Tech, Committee	Provide names of experts to invite	April 4	