

**INTERNATIONAL ST. CROIX RIVER BOARD
ANNUAL REPORT
2001**

**ST. CROIX RIVER
MAINE AND NEW BRUNSWICK**

**2001 ANNUAL REPORT
of the
INTERNATIONAL ST. CROIX RIVER BOARD**

covering

The Orders of Approval with respect to the control of the discharge of the St. Croix River at Forest City, Vanceboro, and the water levels of East Grand Lake, Spednic Lake, Grand Falls Flowage and Milltown Dam Forebay.

The Water Quality and Aquatic Ecosystem for the St. Croix River Boundary Waters.

**SUBMITTED TO
THE INTERNATIONAL JOINT COMMISSION
APRIL 9, 2002**

**International St. Croix River Board
Membership as of December 2001**

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Board Members Appointments and Terms

Name	Appointment	Terms
Mr. Ken Hamilton	October 4, 2000	3-year term (two years as Chair of the Canadian Section)
Mr. Bill Appleby	October 4, 2000	3-year term
Mr. Bill Ayer	October 4, 2000	3 year term
Mr. Joe Arbour	August 16, 2001	no term currently specified
Colonel Brian Osterndorf	October 4, 2000	3-year term (two years as Chair of the U.S. Section)
Ray Thompson	October 4, 2000	3-year term - resigned July 25, 2001
Fred Kircheis	March 1, 2001	no term currently specified
Mr. Ed Logue	October 4, 2000	3-year term
Mr. Donald Porteous	October 21, 2001	3-year term
Mr. Robert Lent	October 21, 2001	3-year term

1.0 GENERAL

1.1 Board Membership

The current Board membership and secretariat as of December 2001 is provided at the front of this report. The Board membership changed during 2001 due the resignation of one US member and the addition of 4 new members, 3 from the US and 1 from Canada. The Appointments dates and terms are provided in the Table also at the front of the report.

1.2 Policy of the Board Regarding Dam Regulation

The Board continued its policy of leaving the regulation of the dams at Forest City, Vanceboro, Grand Falls, and Milltown in the owners' hands, exercising only that supervision necessary to ensure adherence to the requirements of the Commission's Orders.

During the reporting period, the Board reviewed conditions prevailing in the River by the following means: a continuous record of water elevations of East Grand Lake and continuous record of discharge below Forest City Dam; a continuous record of water elevations of Spednic Lake and a continuous record of discharge at Vanceboro; a continuous record of water levels above the Dam at Grand Falls; a continuous record of discharge at Woodland; and monthly reports received from NB Power indicating

daily forebay elevations obtained during regular work days at the Milltown Dam and details of changes in gate and stop log openings.

These data are reviewed in separate sections of this report and are summarized on Tables and Figures included as an Appendix to this report.

1.3 International Joint Commission Meetings

The Spring Semi-Annual Meeting of the International Joint Commission (IJC) was held from 3 April to 5 April 2001 in Washington, DC. Mr. Ray Thompson, US Section and the two Board secretaries attended the meeting. Mr. Ken Hamilton, Canadian Section Chair participated via telephone link. The Annual Report for 2000 was presented to the IJC.

1.4 Annual Public Meeting in Basin

A public meeting was held in the basin on the evening of 22 August 2001 in Washington County Technical College in Calais, Maine. The agenda included presentations by the St. Croix Board, Ms. Donna Adams of Domtar, Mr. Curtis Scott (a local canoe outfitter) and Dr. Fred Whoriskey on salmon aquaculture. Questions were asked by the public regarding the status of alewife blockage by Maine and the reasons for the decline of wild salmon.

1.5 Annual Inspection Tour of Facilities in the St. Croix River Basin

On 22-23 August 2001, the Board conducted its annual inspection tour of the facilities in the St. Croix River Basin, Maine and New Brunswick covered under IJC orders of approval. Inspections were performed on the Forest City dam and fish ladder; Vanceboro dam and fish ladder; Grand Falls Flowage dam and fish passages, Woodland Dam and fish passages and Milltown dam and fish passages. All facilities except for Milltown are owned and operated by Domtar Industries, Inc. The Milltown facility is owned and operated by the New Brunswick Power Company.

The individuals identified below attended the inspection tour:

Name	Position/Representing
Ms. Mary Gusella	Commissioner, IJC, Canadian Section
Mr. Rudy Koop	Engineering Advisor, IJC, Canadian Section
Ms. Lisa Bourget	Engineering Advisor, IJC, Canadian Section
Mr. Ken Hamilton	Chair, St Croix Board, Canadian Section
Mr. Bill Appleby	Member, St. Croix Board, Canadian Section
Mr. Bill Ayer	Member, St. Croix Board, Canadian Section

Mr. Paul Noseworthy	Environment Canada
Col. Brian E. Osterndorf	Chair, St. Croix Board, US Section
Mr. Ed Logue	Member, St Croix Board, US Section
Ms. Barbara Blumeris	Secretary, St. Croix Board, US Section
Ms. Donna Adams	Domtar Industries, Inc.
Mr. Michael Footer	Domtar Industries, Inc.
Mr. Larry Doyle	Domtar Industries, Inc.
Ms. Gaile Nicholson	Domtar Industries, Inc.
Mr. James Provencher	Domtar Industries, Inc.
Mr. Brad Kelso	Domtar Industries, Inc.
Mr. Jeff Babcock	New Brunswick Power Co.
Mr. Glen Hanson	New Brunswick Power Co.

A narrative description of the facilities visited and the results of the inspection are included as an Appendix to this report.

1.6 Board Meetings

The Board held two Board meetings during 2001. One was on 25 June 2001 at the US Army Corps of Engineers, New England District office in Concord, Massachusetts. The second was in Calais, Maine on 2 November 2001. Items discussed at these meetings included: the alewife passage issue; the two on-going Board studies; planning for the Science Workshop on the St Croix River; Board membership, the status of the EPA flow requirements at the Baring gage; security issues at the dams; and status of the public sewage treatment plant upgrades. The November meeting also included three presentations to the Board. Presenters were 1) Lee Sochasky of the International Water Resources Commission on the current water resource, land use, and fisheries issues and activities in the watershed; 2) Mark Bader and Art MacKay Saint Croix Estuary Project on trends in the estuary; and 3) staff from Kleinschmidt Associates on methodologies for assessing instream flow requirements for fish and wildlife habitat.

2.0 MANAGEMENT OF THE WATER LEVELS AND FLOWS

In 2001, the yearly mean water level at East Grand Lake was 131.511 metres (431.27 feet), which is slightly lower than the long term mean value of 131.793 metres (432.39 feet).

The annual mean flow from the lake at Forest City Stream was 3.80 m³/s (134 cfs), 39 % less than the long term mean value of 6.19 m³/s (218 cfs).

The average water level for the year at Spednic Lake was 115.446 metres (378.76 feet) and is below the long term mean value of 116.302 metres (381.57 feet).

The yearly mean flow as recorded at Vanceboro was 12.8 m³/s (452 cfs), 37% less than the long term mean of 20.3 m³/s (717 cfs).

The annual mean flow at Baring was 38.2 m³/s (1350 cfs), which is less than 47% of the long term mean at Baring of 71.7 m³/s (2530 cfs).

2.1 East Grand Lake Reservoir and Discharges below Forest City Dam

During the period from 1 January to 31 December, the reservoir was operated between a maximum daily mean of 132.084 metres (433.35 feet) on 7 June, and a minimum daily mean of 130.934 metres (429.57 feet) on 24 December. The maximum lake level as prescribed by the Commission's Order is 132.571 metres (434.94 feet); the minimum is 130.438 metres (427.94 feet). The Order was maintained throughout the year. The daily mean elevations are presented in Table I and Figure I of the Appendix A.

Table II and Figure II of the Appendix presents the daily mean discharges below the Forest City Dam at the outlet of East Grand Lake for 2001. The maximum daily mean for the reporting period was 13.9 m³/s (491 cfs) on 29 August and the minimum daily mean was 2.14 m³/s (75.6 cfs) on 25 November. The mean discharge for the year was 3.80 m³/s (134 cfs). The Commission's Order of a minimum discharge of 2.12 m³/s (75 cfs) was maintained throughout the year with the exception of a 7 hour period on December 16 starting at approximately midnight when shell ice restricted flow at the gate to the outlet of East Grand Lake. This caused the flows at Forest City Stream to recede below the required minimum flow. Once Domtar staff were aware that a low flow condition was apparent, Dam tending personnel were quickly dispatched to the site to address the problem. Flow was restored at approximately 07:45 AM. A memo was released on December 17 by Domtar personnel to the Board and IJC, acknowledging this incident. According to Domtar staff, the data logger alarm did not activate as it should have therefore there was no warning that flows were approaching the minimum discharge value. Environment Canada staff tested and confirmed the operation of the alarm limits on December 18, 2001. There was no apparent problem with the logger. The graph in Figure VIII of the Appendix depicts the water levels during this incident. The minimum water level reached was 130.626 metres (428.56 ft.) which relates to a flow of 2.06 m³/s (72.7 cfs). The graph in Figure VIII of the Appendix depicts the water levels during this incident.

2.2 Spednic Lake Reservoir and Discharges Below The Vanceboro Dam

During the year, levels in the reservoir ranged from a maximum daily mean of 116.762 metres (383.08 feet) on 18 June, to a minimum daily mean of 113.979 metres (373.94 feet) on 31 December. The maximum limit specified in the Commission's

Order is 117.610 metres (385.86 feet). The minimum allowable level is 113.233 metres (371.50 feet) for the period of 1 October to 30 April inclusive, and 114.757 metres (376.50 feet) for the period of 1 May to 30 September inclusive. The Order was maintained throughout the year.

The daily mean elevations for the Spednic Lake Reservoir during the year are presented in Table III and depicted in Figure III of the Appendix A.

The maximum daily mean discharge recorded from the outflow at the reservoir at Vanceboro was 26.3 m³/s (929 cfs) on 1 September and the minimum daily mean recorded was 6.09 m³/s (215 cfs), on 18 April. The Commission's Order of a minimum flow of 5.66 m³/s (200 cfs) was maintained throughout the year.

Daily mean discharges are presented in Table IV and depicted in Figure IV of the Appendix.

2.3 Water Levels above Grand Falls Dam

Table V of the Appendix and Figure V include a list of the water level elevations of the headpond of the Grand Falls Dam for the report period. The recorded maximum daily mean elevation was 61.956 metres (203.27 feet) on 3 May and the minimum recorded elevation was 61.425 metres (201.53 feet) on 9 April.

The maximum prescribed elevation of 62.106 metres (203.76 feet) (adjusted), as set by the Commission, was not exceeded at any time during the year.

2.4 Discharges at Baring, Maine

Table VI of the Appendix A and Figure VI show the daily mean discharges of the St. Croix River at Baring, Maine. The mean discharge for the report period was 38.2 m³/s (1350 cfs). The maximum daily mean was 311 m³/s (10,980 cfs) on 26 April. The minimum daily mean was 21.9 m³/s (773 cfs) on 31 December. This discharge is above the minimum flow requirement of 21.2 m³/s (750 cfs) as stipulated by State of Maine's, Department of Environmental Protection.

2.5 Headwater Elevations above NB Power Corp. Milltown Dam

Table VII and Figure VII of the Appendix presents and depicts daily water elevations in the forebay of The NB Power Corporation plant at Milltown, New Brunswick. These elevations refer to mean sea level datum. As daily observations of elevation are not obtained on holidays or weekends, maximum and minimum daily mean water levels are not quoted in this report.

2.6 Findings

The International St. Croix River Board found that the operators of the control facilities in the St. Croix River Basin, Domtar Industries, Inc. and NB Power, operated in 2001 within the Orders of Approval established by the International Joint Commission. On December 17, 2001 the flow below Forest City Dam dipped below the required minimum release of 75 cfs for about 7 hours. This was due to the formation of shell ice that restricted the flow of water. Domtar went to the site and corrected the problem.

2.7 Extreme Low Water Levels

The northeastern part of Maine and southeastern NB have been experiencing drought conditions over the past several years. The year 2001 was reported to be the driest on record for that region since 1894. An analysis carried out for precipitation in summer (June - August) and autumn (Sept - Nov) indicates amounts of only 50-60 % of normal. Precipitation in the spring season was also below normal (55% of normal at Saint John, NB). The April - November precipitation for the last 53 years (measured at Saint John, NB) shows that 2001 is the second driest April to November period. The driest was in 1997 while 2000 ranked fourth. Figures 1 and 2 indicate cumulative precipitation for 2001 and annual precipitation since 1962 at Penfield, NB.

This drought has resulted in very low water levels in Spednic Lake, the lowest seen in recent history according to local residents. During this time, the lake level retreated to what was essentially the original stream bed, leaving some fish stranded and cottage wharves many meters from the nearest water. The Board is concerned about the impact these low water levels in the lakes and River are having on the residents of the basin and on the health of the aquatic ecosystem both upstream in the lakes and downstream. There have been adjustments made to the levels and flows this year, although not specifically at Spednic Lake. The requirement by Maine to maintain a 750 cfs flow rate at the Baring gage has been reduced to 500 cfs. This has in effect provided some relief to Spednic Lake by reducing the demand for flow releases at Vanceboro Dam as it is a big contributor to the flow at Baring. Minimum flow requirements at Forest City and Vanceboro dams have, however, not been reduced and minimum or close to minimum flows have been maintained over the late winter months.

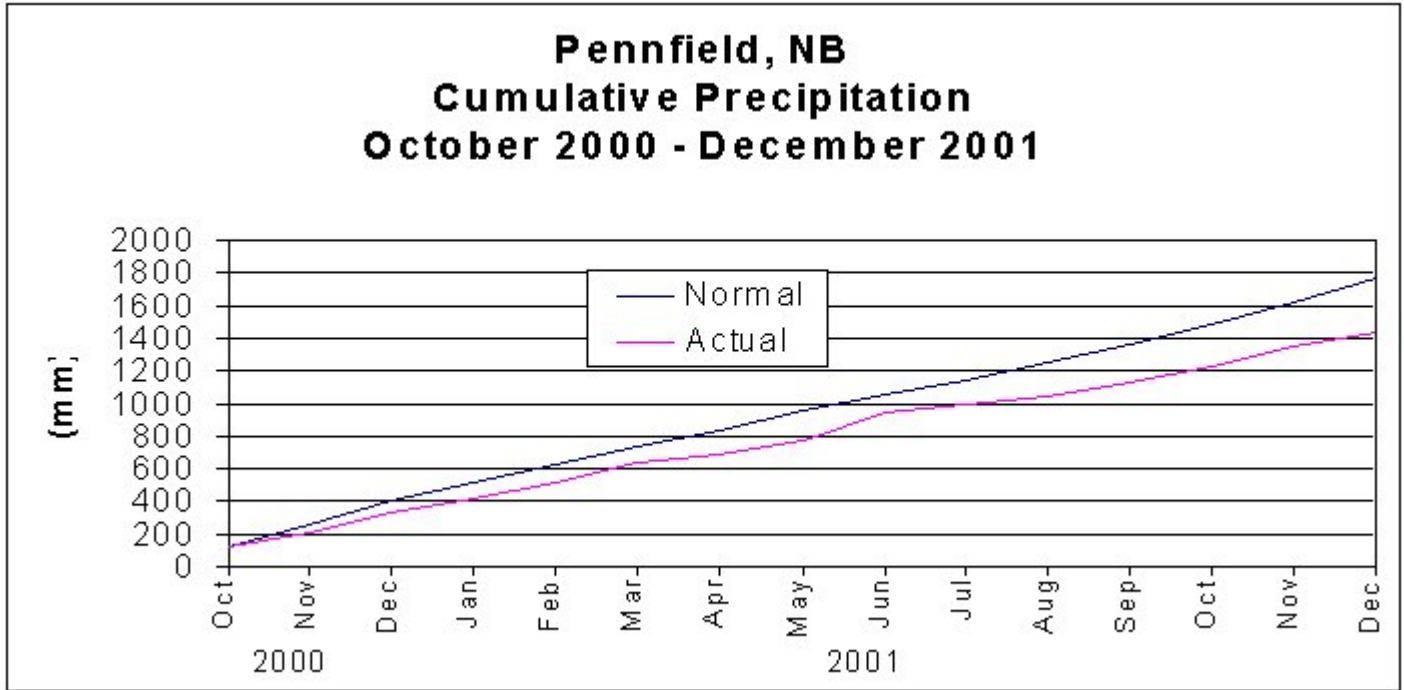


Figure 1

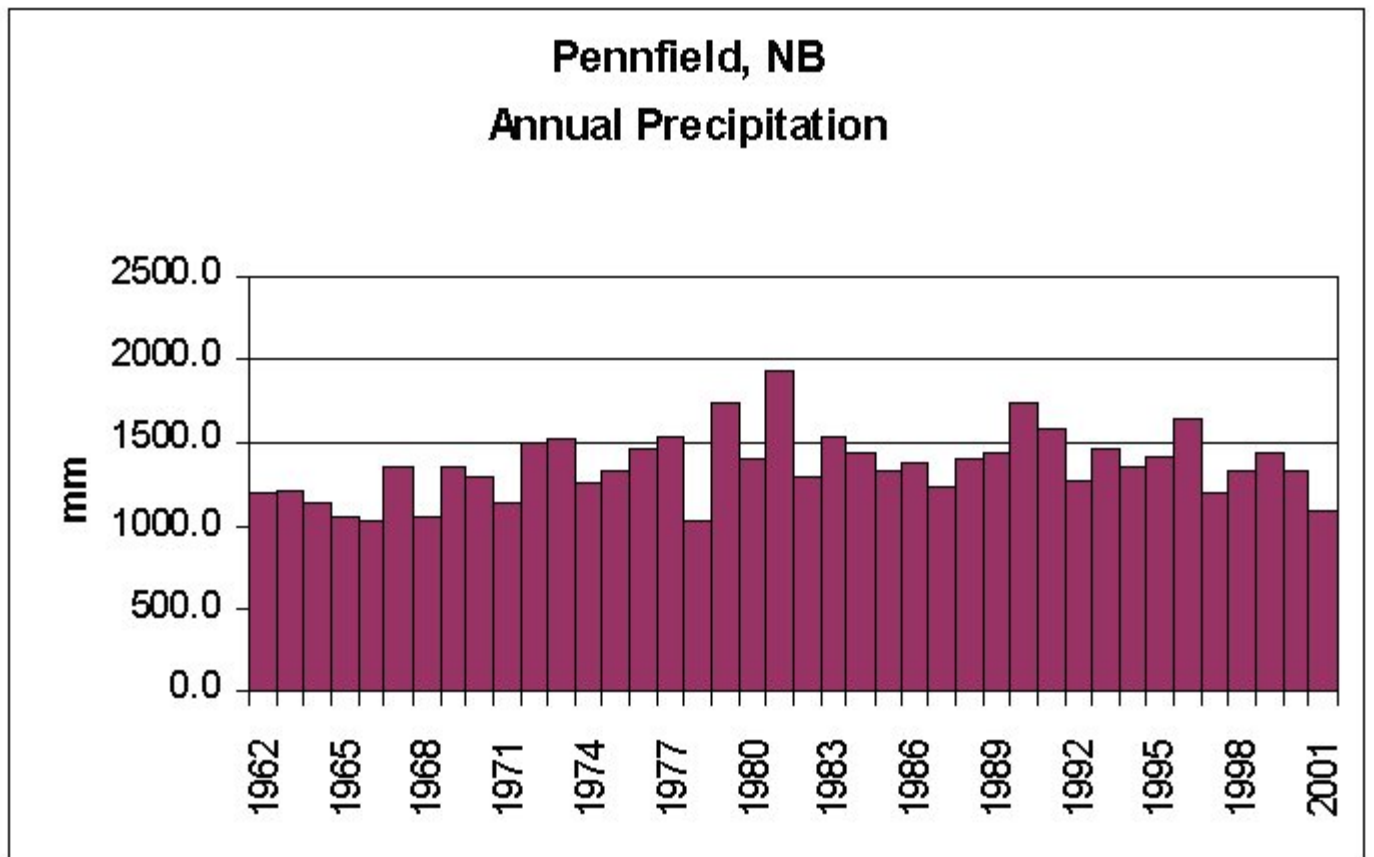


Figure 2

Residents of MacAdam and other communities around the Spednic Lake area of New Brunswick and Maine have been greatly concerned over low water levels in the lake and other parts of the St. Croix River basin. They have expressed their concerns to government authorities, Domtar who is the owner and operator of the dams in the area and the IJC.

This spring Domtar has indicated to the public that they plan to manage the system to increase water levels in the lakes while maintaining the minimum flow requirements. On 8 March 2002 Spednic Lake was at 28.81 percent of full; this was up from 16.15 percent of full on 2 January 2002. This increase is due to the recent rain and snow melting in the basin.

The St. Croix River Board is studying the problem in order to provide advice on what action might be taken to relieve the situation in Spednic Lake. The IJC, the state of Maine and the U.S. Federal Energy Regulatory Commission (FERC) have regulatory responsibilities over water levels and flows in the waterway which are aimed at balancing minimum flows with optimum lake levels and healthy ecosystems as well as preventing flooding from the usual snow-melt and spring rains. The Board is working with the various State, Provincial and federal agencies as well as Domtar to determine what adjustments might be made to address the problem.

At the request of the Board, fisheries and aquatic scientists, hydrologists, meteorologists and water managers from agencies in Canada and the U.S. are considering the feasibility of short term relief to the low lake levels. The Board, along with others, will be developing a plan for managing the system to help protect lake levels should the drought conditions persist. Without rain, very little can be done in the short term other than maintaining communication with those in the Basin. In the long term, however, there may be water management options which could better balance the system and still provide suitable protection to the fisheries and other upstream and downstream resources. The Board will advise the IJC concerning any such options prior to the critical time for water management decisions in late summer and fall 2002.

These studies and concerns over drought and low levels will be discussed during the spring and summer Board meetings and public meetings in the basin and at the IJC workshop on the St. Croix River planned for St. Andrews, NB, in November.

3.0 WATER QUALITY

Water quality objectives for the St. Croix River were met in the summer of 2001. All readings were well within the extreme values for the period of daily record at the Milltown monitor. The maximum dissolved oxygen value recorded was 9.5 mg/l on July 27; the minimum dissolved oxygen value recorded was 6.1 mg/l on July 1 and August 11.

Table 1: St. Croix River at Milltown, Station # 01021050
Water-Quality Monitor, June – September, 2001

	June	July	August	September
Dissolved Oxygen (mg/l)				
IJC objective = 5.0 mg/l minimum				
Maximum	9.3	9.5	8.7	8.1
Minimum	6.5	6.1	6.1	6.2
Mean	7.8	7.7	6.9	7.1
Water Temperature (degrees centigrade)				
Maximum	27.0	26.1	26.9	23.8
Minimum	15.1	19.7	20.8	15.2
Mean	21.1	22.5	24.2	19.7
pH (standard units)				
Maximum	7.0	7.1	7.1	7.2
Minimum	6.6	6.7	6.6	6.8
Mean	6.7	6.9	6.9	7.0

The St. Croix International Waterway Commission continues to be instrumental in monitoring water quality in the basin. Water quality sampling in the lower river has been used by New Brunswick and Maine in discussions on the future classification of the section of the River between Woodland and Milltown. Monitoring results suggest that this section of the River is Class B status under Maine's current system and New Brunswick's proposed system. The Board is pleased to see the emergence of a common classification system for the River most recently supported by the passage of classification regulations by the New Brunswick legislature on March 1, 2002. The St. Croix International Waterway Commission carried out pre-classification work over the past year in support of the province's adopting the classification system.

Bacteriological monitoring in the estuary in the vicinity of Oak Bay indicates that the controls achieved over contamination from bacteria are still in effect and a conditional opening of Oak Bay for commercial shellfish harvesting is still in existence. Strong efforts over the past several years by the St. Croix International Waterway

Commission, SCEP and others to address this contamination problem through education and on-site remediation are to be commended.

4.0 STATUS OF POLLUTION ABATEMENT

4.1 Maine

The Calais sewage treatment plant (STP) has not been well operated over the past year or so. A consent agreement was levied in 1997 for lack of reporting. Subsequent testing by the Maine DEP found other irregularities which finally resulted in charges being laid against the operator of the plant. The Board was advised, and is satisfied, that it was unlikely that serious contamination of the river had occurred. The Board has been assured that the plant will receive increased attention from the Maine DEP in the future.

A consent agreement with G-P, arising from past spills at the Woodland plant, resulted in money being provided to the International Waterway Commission to conduct work on the River. This seems to be a preferred way for dealing with pollution offenses since it provides badly needed resources to local organizations for studies or work on locally important environmental issues.

4.2 New Brunswick

The STP at St. Stephen reported serious upsets during the past summer resulting in odiferous conditions and potential threats of direct discharge of raw sewage to the St. Croix River. The town is high on the Provincial list to receive infrastructure funding from a federal infrastructure program in Canada to construct a new facility. The Board considered the advisability of contacting the Environment and Local Government Minister for the Province of New Brunswick to promote the need for a new plant in view of the international implications of potential contamination of the St. Croix River resulting from problems with the current plant. No such contact was made formally, however, working contacts through Board members provided sufficient opportunity for this matter to be well aired at senior levels in the New Brunswick government.

5.0 FISHERIES

5.1 Alewife

The impasse on the blockage of alewife migration in the St. Croix River still persists.

The Board provided a report on this situation to the IJC in June 2001 and asked that the matter be addressed with the two governments (See Appendix B). The Board, in hindsight, discussed the role it played, or could have played, in this matter through the hearings over the new legislation to reverse the fishway closures last summer, and other communications it had, or could have had, with the State. From an ecosystem perspective, the Board still supports the management plan that would restore alewives to the river.

In late 2000/early 2001, a management plan was developed by the St. Croix Fisheries Steering Committee, comprised of representatives of the U.S. Fish and Wildlife Service, Canadian Department of Fisheries and Oceans (DFO), State of Maine Dept. of Inland Fisheries and Wildlife, State of Maine Department of Marine Resources, State of Maine Atlantic Salmon Commission, and Province of New Brunswick Department of Natural Resources and Energy. The management plan (MOU) for alewives and smallmouth bass would permit controlled access of alewives (4 fish per surface acre) through the Grand Falls dam. Although senior officials of all agencies agreed to the plan, a Bill which was submitted to the Maine Legislature to rescind the 1995 Legislation did not pass. Failure of the Bill was attributed to a strong lobby from a group of stakeholders (guides) in the upper River system determined to defeat the Bill in the interest of a lucrative smallmouth bass sport fishery in Spednic and East Grand Lakes which they claim to be in conflict with the presence of alewives. Their arguments are not well supported from a scientific or ecological perspective.

In 2001 the number of returning alewives had dropped to 5202 from a sustained average migrating population in the early 1990's of 338,000.

DFO upheld its stated position to truck alewives from Milltown to release points upriver of Grand Falls should the Bill fail. Approximately 3000 alewives were trucked in a three week period during May 2001 at the peak of the alewife run.

In a letter dated October 9, 2001, to the State of Maine from the US Fish and Wildlife it was stated that unless the fishways were returned to their original function by spring, 2003, they would withhold the \$2.4M which the State receives annually for recreational fisheries research and development.

5.2 Landlocked Alewives

Concern is growing over the growth and spread of landlocked alewives throughout the upper part of the basin. This species competes with native landlocked smelt for habitat and has altered the diet of larger sport fish. It may be that the absence of sea-run alewives has provided them a selective advantage. Sport fishermen and freshwater

biologists are concerned about this displacement and plan to study its impact on other fish species.

5.3 Atlantic Salmon

Returns of Atlantic salmon remain low. In 2001 there were a total of 25 native salmon (primarily progeny of from the restoration program) and 52 aquaculture escapees recovered at the Milltown counting station. The 52 non-native fish were removed for agency research, while the native fish were collected as broodstock for the River's restoration program. The number of aquaculture escapees was higher than the average 25 - 30 fish in recent years. This is a major concern of fisheries biologists who fear that inter-breeding of native and aquaculture fish will dilute the gene pool of native fish with unknown consequences for the future survivability of the species in the wild.

In 2001 the St. Croix River became a pilot site for a U.S. salmon restoration experiment using stocked adult salmon rather than the traditional juvenile releases. Many of the 780 released in October 2000 remained in the river over winter and left for the ocean in May-June. A final release took place in fall 2001 and is under study.

6.0 STUDIES

6.1 Environmental Trends in the St Croix Estuary Study

This overall project, which is being undertaken by the St. Croix Estuary Project, is a two year effort started in 2001. The portion of the work which was funded by the IJC, and contracted to SCEP through Environment Canada, includes monitoring and sample collection along several underwater transects in the St. Croix estuary at the same locations as a 1970 study. Water chemistry data is also being collected at stations throughout the estuary. Current work will document changes and allow an evaluation of any trends which seem to have taken place over the past 30 years. SCEP is also using an underwater video camera to document benthic conditions and help with the analysis and interpretation of data.

Data collected in this work will be compiled in a data base which is being developed for the study and will connect with other work that is going on among agencies and other organizations in the basin. An interim report was provided to the Board by SCEP in November and a final report on the segment of the study funded by the Board will be available in April.

6.2 Sewage Treatment Plant Protocols Study

Work on an Operations and Performance Survey of Sewage Treatment Plants in the St. Croix River was carried out in mid-October, 2001 by CPO Inc. of Burlington, Ontario. The survey focused on four plants at Milltown, St. Stephen, NB and Bangor and Baileyville in Maine. This project was part of the workplan funded by the IJC and carried out under contract to Environment Canada under the supervision of Dr. Peter Eaton. Involved in the survey along with CPO Inc. were staff of the Maine Department of Pollution Prevention and the NB Department of Environment and Local Government as well as operators at each of the plants.

In addition to documenting and verifying effluent quality from the four plants and assessing operational practices, the study identified differences in operating protocols, reporting procedures, management pressures, monitoring practices and other areas which could affect water quality in the river or the ability of the agencies to manage emergencies and other upsets or developments concerning STPs. The exercise served as a valuable learning opportunity for the Maine DEP and NB DELG staff. A final report will be provided to the Board in March 2002. The study will be recommending improved data gathering and reporting, particularly in NB, and the development of specific procedures for contingency sludge disposal at Calais among other recommendations aimed at improving the operation of all of the plants studied.

The following table shows the status of the three projects and the dispersment of funds provided by the IJC:

<i>Project Name</i>	<i>Project Allocation - IJC</i>	<i>Expenditures to date - IJC & others</i>	<i>Report Status</i>
Sewage Treatment Plant Study	\$10,000 (U.S.)	\$10,000	final report received
Estuary Study Board provided part of funding for 2 year SCEP project	\$15,000 (U.S.)	\$15,000 IJC \$120,000 (DFO, Huntsman, NB ETF, IWC, ACAP and other partners)	interim report pending - April Final completion April 2003
Science Workshop (to be held in November 2002)	\$20,000 (U.S.)	no expenditures	

Table 2

7.0 OTHER ISSUES:

7.1 Bayside Port Expansion

The Board conducted a review of a planned expansion of the Port at Bayside which involves infilling into the St. Croix River. Measures being taken to protect potential impacts on the River were reviewed as were any changes this project might bring to the adjacent rock quarry operation. The rock quarry operation has been a source of complaint from Canadian and U.S. residents over the past several years. New Brunswick has requested more stringent monitoring of emissions and effluents from the quarry under a new certificate of operation. The certification process invites comments on the conditions at the Port from stakeholders and an assessment of operations through the New Brunswick Department of Environment and Local Government. The Board is monitoring this process closely.

7.2 Land Use

The protected area strategy currently under consideration by the Province of New Brunswick will protect approximately one quarter of the land on the NB side of the upper basin. A management plan for some of these lands is under review with the intention of designating sections adjacent to the St. Croix waterway under the province's new Protected Areas Program. Considerations being taken include the economic needs of local communities and other local interests.

On the U.S. side of the St. Croix waterway Wagner Timber Partners now control ownership of original Georgia-Pacific Corp. lands. There is an effort underway by the State of Maine and others to acquire a 500 ft waterfront corridor along part of Spednic Lake and nearly all of the upper St. Croix River. Significant funding is expected from the state's Land for Maine's Future Program. Another group, Friends of the Downeast Lakes, are in discussion with Wagner for protection of additional waterfrontage on West Grand Lake. Similar negotiations will likely be directed to protecting lands on East Grand Lake and Grand Falls Flowage. The Board is highly supportive of these efforts and intends to convey its views to the relevant agencies in both New Brunswick and Maine.

Of note are two recent land acquisitions which have placed critical shoreline sites under protected status. These are the Clarks Point Nature Reserve above St. Stephen and Tod's Point below Oak Bay, both on the Canadian side. Devils Head, on the U.S. side of the River across from the Bayside Port, is under serious consideration by the State of Maine for protective legislation.

APPENDIX A

CONVERSION EQUATIONS AND SIGNIFICANT FIGURES

Cubic metres per second x 35.315 = cubic feet per second

Metres x 3.2808 = feet

Water discharge - cubic metres per second reported to 3 significant figures but not more than three decimal places.

Water levels - observations made to nearest 0.002 metre and are referred to mean sea level datum.

Water levels - publications and computations quoted to nearest 0.001 metre and are referred to mean sea level datum.

ORDERS OF APPROVAL **INTERNATIONAL JOINT COMMISSION**

9 November, 1915-	For approval of a dam and power canal and the obstruction, diversion and use of the waters of the St. Croix River at Grand Falls in the State of Maine and the Province of New Brunswick: Maximum elevation 202.0 feet m.s.l.
3 October, 1923-	Erection and repairs of fishways in the St. Croix River.
6 October, 1931-	For the obstructions of the waters of the St. Croix River at Grand Falls in the State of Maine and the Province of New Brunswick. Increase in elevation to 203.5 feet m.s.l.
2 October, 1934-	For the reconstruction of a dam across the St. Croix River from Milltown in the Province of New Brunswick to Milltown in the State of Maine.
15 October, 1965-	For the construction of a storage dam in the St. Croix River at Vanceboro, Maine and St. Croix, New Brunswick:
Discharge from Spednic Lake-	200 cfs (5.66 m ³ /s) minimum
Elevation of Spednic Lake-	385.86 feet (117.611 metres) maximum
Between 1 October and 30 April-	371.50 feet (113.233 metres) minimum
Between 1 May and 30 September-	376.50 feet (114.759 metres) minimum
Discharge from East Grand Lake-	75 cfs (2.12 m ³ /s) minimum
Elevation of East Grand Lake-	434.94 feet (132.571 metres) maximum 427.94 feet (130.438 metres) minimum
16 November, 1982-	For the reconstruction of the diversion dike in the St. Croix River near Baileyville, Maine.

**Inspection of IJC Regulated Facilities
21-22 August 2001**

FOREST CITY DAM & FISH LADDER

General

The Forest City Dam is a small timber crib rock filled dam with three (3) wooden sluice gates that are operated utilizing a wooden ratchet lever system that lifts the gates by a steel cable or steel chain. The three gates have an opening of 8'-4" (2.54 m) and a sill elevation of 427.94 feet (130.44 m) NGVD. Full pond elevation is at elevation 434.94 feet (132.57 m) NGVD, and impounds 105,300 acre-feet (0.130 km³) of water. The fishway is located on the left side (facing downstream) of the dam and consists of timber baffle system with a timber trash rack upstream. There is a gauging station located immediately downstream on the right bank that measures information regarding stage which, through the use of a rating table can be converted to determine discharge from East Grand Lake. There is also a gauging station upstream to measure the East Grand Lake water level.

Inspection Comments

During the time of the inspection the reservoir elevation was at elevation 432.48 feet (131.823 m). This represents a reservoir drawn down approximately 2.46 feet from the maximum pool level of 434.94 feet, and approximately 4.54 feet above the minimum authorized lake level of 427.94 feet. East Grand Lake was approximately 65 percent full. The number 1 and 2 sluice gates were in the closed position. Sluice gate 3 was opened 54 inches. The discharge at the time of the inspection was approximately 291 cfs.

The timber structures of the dam, the gates and fish passage facility appear to be in good condition. As noted in past inspections there was still a tilting of the left section of the timber cribbing and the fish passage facility. The tilting appears to be the result of settling or other soil action at the left section of the timber crib dam and fish passage area. Domtar agreed to monitor this by surveying the existing conditions this year and re-surveying next year to determine any movement. Domtar refurbished the crib and ballast at the dam in 2000.

Both the upstream and downstream gages were inspected and found to be in proper working order.

Conclusion

The facility is in good condition. GP will continue to monitor the dam in regard to any movement of the left abutment near the fishway.

VANCEBORO DAM & FISH LADDER

General

The Vanceboro dam consists of a concrete gate structure and earth embankment with rock filled gabions in the upstream face. The concrete structure is 69 feet (21 m) long, containing a fishway and two taintor gates, each 22'-6" (6.9 m) wide by 14'-6" (4.4 m) high. The gates are operated electrically utilizing cable lifts. The gate structure is located on the International Boundary line between the United States and Canada. The gate sill elevation is at 371.5 feet (113.23 m) NGVD. Normal full pond elevation is at 385.86 feet (117.61 m), with an impounded surface of 20,870 acres (84.5 km²). There are approximately 221,200 acre-feet (0.27 km³) of useable storage at normal full pond. The fishway is located on the left side of the dam and consists of 10 bays or pools and has 5 vertical lift wooden gates to regulate flow through the ladder. The trash rack on the upstream face of the fish passage consists of steel bars spaced approximately 1 foot in the horizontal direction and 3 feet in the vertical.

Inspection Comments

During the time of the inspection, Spednic Lake, controlled by the Vanceboro Dam, was at an elevation of 380.43 feet (115.956 m) which is approximately 5.43 feet below the maximum pool elevation of 385.86 feet and 8.91 feet above the minimum pool level of 371.52 feet. Spednic Lake was approximately 62.21 percent full. The two taintor gates were opened 12.0 inches each and a discharge of approximately 770 cfs was being released.

The facility appeared to be in good condition and the taintor gates are operational. In 2001 Domtar upgraded the electrical at the facility and performed minor maintenance work on the earth embankment. Minor seepage was observed in a construction joint at the fish passage facility. Domtar will add to maintenance list. The lake level gage was inspected and found to be operational.

Conclusion: The Vanceboro facility is in good condition.

GRAND FALLS FLOWAGE DAM & PASSAGE FACILITIES

General

The Grand Falls Flowage Dam located approximately 8 miles upstream of the town of Baileyville, Maine, controls the water that drains from the west branch of the St. Croix River and can store approximately 88,000 acre-feet of water. The Grand Falls Flowage Dam has 9 steel taintor gates located on the right of the spillway and a concrete emergency spillway approximately 800-850 feet in length running from the concrete gatehouse and ending at the left shoreline. The gatehouse used to operate the gates is located between the gates and the emergency spillway. The spillway has 113 wooden flashboard sections that increase the pool height approximately 6-8 feet. The spillway area is equipped with a bubbler system to reduce the effects of ice on the flashboards and spillway. The entire upstream length of the spillway can be inspected via a floating walkway. There is a gauging station that records the Grand Falls Lake level located on the right bank of the dam.

The downstream face of the emergency spillway/dam consists of a concrete face sloping downstream at an angle of approximately 45 degrees supported by concrete buttresses along its length. Between these buttresses are bays with a space between the face of the dam/spillway and the supporting buttresses that has been enclosed by a pressure treated timber log system. G-P has experienced spalling/cracking of the concrete of the downstream face due to the temperature differential between the water face and the exposed downstream face of the dam. This log system was installed to attempt to minimize this temperature differential in the downstream face area during freezing conditions to reduce possible degradation of the concrete face. The downstream face of the dam/spillway may be examined via an elevated walkway located between the dam face and the log system.

The fish passage facilities at Grand Falls are located in the area around the Domtar hydroelectric generating plant. Water is impounded behind Grand Falls Flowage Dam and delivered to the hydroelectric plant and fish passage facilities via a channel that is located on the right side of the impoundment pool approximately 1000 feet upstream of the impoundment dam.

The water to the turbines flows via three steel penstocks (two of which have surge tanks). The downstream passage facilities are located on the right of the hydroelectric plant (looking in a downstream direction). The downstream passage facility consists of a steel V-shaped flume supported on metal cradles. The upstream fish passage facilities are located on the left of the hydro plant and consist of a series of concrete pools or bays that allow the fish to slowly passage upstream. The bays are equipped with guide slots that allow for the installation of pressure treated lumber frames to direct the flow from one bay to the next away from the bay walls. This frame system assists in limiting the passage of undesirable aquatic species.

Inspection Comments

At the time of the inspection, the pool level behind the Grand Falls Dam was approximately 196.630 feet (59.93 m), which is approximately 6.87 feet below the maximum pool level of 203.50 feet. This pool level is about 66.00 percent of full pool condition. During the inspection, the downstream flow was approximately 1,039 cfs. All of the taintor gates were in the closed position. The gage that measures the pool level behind the Grand Falls dam was inspected and found to be operating properly.

The downstream face of the facility was viewed and a great deal of cracking, spalling and delamination of the gunite layer on downstream face was notes as in prior years. It should be noted that this gunite layer provides a wearing surface and is not considered a structural element of the facility. On the left abutment area there was a U-shaped spalled area 6-inches deep with exposed rebar. Reinforcing bars were also exposed on the downstream face along several of the bays. Maintenance of these areas should be considered in future repair work by GP.

On the interior inspection, several of the bays showed spalling and seepage, mainly through construction joints. Minor seepage was observed in several of the Bays. It should be noted that spalling and minor seepage is common in facilities of this age, particularly in the severe climatic conditions the facility endures. Periodic inspections and maintenance by Domtar can be used to identify and correct spalled areas and seepage through construction joints. Repair items can then be scheduled during normal maintenance work at the facility. Domtar indicated that Klienschmidt Associates was scheduled to provide a periodic inspection of the facility in 2001.

The upstream and downstream fish passage facilities were also viewed and no significant repair issues were noted.

The gauging station that records the level of the Grand Falls pool was inspected and found to be operating properly.

Conclusion

The facility is in satisfactory condition although several possible rehabilitation and maintenance items were noticed.

MILLTOWN DAM & FISH PASSAGE FACILITIES

General

The Milltown facility is located in Milltown, New Brunswick across the river from Calais, Maine and approximately one mile upstream from the international bridge between Calais and St. Stephen, New Brunswick. The facility consists of a

powerhouse with 7 hydroelectric generating units, an upstream fish passage facility that goes from the lower pool around the left side of the powerhouse to the upper pool. The emergency spillway is located to the right of the powerhouse and has 6 openings that have large wooden stoplogs that can be removed or installed via a railed vertical lifting mechanism. Other sections of the emergency spillway have been equipped with wooden stoplogs that will fail during periods of high stage. At the far end of the emergency spillway running perpendicular from the spillway to the right bank is a gatehouse with 5 vertical lift wooden gates used to control the forebay elevation. A wooden chute downstream fish passage facility is located in the area between the spillway and the gatehouse.

Inspection Comments

The Board examined the concrete crack in the interior of the powerhouse running the length of the powerhouse in front (downstream) of turbines 5-7 and up the brick wall separating unit 5 and unit 4. NB power continues to monitor the movement of the downstream wall of the powerhouse at units 5 to 7 to determine when and if remediation will be required

NB continues to work on the repair of the external brickwork on the powerhouse. NB indicated they plan to complete work on the power house brick work in 2003.

The Board observed seepage through the stone blocks in the downstream wall of the powerhouse. This seepage had been observed in 1999. NB indicated that they have asked their engineering consultant to take a look at this and report back on any required maintenance.

As in past inspections, extensive spalling of concrete was observed to the concrete piers of the spillway. The spalling in the bottom area of these piers has exposed the steel reinforcing of the piers. The New Brunswick Power (NB) representative indicated that there are no immediate plans to take any corrective action regarding the spalling of concrete piers, but is included in maintenance plan for 2005/2006.

The Board inspected the gate house floor slab. There was spalling and exposed rebar noted in several locations. NB indicated some repair work would be done in 2002.

During the inspection the upstream and downstream fish passage facilities were also viewed and appeared to be in satisfactory condition.

Conclusion

Although there is no evidence to suggest that the spalling and cracking of the piers of the Milltown spillway and the spillway section poses an immediate problem, it does allow water penetration and will accelerate deterioration of the concrete and reinforcing steel. It is assumed that NB Power will, as indicated by its representative, continue to monitor the cracking situation in the powerhouse and determine the source of the discharge from the foundation. It is also considered prudent that New Brunswick Power identify a strategy and timetable to address the engineering and repair needs of the facility.

APPENDIX: B

Alewife Legislation in Maine A Report to the IJC from the International St. Croix River Board, June 6, 2001

The International St. Croix River Board has been monitoring the situation between Canadian and US interests over the blockage of alewives on the St. Croix River. Since Maine blocked their passage by law in 1995, the Board has actively sought compromise and resolution among the various agencies and organizations over this issue in the interest of maintaining balanced and healthy river and estuarine ecosystems. This report is prepared in response to the recent rejection of a bill by the Maine State Legislature to reverse the original legislation and allow alewives to pass up the River and will provide the IJC with background and advice.

Background:

- In 1995, the State of Maine passed a law entitled “An Act to Stop the Alewives Restoration Program in the St. Croix River”.
- The law requires State of Maine personnel to block the passage of alewives in fishways built on the U.S. side of trans-boundary dams at Woodland and Grand Falls dams. (Fish passage at Milltown, the lowest dam on the river, is unimpeded because the fishway is on the Canadian side of the river.)

- Federal governments of the United States and Canada were not consulted prior to the time the law was enacted.
- Runs of alewives to the Milltown Dam on the St. Croix River were more than 600,000 fish in 1996 and less than 9,000 fish in 2000, less than 1.5 percent of what they were in 1996.
- The Board has attempted to understand all aspects of this issue by meeting with various stakeholders, studying the ecological implications of the alewife population and seeking the advice of fisheries specialists.
- The loss of alewives to the system will eliminate an important food source for other aquatic and terrestrial species in the River and associated marine receiving waters. The dynamics of the alewives in the upper lakes and their threat to the viability of the small mouth bass population and the associate sport fishery is less well understood and not fully substantiated from a scientific point of view.
- The St. Croix Fisheries Steering Committee, comprised of representatives of the US Fish and Wildlife Service, Canadian Department of Fisheries and Oceans (DFO), State of Maine Dept. of Inland Fisheries and Wildlife, State of Maine Department of Marine Resources, State of Maine Atlantic Salmon Commission, and Province of New Brunswick Department of Natural Resources and Energy developed a management plan (MOU) for alewives and smallmouth bass in 2000 that would permit controlled access of alewives (4 fish per surface acre) through Grand Falls dam.
- Senior officials of all agencies, excepting the Commissioners of both the Maine Department of Marine Resources and Maine Department of Inland Fisheries and Wildlife, signed the MOU by mid February, 2001. The Maine Commissioners were consenting parties to the MOU, but, because the bill was before the legislature, the Maine commissioners could not sign the MOU.
- On January 29 or 30, 2001, the Maine Department of Inland Fisheries and Wildlife and Maine Department of Marine Resources drafted and submitted a Bill to the Maine Legislature to rescind the 1995 Legislation.
- The Board supported the bill and the adoption of the management plan in a letter sent to the commissioners of the Maine Department of Inland Fisheries and Wildlife and the Maine Department of Marine Resources.
- The Bill was referred to the Standing Legislative Committees on Marine Resources and the Inland Fisheries and Wildlife who met jointly to develop a recommendation for the legislature on whether or not to approve the Bill.
- There was a strong lobby from a group of stakeholders (guides) in the upper River system to defeat the bill in the interest of their lucrative smallmouth bass sport fishery in Spednic and East Grand Lakes.
- DFO stated its position to truck alewives from Milltown to release points upriver of Grand Falls” in writing (and at the public hearing) to the State of

Maine Commissioners with copy to the respective chairs of the Standing Committees should the legislation not pass.

- The Joint Standing Committee conducted a public hearing in Augusta on March, 12, 2001 which was attended by Board members.
- On May 3 the Joint standing Committees voted on an amended bill (LD365) 9 for, 7 against and 8 absent and later polled (result not known).
- On May 16 the Maine Legislature's House of Representatives voted 97-42 to defeat the bill and thereby reaffirm its 1995 closure of state controlled fishways to spawning alewives.
- Later on the 16th the Senate voted in favor of the bill, and returned it to the House for a possible compromise solution.
- On May 17, the House again defeated the bill by a large majority thereby ensuring the continuation of the 1995 closure of Maine controlled fishways to the passage of alewives.

Current Status:

DFO have started trucking alewives from the Milltown dam to above the dam at Woodland. So far approximately 3,000 fish have been transported above the dam. This constitutes about 60% of the total run which, prior to the blockage numbered over 1.6 million. The area above Woodland, but below the Grand Falls dam increases the habitat from 0.1 % of the total watershed habitat to 5 % and will allow a minimal population of alewives to breed and populate that section of the river pending possible future resolution of the blockage. DFO are interested in pressing their dissatisfaction over the situation with governments and the IJC. The Board has been approached by the DFO requesting advice on how to initiate further involvement of the IJC and how to raise the issue to higher levels in the governments of Canada and the U.S. Media attention over the trucking of alewives has been strong.

The U.S. Fish and Wildlife Department are well apprised of the situation in Maine with the failure of the legislation and are waiting for the Legislature to close before taking any action. It is possible that they will seek reimbursement from the State for the cost of the fishways which, because of the blockage, are not being operated according to the original agreement between USF&W and the state of Maine. They are also considering the withholding of funds to the State usually provided on an annual basis for fisheries research and management. This amounts to approximately \$2M. Further consideration of these options will be taking place over the next several weeks.

The Board has been asked by the IJC to provide them with a report on the situation and advice on options and approaches for resolving the dispute.

Advice to IJC Ottawa and Washington:

Further advice may be available from the Board after a meeting planned for June 25 in Boston where this issue will be given additional consideration. At this time the Board would like to suggest that the IJC undertake the following:

- Consider ways in which the IJC might mediate this disputed issue should a request come from governments.
- Advise Canadian Department of Foreign Affairs and International Trade (DFAIT) and U.S. State Department of the situation and of the request which has come to the International St. Croix River Board from DFO for government advice and IJC intervention.
- Provide the International St. Croix River Board with advice on how it is to deal with media enquiries concerning the IJC position on this issue and action which it deems suitable at this time.