

## **Slave Lake Forest Public Advisory Council meeting**

**November 21, 2019**

### **House Keeping and Introductions – Anne Harding, Facilitator with Dialogue Partners**

- We are here to hear everyone's perspectives & share information tonight
- There are several speakers with lots of information to share. We will make the presentations and meeting notes available to all participants via email.
- There are cue-cards on the table and folks can write down questions as the presenters are speaking.

### **McMillan Wildfire Complex Updates – Leah Lovequist, Information officer, Alberta Agriculture and Forestry**

- The McMillan Wildfire Complex began as four distinct fires – 49, 50, 69 and 70.
  - Fire 49 was aggressive and ended up merging with the other fires; forming the McMillan Wildfire Complex.
  - Fires become named based on the geographic area once they are over 200 ha – hence the McMillan Wildfire Complex.
  - The incident management team was involved in managing and overseeing the fires from the beginning.
  - In May 2019 there was little to no moisture in the forest, and things were not greened up yet, making the fire risk very high.
- Timelines:
  - May 18<sup>th</sup> – SWF 49 and 50
    - Conditions were extreme
    - Strong gusting winds
    - No rain
  - May 26<sup>th</sup> – SWF 69
    - Result of lightning
    - Extreme conditions
    - South of Trout Lake
  - May 29<sup>th</sup> – SWF 79
    - Caused by lightning
    - Extremely dry conditions
- The fires grew very quickly and aggressively.
  - Air tankers responded until the conditions became too bad for the pilots.
  - Fires grew from May 18<sup>th</sup> – June 20<sup>th</sup>.
  - McMillan was labelled BH (being held) on June 20<sup>th</sup>.
  - July 1<sup>st</sup> – fire was labelled as 'under control'.
- Precipitation:
  - April: 17 mm (12 mm were snow)

- May: 4.05 mm (half was snow)
- June: 88.93 mm
- July: 307.45 mm (Measured at Marten Mountain forestry lookout).
- 21 inches of rain up until October 21<sup>st</sup>
- Present Status:
  - The McMillan fire is not yet officially out and will continue to burn over the winter.
  - The perimeter is controlled, and monitoring will continue into 2020.
  - Aerial infrared scans will take place in the spring of 2020 to monitor the centre of the fire.
- Reclamation:
  - 90% of lines used has been reclaimed. Dozer guards have been pulled back and helipads as well.
  - Remaining 10% will be reclaimed over this winter.
- Updates:
  - SWF 49 and 50 were determined to be started by arson.
  - RCMP and forestry are continuing to investigate and are encouraging anyone with information to come forward.
- 2019 Season Summary:
  - 167 total fires
  - 274,166 hectares total area burned (mostly from fire 49)
  - 92 fires were human caused & 75 started by lightening.
- Additional information:
  - Applications for wildfire operations crews are currently being accepted for the upcoming 2020 fire season.
- Anyone can sign up to receive updates during the fire season via email from Leah Lovequist.
- You can also download the Alberta Wildfire App and Alberta Fire Bans App to receive current information on wildfire and bans.

### **Marten Beach Flooding from a Hydrology perspective – Ahmad Asnaashari, Hydrologist – Alberta Environment and Parks**

- This presentation will be to quantify the June 2018 and July 2019 rain events that led to the flooding of Marten Beach on both occasions.
- Flooding in Alberta:
  - Alberta has one of the most variable climates in North America.
  - There are 3 main causes of flooding in Alberta:
    - Snowmelt from mountains
    - Rainfall in summer
    - Ice jams (blocks rivers)
  - There is an increasing trend in the frequency and magnitude of floods over the past few decades.
    - More signs of climate change and global warming noticed across Canada.
  - Human footprint and urbanization are changing how water moves across the landscape.

- 2019 Flood:
  - Flood water washed out the Lily Creek bridge at highway 88 on July 25<sup>th</sup>, 2019
    - No vehicle traffic to Marten Beach.
    - 200-250 campers stranded.
    - The precipitation was about the same as it was in 2018.
    - Residents noticed more water in Marten Creek than in 2018 and more severe flooding.
  - July 25<sup>st</sup> - highway 88 culvert fail
    - Same section of culvert washed out in both 2018 and 2019.
  - Flooding to over 60 lots in Marten Beach with damage to both public and private property.
- There are 7 historical events where extreme rainfalls have caused flooding in Marten Creek: 1978, 1987 1988 1996, 2011, 2018, 2019
- Meteorological Stations: Marten Mountain Fire Station and Marten Hills Fire Station
  - Marten Mountain Fire Station:
    - June 11, 2018 – 131mm in 3 days
    - July 25, 2019 – 185mm in 3 days
  - Marten Hills Fire Station
    - June 11-13, 2018 – 185 mm in 3 days
  - AEP has precipitation maps for the province. The concentration of the precipitation was directly over the Marten Hills Region.
  - Equivalent of ~14,000 Olympic swimming pools fell in Marten Creek in 3 days in July 2019.
  - In April and May, the area received only 20% of the normal range of precipitation.
  - In June and July, it received 200% more than the average.
  - At Marten Mountain Fire Station:
    - Day 2 in 2019 received 156 mm of rain.
    - Day 2 in 2018 received 88 mm of rain.
  - In July of 2019, Marten Mountain Fire Station received monthly rainfall within the 90<sup>th</sup> percentile.
  - June's historical mean was 106.39 mm
    - 158.62 mm fell in 2018
  - July's historical mean was 116.06 mm
    - 308.38 mm fell in 2019.
- Rainfall Intensity Duration and Frequency (IDF) is related to total runoff.
  - Rainfall intensity (inches/mm per hour)
  - Storm duration (how long storm lasts)
  - Frequency of rain events
- On July 25, 2019, Marten Hills Fire Station reported 31.8 mm of rain fell in one hour at 2pm.
  - This is charted as a 25-50 year event on the IDF curve.
- In July 2019, Marten Mountain Fire Station's hourly data is not available but using data from monthly totals determines a greater than 100-year event on IDF curve.
- PMP – Probable Maximum Precipitation

- Largest rainfall depth for a given duration that is physically possible over a given storm size area during a certain time of year.
- 374.3 mm – highest number recorded in Alberta and was recorded in Grande Prairie in 1942 in 24 hr.
  - Day 2 in 2019 at Marten Mountain Fire Station = 156.40 mm
- Forest canopies can intercept 14-15 mm of rain, but 150 mm fell.
- Stats have predicted all extreme rainfall events from 1978 to 2019.
- Factors affecting flood magnitude:
  - Watershed factors that affect runoff: peak flow affected by size of drainage area, land slope, shape of watershed, soil type, land cover/vegetation, density and distribution of waterbodies.
  - Climatic factors that affect runoff: rainfall duration and intensity and conditions before the storm.
  - Storm intensity
  - Soil moisture, groundwater levels and snow packs.
- Factors affecting runoff
  - Slope
    - Steep slope = faster runoff
    - Elevation change of about 400 meters from upland areas to Marten Creek, and average slope of 4.5 degrees.
    - Higher elevation will cause more runoff and a higher peak flow.
    - Drainage area at the mouth of Marten Creek is 226.5 km<sup>2</sup>
  - Basin shape
    - A fan shaped basin will have a higher rate of runoff than a long, narrow watershed.
  - Soil conditions
    - Soils were already saturated prior to the highest rainfall event.
      - Soils could not hold any more water resulting in increased volume of runoff.
    - Intense rainfall event exceeded soil infiltration rate which resulted in a higher volume of runoff.
  - Upstream land cover
    - Upland wetlands can be flood generating, while wetlands in the flood plains can help buffer floods.
    - Marten Creek watershed ~30% wetland.
    - Lily Creek watershed ~1% wetland.
    - Upland wetlands hold and store water, but when they reach capacity, they overflow and cause a cascading effect downstream.
  - Other Factors
    - Beaver activity: Beavers are active along the creek. As dams break, flood water is released along with a lot of debris.
  - Additional Information
    - The Lily Creek hydrometric station is the only flow gauge that was active.
      - Water levels rose to 3.5 meters.

- After 2.4 m, the creek floods and measurements aren't accurate.
- Sawridge Creek captured the same storm event on July 25<sup>th</sup> and data was compared to data from Lily Creek.
  - Lily Creek at highway 88 in flood with 33.18 m<sup>3</sup>/s flow coincides with a 100-year return period.
  - Flow estimates at highway 88 for Marten Creek – 240 m<sup>3</sup>/s, Brady Creek – 33.5 m<sup>3</sup>/s and Lily Creek – 31 m<sup>3</sup>/s.

**Watershed Risk Assessment for Marten creek – Dr. Axle Anderson, Alberta Agriculture and Forestry, Forest Hydrologist**

- He received the letter from the community that was sent to the minister of AAF, and the minister has prepared a response.
- His job as a forest hydrologist is to determine the potential downstream risk caused by harvest activities.
- Mike Wagner completed the watershed risk assessment based on the harvest done to date and the project future harvest scenarios.
  - How can we change the likelihood of the large peak flow events?

*Forest Management Planning and Watershed Values*

- Alberta's forest management planning process is hierarchical and uses the sustainable forest management framework.
  - Forecasts 200 years into the future.
  - 20-year spatial harvest sequence.
  - New forest management plan created every 10 years.
  - Annual Operating Plans granted for a 1-year period.
  - All require review and undergo a legislated approval process by the GOA and Registered Forestry Professionals.
  - Hydrological focus comes in at the approximately 20-year planning mark.
- Planning is based on a government approved Standard.
  - Alberta uses the Can/CSA-Z809-2002 Sustainable Forest Management: Requirements and Guidance Document.
  - Includes a public involvement process and monitoring by both the companies and government to ensure all rules and regulations are being met.
  - Plan is based on the identification of values (e.g. watershed, health, biodiversity) and sets out to achieve those values.
  - State of the Watershed is a required report that feeds information into the Forest Management Plan (FMP).
- Operating Ground Rules (OGRs) and Timber Harvest Planning
  - Practices that are used in the planning and while conducting timber harvest operations to implement plans such as the FMP and Regional Resource Plans.
  - Rules and regulations that minimize risk (e.g. from roads, harvesting, forest management operations) and to ensure the FMP is being followed.
  - OGRs are specific to the operating area.

- A percentage of operations are inspected by the government to ensure rules and regulations are being followed.
  - E.g. Inspections of riparian buffers and streamflow crossings.
- One of the key forestry regulations to risks of forestry operations are minimized to watersheds.
- Specific rules to manage for water quality, quantity and streamflow regime.
- Watershed Management and Disturbance
  - Watershed are complex and respond differently across space and time.
    - Similar events do not produce the same responses.
    - Small events affect watersheds differently than larger ones.
    - At large scales, local effects are dampened.
  - Forest disturbance increases water yields.
  - Forest regeneration reduces water yields.
  - Modelling is completed at the FMP level using the Spatial Harvest Sequence (SHS).
    - Model to determine if the Allowable Cut could potentially change water yields.
  - Equivalent Clear-cut Area (ECA) is a modelling approach which describes the effective area of a forest disturbance at a given point in time with regards to hydrological effects.
    - ECA has regulated limits within the watershed.
    - < 30% ECA is considered low risk.
    - In Alberta, ECA takes both upper and lower areas of the watershed into account.

*Are forestry operations having an impact on the Marten Creek watershed?*

- 2 scenarios were modelled.
  - Scenario 1: Larger watershed
    - 23,467 ha
    - Focused on everything upstream of Marten Beach.
    - Less area has been harvested than that which was originally planned in the last FMP for the Marten Creek watershed.
      - 65% less from 2016 - 2020
      - 78% less from 2011 – 2015
      - 11 ha less from 2006 - 2010
    - SHS did not exceed the low-risk threshold for ECA (30%).
      - YTD – harvesting did not exceed low risk threshold for ECA.
  - Scenario 2: 5 smaller watersheds
    - Better scale to understand risk using ECA.
    - Approved for use in FMP planning.
    - Size ranges from 3,130 ha to 7,830 ha.
    - Smaller watersheds are generally more sensitive.
    - SHS did not exceed the low-risk threshold for ECA (30%).
      - YTD – harvesting did not exceed low risk threshold for ECA.
    - Harvest is lower than SHS in 3 out of 5 watersheds.
  - ECA in both watershed scenarios includes permanent disturbances.
    - E.g. pipelines, roads, rural residential lands, and log yards.

### *Assessment Findings*

- The forest harvest footprint is below the threshold considered to cause increases to the magnitude and frequency of stream flow that will have geomorphic significance.
- Forest activities are not a significant factor in the continued flooding of Marten Beach.
- Forestry operations are, at present, considered to be low-risk in this watershed.

### **Flood Impact Presentation – Marten Beach Flood Mitigation Committee. Val Tradewell and John Singleton**

- The group was formed after the 2018 flood and representing both Diamond Willow and Marten Beach.
  - Property tax assessments total \$45 million.
- 150 properties were affected by the floods.
- The community has permanent and seasonal residents. On long weekends the town is busy, and during the off season it is very quiet.
  - Lots of seniors in the community, and the amount of damage to their properties has been severe.
- In 2019 Pat Rehn visited the watershed and experienced the flood himself.
- Over the past year they have been working with the MD of Lesser Slave River.
- The MD hired Golder to do an engineering assessment and make flood mitigation recommendations.
  - Potential solutions include property buyout, river armoring, flood walls and damming.
- Effects of the flooding include:
  - Safety risk to residents and travelling public due to flash floods.
  - Clean-up and repair costs incurred to the residents.
    - Community left with ~1-2 feet of silt to clean up.
  - Government costs include culvert repairs, water pumping, and silt and debris removal.
  - Loss of property value.
  - Loss of insurance coverage if claims are made or inability to obtain insurance.
  - Decreased property values.
- Marten Beach and Diamond Willow are not opposed to forestry and recognize its importance to the local economy.
- Communities are looking for support from the provincial government.

### **Update from MD of Lesser Slave River on Flood Recovery Efforts – Murray Kerik, Reeve MDLSR**

- The MD is very concerned about Marten Beach.
- Every time there is a flood it costs over half a million dollars.
- The provincial government has disaster recovery funds approved for the municipality for the last two floods, but the MD hasn't received any.
- There are multiple factors that are driving the flood risk and flood intensity. It is not a one sector issue.
- Alberta Transportation is talking about replacing the culverts with bridges.

- The culverts were holding the trees back on the north side of the highway.
- With a bridge, the logs will end up right in the community so although water can flow through, there will be issues with debris and silt.
- The MD has a meeting with local MLA tomorrow (November 22, 2019) and this will be on the agenda.
- Working closely with the Marten Beach Community Association and Flood Recovery Committee
- The best option for mitigation will have a cost of at least \$26 million (based on the estimates in the Golder report).
  - Even if the work needs to be done in phases, it needs to happen.
  - Lots of permanent residents qualify for disaster relief funds, but seasonal residents are not covered.
  - Alberta Environment and Parks is conducting a flood risk assessment of the area in 2020.
- Previous 100-year flood mapping was done in 2008.
  - Flood risk mapping is to be done this year.
- If nothing is done, the situation will get worse.
- Federal dollars are available, but the MD may not be eligible if they have not completed some mitigation work already.
  - Provincial funding is needed so this can happen.
- Previous diversion occurring upstream is thought to have brought increased water amounts into Marten Beach.
- Community members need to have their disaster recovery applications in by December.

***Break***

**Panel Discussion**

**Question 1. How are forestry companies considering making changes to their harvest plans as a result of the floods? How will operation be changed?**

Response: Tanis Blocka, Senior Forester in the Slave Lake forest area.

Harvesting is determined through the development of the spatial harvest sequence (SHS) in the Forest Management Plan (FMP). Watersheds, biodiversity and wildlife are all considered in the development of the SHS and the FMP. Watersheds maintained at less than 30% ECA is the target in area. At this point in time, as the FMP is being developed, the information that goes in will impact the new SHS. If companies do all they have to do to meet the current Planning Standard and follows the current SHS, the Government of Alberta will approve plans for harvesting. This is possible to change for the next Forest Management Plan, and the next FMP (currently being developed) is to be approved for May of 2021.

**Question 2. What happens when concerns are raised? Are there opportunities to influence decision making?**

Tanis Blocka

The next FMP is currently being developed for implementation in May 2021. There are opportunities for input prior to the Government's acceptance of the FMP. Questions and considerations are taken into account. Sometimes they make it into the plan and sometimes they do not, but it is all documented.

**Question 3. What about other infrastructure like oil and gas, roads, and gravel mining sites. Are the different departments actually working together and talking across departments?**

Tanis Blocka

Higher level policy framework exists and are being developed. Pipelines and other infrastructure are grouped together under cumulative effects. Local landuse policy will include a multi-stakeholder group and information on how to be involved can be found at <https://www.landuse.alberta.ca>.

Comment from Meghan Payne: In reality, the public have very little influence on Regional Landuse Plans. These plans are so high level that no specific accommodations will be made for the Marten Hills area. The scope of the plan is the entire Upper Athabasca Region.

**Question 4. From the hydrology data over the past years, can a trend in increasing flood frequencies and magnitudes in the Marten Hills watershed be confirmed?**

Ahmad Asnaashari

We don't know because we don't have enough data. There is no flow gauge specifically on Marten Creek but hydrologists are able to project data for Marten Creek based on similar data from Sawridge Creek.

Follow-up question: Why isn't there that data? Isn't it valuable for early detection and warnings to install a meter on the river?

The Government of Alberta staff are trying to hang on to the stations that they already have in place as there are cuts being made. It is unlikely that we will be allotted budget for a new flow station. The new desktop tool developed by the Government of Alberta for estimating flows on ungauged streams will be accessible to the public in 2020.

**Question 5. Are human caused fires possibly caused by cigarettes tossed out of vehicles?**

Leah Lovequist

The McMillan fire investigators ruled out cigarettes and parts from vehicles. The fire was intentionally lit and is labelled as suspicious.

**Question 6. 30% ECA is a coarse type of water management strategy. What happens when risks are exceeded, and unintended consequences occur? Specifically, what options and solutions are possible going forward now that this situation in Marten Beach has suffered some of these lower probability consequences?**

Dr. Axel Anderson

Historically in Alberta, they have used a different method of assessing and predicting watershed responses to harvesting. The area is strategic to forest companies, and the provincial economy, due to the proximity of forests. In order to be good neighbours, there are strategies they can implement. We

are currently experiencing shorter winters and wetter summers. As a hydrologist, I can provide a risk assessment and it is then up to the companies and the provincial government to make decisions about harvest. Often these things come down to political decisions and the science is ignored. ECA is currently not at the 30% mark, so companies have room to work as to not affect downstream values. There are opportunities to influence future landuse activities and people from the region should take an active role in making sure their voices are heard.

**Question 7. Why are there so many logs in river if there are supposed to be protected areas near rivers?**

Dr. Axel Anderson

More information is needed to answer this accurately. Looking at Google Earth, you can see the landscape and previously flood affected areas. You see destabilization of areas from the 2018 flood, which would have been moved and washed downstream in 2019. There are still more destabilized areas, so another flood would result in more debris washing downstream. Another reason for debris is beavers. As one dam fails, another follows in a domino effect. Destabilized riparian areas are likely a big factor in causing sediment, mud flows and the logs in the river.

**Question 8. What happens next in the community? Where can people take concerns and frustrations?**

Reeve Murray Kerik

The Marten Beach Cottagers Association are encouraged to continue letter writing to MLAs. The Government of Alberta must understand this is an issue only they can fix. The MD hired Golder who provided insights and recommendations. There are opportunities for community led riparian restoration efforts. It may seem like a drop in a bucket but planting willows and vegetation on bare ground and bare slopes will help stabilize soils. There is potential to work with the LSWC on a project if there is interest.

Val Tradewell

Val talked to the frustrations shared by the community and those affected by the floods. She mentioned that people are emotionally frustrated and are looking for help.

***Closing remarks and meeting adjourned at 9:00pm***