INTERNATIONAL ST. CROIX RIVER WATERSHED BOARD AND PARTNERS MEETING

Summary Notes
Tuesday, June 19, 2018
Calais, Maine

Participants: Colonel Conde, William Appleby, Richard Morgan, Sean Ledwin, Donald Fox, Ralph Abele, Jessie Davies, Susanne Miller, Robert Stephenson, Robert Lent, Geoff Mercer, Barbara Blumeris, Kathryn Parlee, Glenn Benoy, Susan Daniel, David Hermann, Paisley Meyer, Heather Almeda, Chief Akagi, Alex Hoar, Asha Ajamani, Joe Zydelewski, Betsy Barber, Pam Lombard, Greg Stewart, Vincent Mercier, Nick Satasulis, Jay Beaudoin

Welcoming Remarks
Commissioner Morgan and Bill Appleby

Overview of 2018 Alewife Counts at Milltown (Heather Almeda)

- Handout of alewife counts from 1981 to 2017 provided.
- Process is typically to hand count fish that have gathered in the research trap every hour. Hand counting is used to help identify and assess specific species and general health. In general, alewives tend to migrate up the fish ladder earlier in the run, while blueback tend to migrate up the fish ladder later in the run. Scale sampling is done to help confirm species.
- Once 1000+ fish are counted in the research trap during a one hour period, the trap is left open to reduce stress on the fish and allow them to pass unimpeded. After this, the fish count is done by clicker at 10mins intervals (3x10min intervals during a 60min period and then estimated to determine number per hour)
- For 2018, the Milltown fishway was watered up at end of April and the first alewife were counted on May 8th. Fishway will remain open until there are three consecutive days with no alewife. As of June 18th, there were only 500 fish counted passing through the research trap but counts continue.
- Preliminary results show that the highest recorded daily number was 25,199 on May 29th, with the week of May 29th having the highest weekly count at 130,570. On May 30th, the number of alewife counted surpassed the 2017 annual total. As of June 18th, the total number of alewife counted was 265,878. However, it should be noted that this is an estimate, and likely minimum number, because of use of the clicker method. Several freshwater species were also documented, as well as 181 American Chad (2017 = 54, 2016 = 0)
- If trend continues to grow in future, the trap may need to be left open. Right now, both the hand count and clicker count methods are used. Other count methods are also being considered.

Status of Fish Passage at Woodland and Grand Falls (Sean Ledwin)

- Presentation is being provided on behalf of several partners and to serve as a catalyst for discussions, as well as seek interest in IJC financial support for fish passage and restoration activites
- A recent meeting was held between USFWS, IFNW, Woodland Pulp, Marine Resources, NOAA Fisheries and the Passamaquoddy Tribe to explore and discuss opportunities to improve fish passage at Woodland and Grand Falls
- Woodland dam is the 2nd dam on the main stem of the St Croix River. It was authorized by congress in 1905. As such, it predates the Boundary Water Treaty and is not subject to IJC Orders of Approval for structures located on a boundary water. It is also not regulated by FERC.

- Grand Falls is the 3rd dam on the main stem of the St. Croix River (dam and powerhouse in separate locations with fishway located adjacent to the powerhouse).
- Currently, there are a number of concerns regarding fish passage at Woodland and Grand Falls dams, including condition, length and design/efficiency for multi-species passage (upstream and downstream).
- Improvements in fish passage at these facilities could potentially enable access to areas of the watershed with significant alewife habitat and population potential (one estimate suggests the St. Croix watershed could support 20 million alewife)
- There is a lot of good data at Milltown on alewife passage and restoration but not as much at other sites
- As a first step, a report would be developed to assess options (e.g. designs, benefits/.challenges, feasibility, costs, and available funding/fundraising options)
- Maine is currently working with a consultant to assess conditions and different fish passage options on the Kennebec River, and a similar approach might be used for the St. Croix
- Q: Is there any downstream monitoring of alewife passage or is the focus on upstream passage?
- A: Focus is primarily upstream. There are only visual observations of downstream passage.
- Q: What is the status of alewife in other parts of Maine?
- A: Good but the potential habitat identified for alewife in the St Croix could make it one of the highest, if it not the highest, alewife river in Maine
- Q: What are the negative biological implications of putting more alewife upstream?
- A: Previous concern about negative interactions with bass has been addressed. Where alewives have been reintroduced in other systems there were no significant impacts with bass. Alewives also provide important feed stock for other aquatic species, and are thought to be prey buffer for salmon. Alewives also bring lot of energy from ocean.

Fish Restoration – St Croix/Schoodic Next Steps Working Group (Chief Akagi/Alex Hoar)
Chief Akagi:

- Need for close cooperation among Tribes and other partners
- The biggest effort/focus for the Peskotomuhkati right now is restoration of the people, and particularly those on the Canadian side of the river. Restoration also includes restoration of the river which is of significant value to the people.
- Other issues for the Passamaquoddy include: species in the bay, biodiversity decreasing
- Healthy river = healthy creatures = healthy people (it's all interconnected)

Alex Hoar:

- Alex Hoar, retired from USFWS in January 2018, is volunteering with Chief Akagi to provide expertise on aquatic restoration
- Other aquatic species of particular interest in the St Croix are 1) American Shad and 2) Atlantic Sturgeon. The Peskotomuhkati would like to conduct surveys of American Shad habitat in St. Croix and Atlantic Sturgeon wintering habitat in Passamaquoddy Bay
    1) American Shad
        - A target species for St Croix
        - Milltown fish passage was designed for alewife and salmon but not chad. Based on recent fish counts at Milltown, chad have been recently observed passing through the fishway; the first time since the 1980s. However, there is no information on the number of chad congregation below Milltown dam and unable to pass.
        - Shad haven't been observed in the river for several decades but evidence now suggests that the system might be able to support them. However, there is no information on potential

spawning habitat (e.g. locations, area, potential capacity, etc…). Understanding this information could help set a population goal as well as provide information in future design/re-design of fish passageways.

- A project proposal is being developed which Peskotomuhkati would like to submit to the IJC for funding support
- Current project cost $36K
- One time project
- Q: Is there historical evidence of Shad in river?
- A: Yes, archaeological research has found Shad bones in indigenous campfires;
- Q: Is there evidence of Shad in other adjacent rivers
- A: yes (e.g. Saint John, Kennebec, Peneboscot)
- Q: What time of year would survey need to be conducted?
- A: Best time would be immediately after ice-out; but fall is also possible and would avoid issues like cold temperatures and high water levels.

2) Atlantic Sturgeon

- Atlantic Sturgeon were historically present in the region but there is no information on the history, occurrence or habitat potential in the St Croix
- Sturgeon spawn in freshwater but spend most of their lives in salt water. However, they overwinter in marine water near river where they spawn
- A project proposal is being developed which Peskotomuhkati would like to submit to the IJC for funding support
- First Step 1 is to assess if sturgeon are present in Passamaquoddy Bay using side scan sonar to determine presence/absence
- Current project cost $54K
- Could lead to additional research (e.g. location of sandy bottoms, extent of salt wedge)

Discussion:

- Asha Ajmani knows that some studies have already been conducted on the local Sturgeon populations and suggests seeing if their studies have looked into this proposed survey.
- Additionally, Joe Zydelewski mentioned that the Sturgeon would likely not travel up the St. Croix River past Milltown and that the side scan system has been known to be a difficult tool to use with rock backdrops.

Fish Tracking Study (Asha Ajamani)

- Study conducted over the past 2 years
- Purpose of the study was to begin to assess fish ladder efficiency
- In 2016, 112 fish were tagged, and the trackers showed that there was a 75% rate of passage. In 2017, they tagged 384 fish but there was only a 47% passage through the Grand Falls Dam. This fishway typically loses fish after the first turn and takes all day for visually-guided fish to pass through. If they get too late a start, then the fish will turn back and possibly try again the next day. This year over 300 fish were tagged and passage rates are still being determined.

Food Web and Modelling Project (Joe Zydelewdki and Betsy Barber)

- The original project developed a population model that considered nutrient input to system
- The new project will take the technical model that was developed and create a user-friendly online application that managers could use to compare different scenarios. The model and application will

not provide predictive timelines but more about understanding the potential results of different management decisions on fish populations

- To ensure the online application is useful to end-users, the project leads are looking for involvement and input from potential users to better understand potential questions/scenarios that the application could address and to inform design of the application (i.e. user relevant end product)
- Action: Betsy Barber will reach out to stakeholders during application development for their input.

IWI Forest City Flows and Levels Study (Pam Lombard)

- Project results are now available and published on-line via USGS
- The purpose of the project was to estimate unregulated stream and lake levels and flows at Forest City dam. The project was developed as a result of Woodland Pulp's FERC surrender application in 2016 and the need for the IJC to better understand potential implications to its Orders at the dam
- The project was conducted in several steps:
    - Step 1 – data collection: survey of the dam and local topography around the dam (tied to USGS benchmark); survey of local bathymetry immediately upstream and downstream of dam; collection of edge data to tie together topography and bathymetry; estimate monthly mean flows and levels from the 40+ years of data collected at the ECCC station located just below Forest City dam
    - Step 2 –modelling; statistical regression equations were used to calculate historic flows in an unregulated situation. With calibrated hydrologic model, and regression equations, estimated flood flows were calculated and provided a comparison between historical observed regulated flow vs historical calculated unregulated flows. A calibrated hydraulic model was also used to estimate historic lake levels.
- Project caveats: results were only modelled for the area at or near the Forest City dam; did not include higher lake shore topography or bathymetry of the entire lake; only used average monthly water level and flow
- This study found that if the gates were to be opened and unregulated, the lake would drop by 1 to 5 feet throughout the year.
- Q: How many residents and homes are located around East Grand Lake?
  A: Over 1000 homes, cabins and docks
- Q: Did the USGS bathymetry survey locate the natural barrier that has been suggested to be located in the lake not far from the Forest City dam?
  A: Will have to look at side scan data again
- For the public meeting, the original catalyst, purpose and limitations of this study should be presented upfront to manage expectations on the findings.

FERC Licence Surrender – Forest City Dam (Jay Beaudoin, Barbara Blumeris)

- Last summer, the Maine State Legislature passed legislation stating that it will accept ownership of the Forest City dam if FERC determines that a FERC license would no longer be required
- Last fall, Woodland Pulp submitted a request for a Declaratory Order to determine if the state would require a FERC license. FERC issued a decision stating that if Maine assumed ownership of the dam it would still need to meet FERC license requirements.
- Woodland Pulp filed for rehearing on the Declaratory Order and FERC has agreed to look at it again; response has been delayed while waiting for the appointment of FERC Commissioners
- Board will continue to track FERC process.

SCIWC Water Quality Monitoring Project (Heather Almeda)

- In 1998-1999, an extensive water quality monitoring project sampled and assessed water quality at 88 different sites in river
- In 2017, the NB ETF supported a SCIWC project to recreate the original study and repeat water quality sampling at the same sites. The level of sampling effort was more modest with only 35 sites sampled
- In 2018, the NB ETF again supported a SCIWC project to continue water quality sampling. Another 15 sites will be added this year.

Water Quality Monitoring & Trends (Vince Mercier)

- This presentation provides an update on analysis of water quality data and trends for the St. Croix. The purpose is to see if there have been any recent changes or trends observed, particularly in light of recent water quality information presented in the 2016 and 2017 St. Croix Board Annual Report, as well as reports of algal blooms in the river last year.
- ECCC maintains two continuous water quality monitoring stations on the St. Croix - Forest City and Milltown. In addition, approximately eight grab samples are collected each year and analyzed for additional parameters
    - Forest City
        - Located in the upper watershed in a relatively undeveloped area.
        - Site is considered a reference or baseline site
        - CCME WQI is always excellent
        - Nutrient levels are typically low; 2-10 times better than downstream
        - Reanalysis of water quality data is showing some trends at Forest City
        - Sulphate levels down (coincides with emission reductions across North America)
        - Alkalinity levels are up (suggesting an increase in buffering capacity)
        - Total Organic Carbon levels have decreased slightly but include a strong seasonal effect (could be climate related or less contribution from wetlands?)
        - Fluorides are already quite low and still decreasing but have higher levels in winter (could be related to road salting?)
        - Sodium and magnesium are also decreasing (could be geologically related?)
        - Overall specific conductance (all ions) is also decreasing and is quite low.
    - Milltown
        - Located at the lower portion of the watershed (just above Milltown dam) so reflects inputs from upper watershed
        - Two years ago there was a shutdown at Woodland Pulp to address an effluent spill. Approximately 20-30 hours after the reported spill, the water quality monitoring station recorded an increase in conductivity. Subsequently, when facility shut down to conduct repairs, the water quality monitoring station recorded a significant decrease in conductivity. No exceedances were recorded but it was interesting to note that changes in the mill could be detected in conductivity.
        - A number of aluminum exceedances have been recorded, but increased aluminum levels are fairly common in Atlantic Canada and have not been considered to be an issue for aquatic life (it was noted that Woodland Pulp conducted a site specific study for salmon in 1996 and determined that most aluminum in the system was not bioavailable)
        - Cadmium is detected on occasion. Cadmium can bioaccumulate in the environment so it would be worth keeping an eye on it. It was noted that Woodland doing a site specific studies on cadmium and metals. Cadmium can be difficult to measure in water due to

detection limits at low concentrations. Woodland has been trying to identify potential sources so they can be addressed.
    - Phosphorus levels have also increased since 2015 (it was noted that Woodland conducts weekly phosphorus monitoring as a requirement from a European client)
    - Turbidity is generally linked to storms and soil/stream erosion. At the time of the last analysis no trends were noted, but a slight increasing trend was noted, particularly in last 2 years. It is possible that the recent increased turbidity levels could be linked to water levels and flows in summer season.
    - Nitrogen levels have also increased slightly. According to pollution release information and municipal wastewater information there hasn't been much change in effluent inputs so there may be other contributing factors. Other contributing factors might be the recent hot, dry summers or marine derived nutrients from the increase in alewife returning to the system
- It was also noted that the analysis was conducted using only ECCC data but there may be an opportunity to collaborate and share monitoring data to get a better sense of water quality conditions and trends in the St. Croix.
- Given some observations of localized algal blooms, additional monitoring to better understand algal conditions in river might we useful.

Overview of Current levels and Flows (Nick Stasulis)

- This presentation provides an overview of water levels and flows from this spring based on data collected by USGS stations at Baring and Vanceboro
- In general, spring peak stream flow is important. In 2018, peak flow was considered normal to a slightly above normal and occurred when expected (i.e. normal timing). In general, flows on the St. Croix tend to remain higher in the spring but data for this year shows a rapid decrease in flows to normal and then below normal.
- NOAA's meteorological data for this part of Maine show record high temperatures at the beginning of the month and above normal temperatures for much of the remainder of the month. For Bangor, it was the 13th hottest May in the 100 year period of record. Data also show a 2-3 inch precipitation deficit
- NOAA's summer seasonal forecast suggests a 50% change of temperatures being above normal (ECCC's forecast suggests a 60% change of temperature being above normal).
- Without significant precipitation, it is likely the low flow conditions will continue

Review of Orders

- Barbara Blumeris presented a table with the IJC and FERC rules and regulations that the dam operators must comply with (e.g. levels, flows, effluent dissolution). In addition, there are other water user interests and needs that the operators are also trying to voluntarily accommodate (e.g. property owners, recreational fishers, tourism, etc…).
- Operators are able to meet the IJC and FERC rules.
- Q: Does FERC monitor conditions? And what are consequences of non-compliance.
- A: Conditions and compliance is done through self-monitoring and reporting. Non-compliance with FERC can lead to fines, although there are a number of conditions which allow non-compliance (e.g. extreme event, emergency, risk to human life and safety…). FERC also provides the option to review requirements if they are not working.
- Currently system operated in compliance with requirements

- Discussion:
  - FERC and IJC are monitoring similar things…need to look at potential inconsistencies and a strategic plan Is there integration or prioritization of targets? What if targets conflict or meeting of one target results in another target not being met?
  - How do we incorporate a value/needs system for the watershed.
  - Are we setting up a system that is less resilient because there isn't flexibility to address climate/weather variability?
  - Stationary targets may not make sense under new climate regime – extremes, variability – and how to incorporate this new reality into the Orders. How can you bring/take into account climate variability into the Orders.
  - Is there a better way to manage the system or is the system managed pretty well already?
  - In light of climate change and climate variably, should the IJC be considering a new approach for its Orders (flexible vs stationary targets)? Are there additional studies necessary to better understand the implications of climate change?
  - The previous review of Orders was based on a target of 750cfs at Baring. Is this still relevant or appropriate?
- Action: Board to continue discussion at next Board call or meeting.

Adjorn