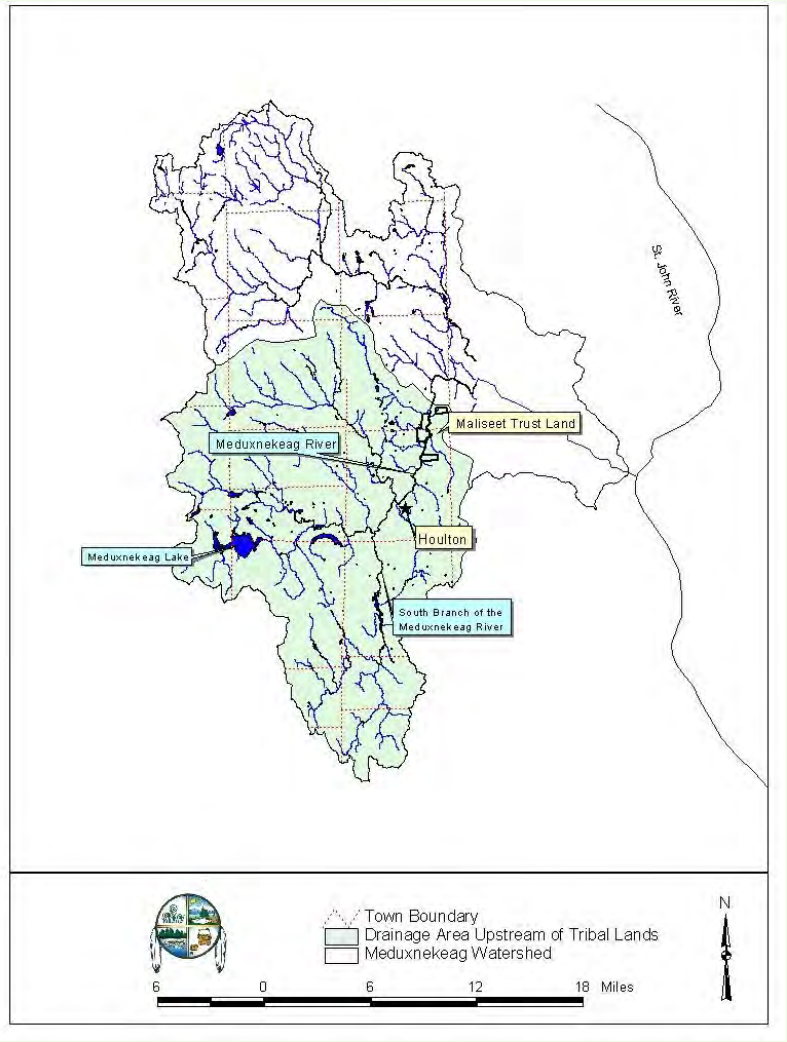
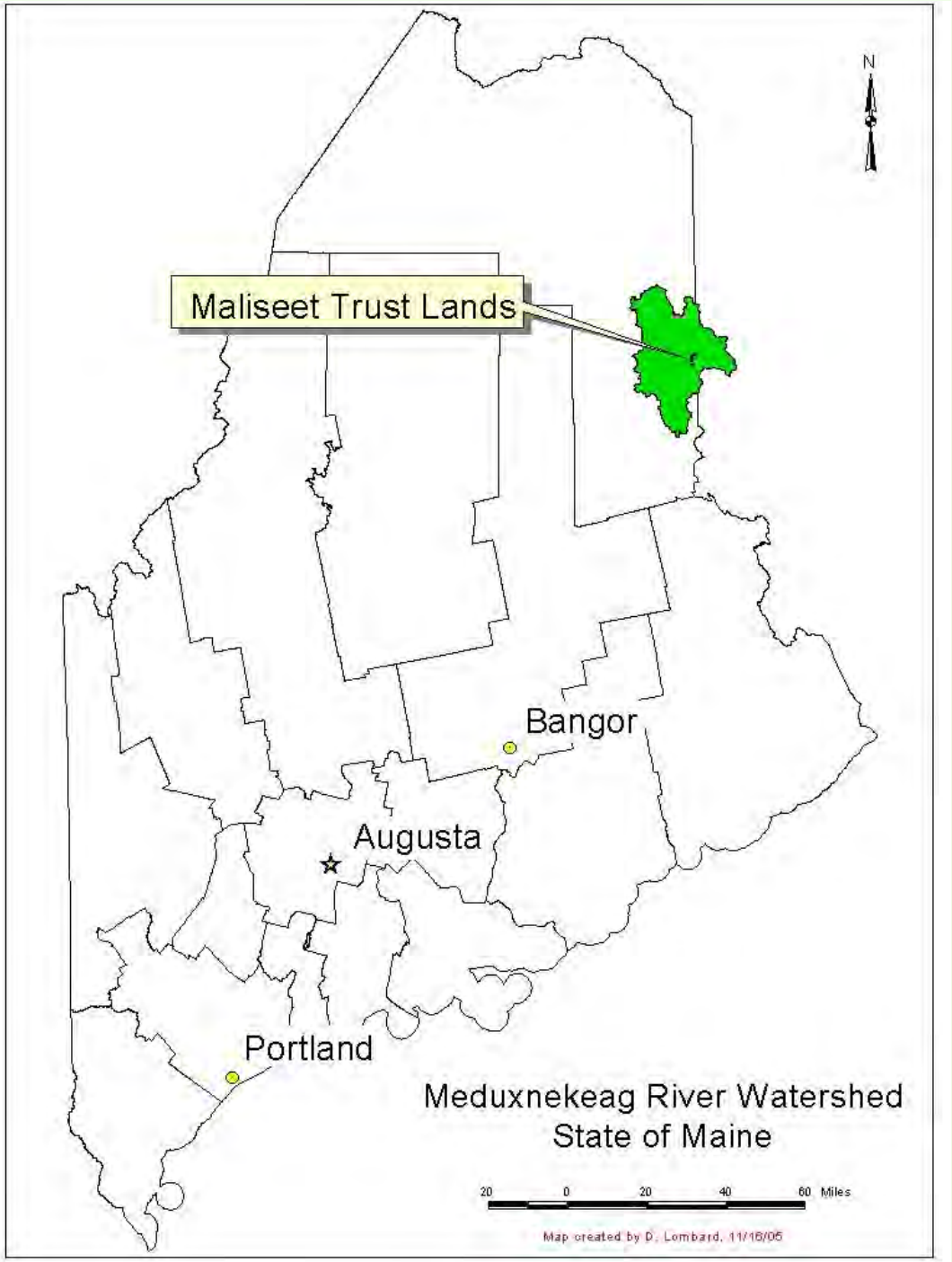
Living Downstream (& Upstream)

Houlton Band of Maliseet Indians

Metahksonikewiyik - People of the Meduxnekeag

Partnering to Protect tribal Resources in a watershed context – 20+ Years

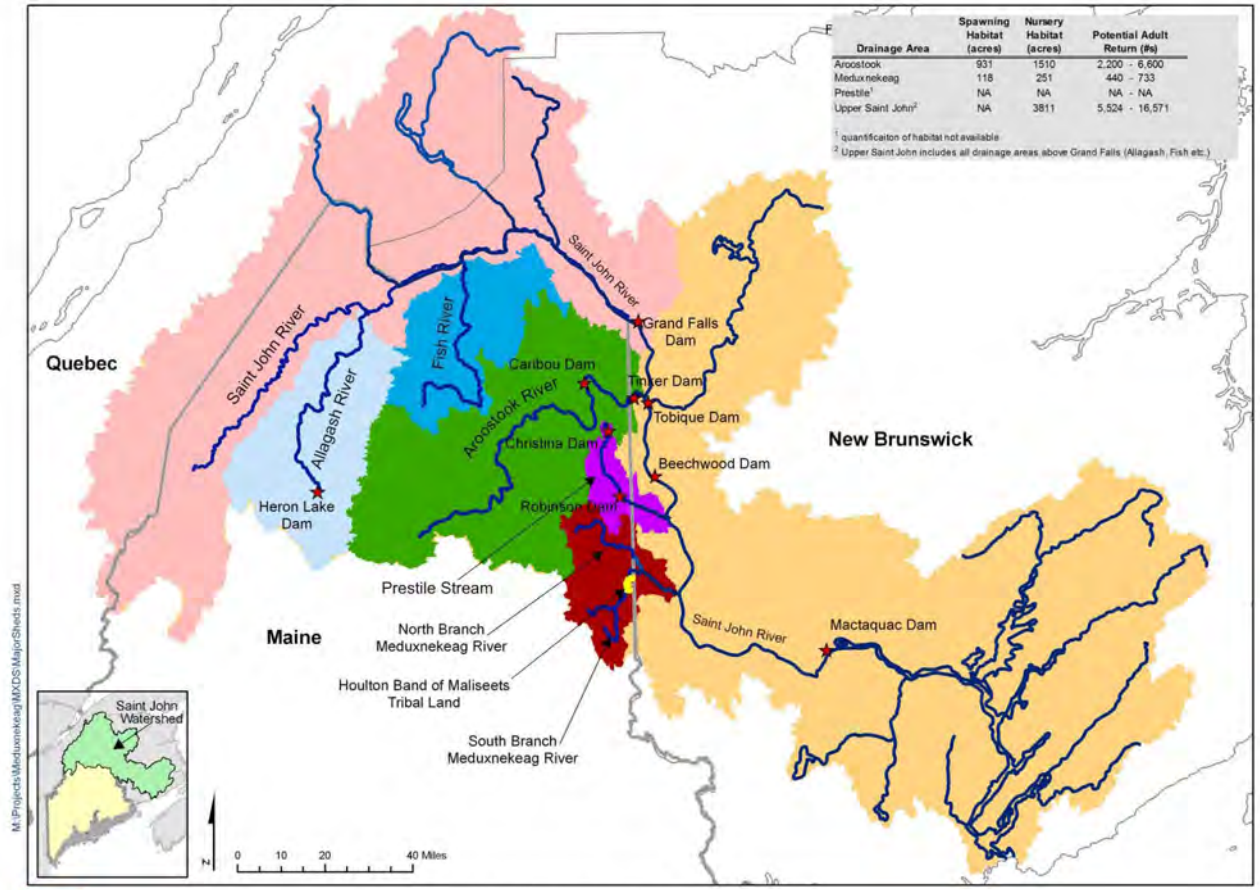



N
Maliseet Trust Lands
Bangor
Augusta
Portland
Meduxnekeag River Watershed
State of Maine
20 0 20 40 60 Miles
Map created by D. Lombard, 11/16/05


Houlton Band of
Maliseet Indians
2½

Wolastoqewiyik

"People of the Beautiful, Flowing River"



Major US Triburtaries of the Saint John River and Potential Atlantic Salmon Return

Figure 3. Major Tributaries and Potential Salmon Returns in the Saint John River Watershed.

Houlton Band of Maliseet Indians

And

The Meduxnekeag River

THREATS: Waste Water Dischargers

Municipal Waste Water Treatment Plant

Starch Factory

THREATS: Agriculture

E. Coli Bacteria

Soil, Chemical Fertilizers & Pesticides

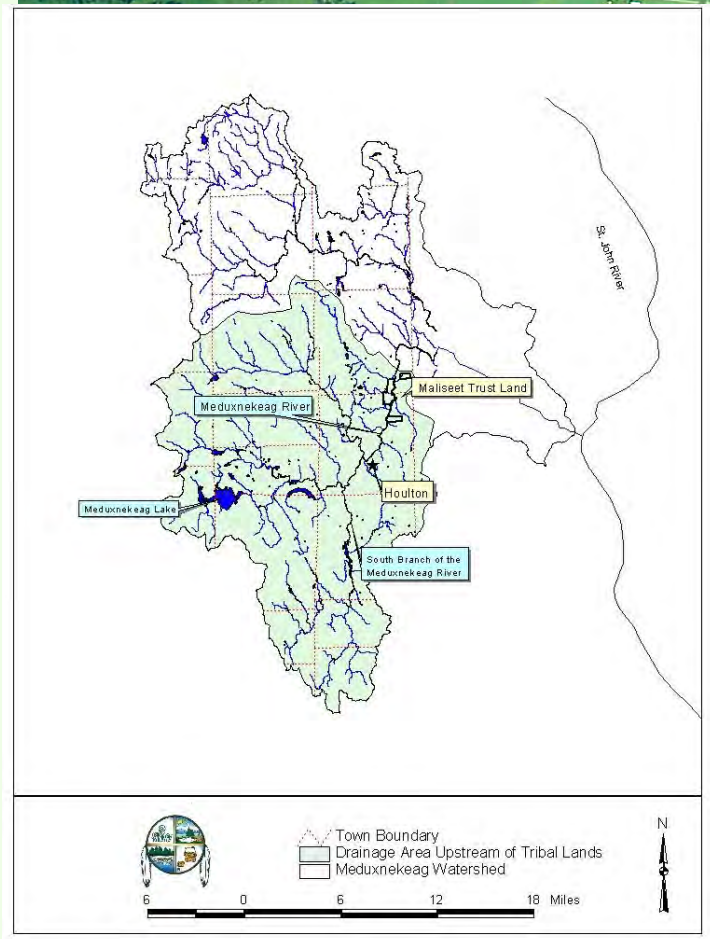
THREATS: Urban Stormwater

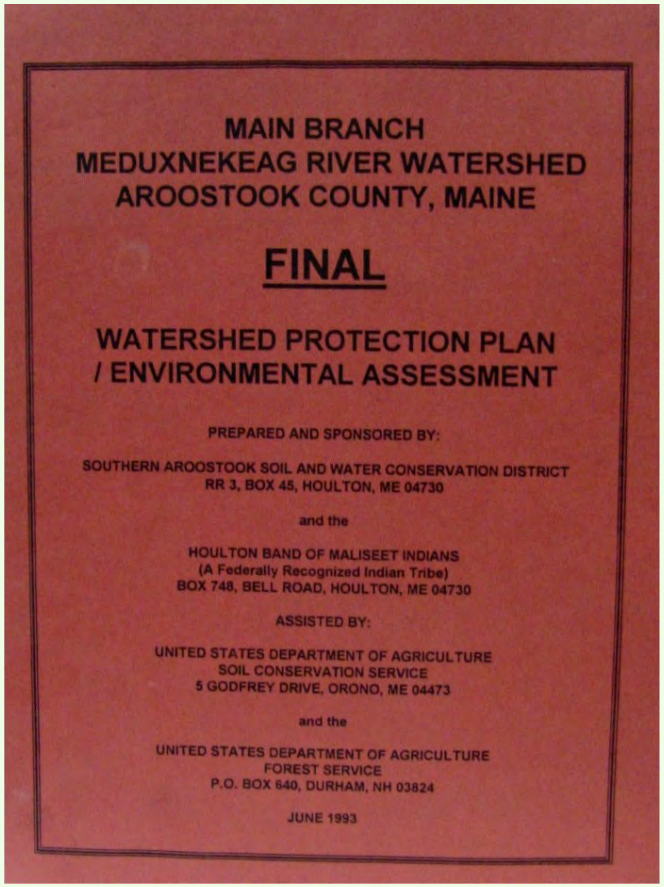
Water Quality Impairments:

algae, bacteria, sediment, pesticides, low Dissolved Oxygen

Partnering to Protect Tribal Resources in a Watershed Context

- Become a model land owner
- Communicate our land management successes
- Collect and share environmental data
- Work with the watershed community
- Bring financial resources to watershed-level protection/management activities




MAIN BRANCH
MEDUXNEKEAG RIVER WATERSHED
AROOSTOOK COUNTY, MAINE

FINAL

WATERSHED PROTECTION PLAN
/ ENVIRONMENTAL ASSESSMENT

PREPARED AND SPONSORED BY:

SOUTHERN AROOSTOOK SOIL AND WATER CONSERVATION DISTRICT
RR 3, BOX 45, HOULTON, ME 04730

and the

HOULTON BAND OF MALISEET INDIANS
(A Federally Recognized Indian Tribe)
BOX 748, BELL ROAD, HOULTON, ME 04730

ASSISTED BY:

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
5 GODFREY DRIVE, ORONO, ME 04473

and the

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
P.O. BOX 640, DURHAM, NH 03824

JUNE 1993

Drainage area @ 289 sq. miles.
Land use : 146,200 acs forested,
23,900 acs active cropland,
3,900 acs in hay and pasture,
3,000 acs grassland,
8,000 acs urban land or water.

TREE PLANTING ALONG the RIVER

HBMI PLANT MATERIALS CENTER - ongoing

Streamco Willow, Bankers Willow, Red Osier Dogwood

Water Quality Monitoring

Monitoring pH, temp., e.coli, conductivity, alkalinity, total nitrogen & phosphorus, aquatic insects

Collecting and Sharing Environmental Data

- Document water quality problems
- Advocate for stronger water quality standards
- Demonstrate need for stricter discharge limits
- Support higher water quality classification

Working with the Watershed Community

Bringing financial resources to the watershed

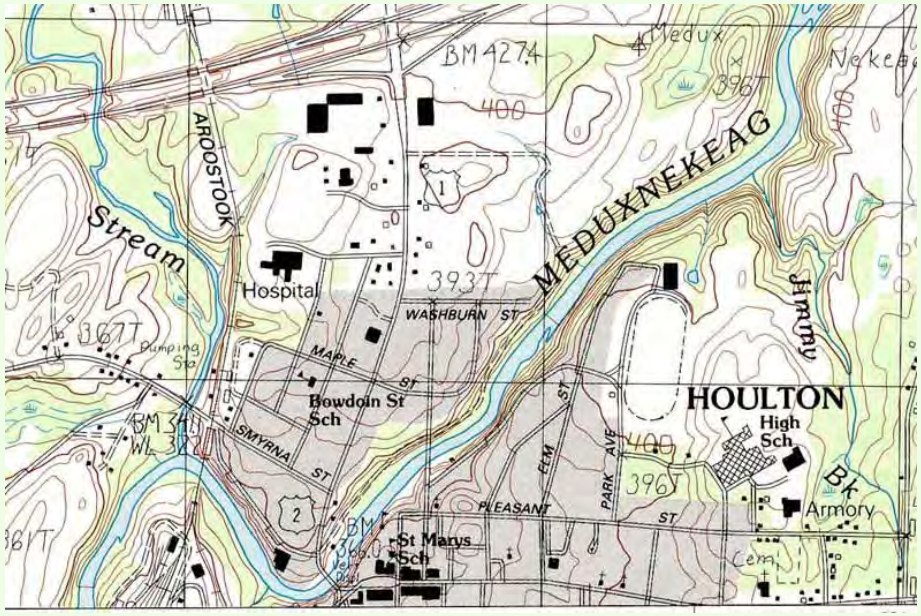
$868,835 over 20 years

- $10,000 road construction and maintenance workshop
- $15,000 forest management and harvesting practices workshop
- $16,000 cattle exclusion and watering demonstration project
- $19,500 manure management survey
- $569,449 agricultural conservation practices/illicit sewer connections removal
- $89,560 storm water management project at local Civic Center
- $149,326 Pearce Brook watershed-based plan and storm water management project

Alternative Grazing and Watering Demonstration Project– Pollution Prevention $

Winter Cover Project – Targeted Watershed $

Erosion Control Project at Municipal Civic Center - CWA319 $



Pearce Brook Watershed Based Plan & Stormwater BMPs

Water Quality Problems

Sediment from eroding stream banks, road ditches, sidewalks, driveways, and bridge embankments.

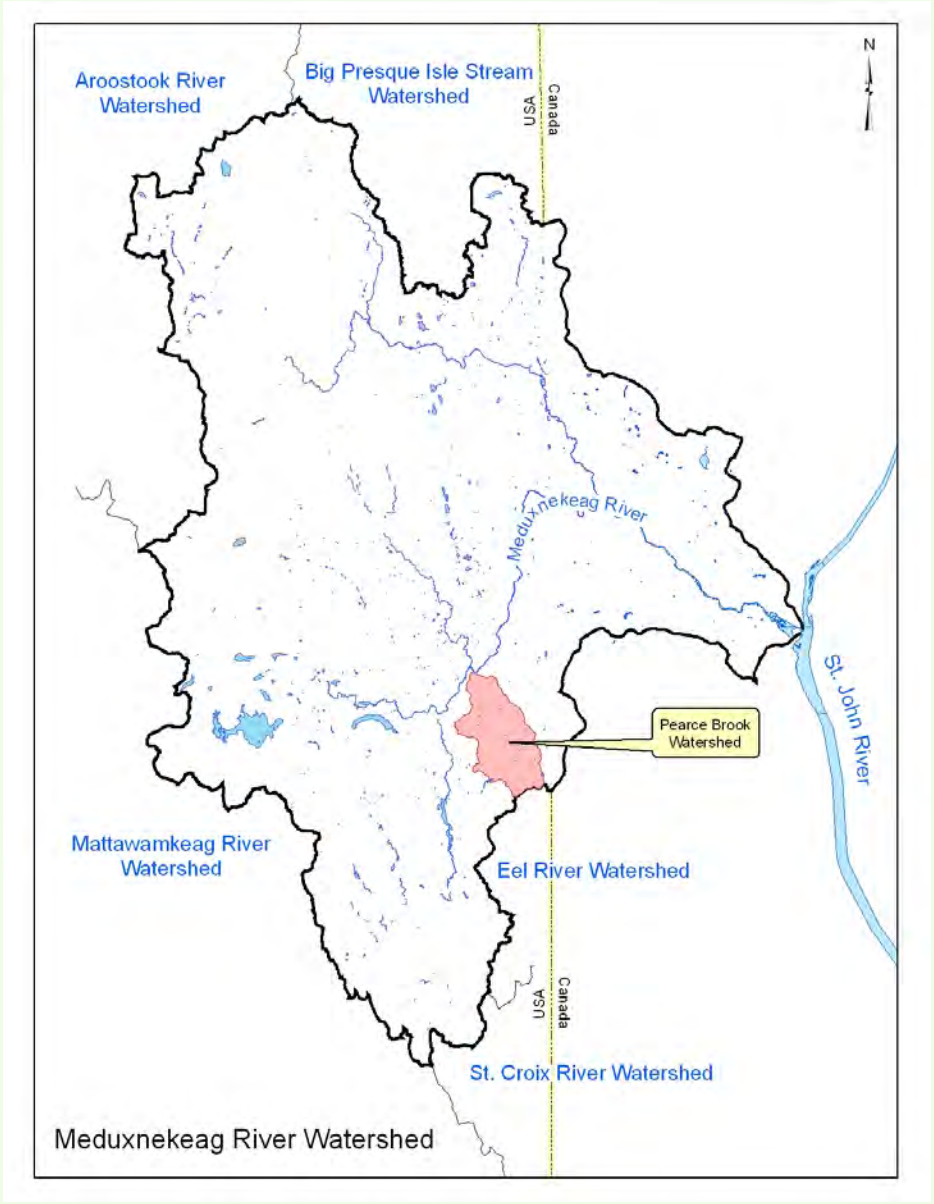
Conductivity (a measure of pollutant load) exceeds the range of all other tributaries in the Meduxnekeag except Jimmy Brook, and increases dramatically after Pearce flows through its urbanized stretch.

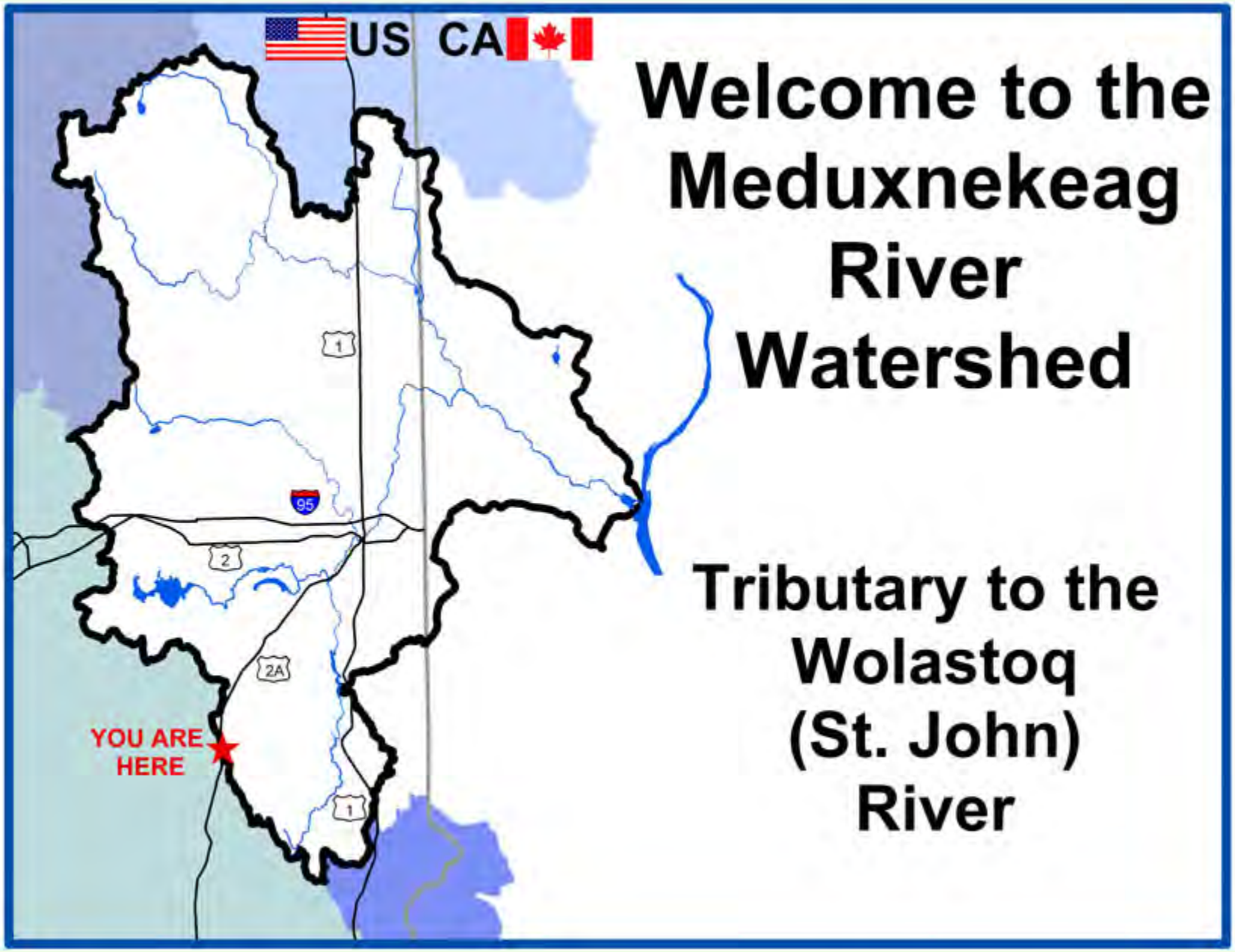
Bacteria above natural background levels, and commonly exceed state standards.- found at high levels in storm drains.

Dissolved Oxygen impairments in the lower watershed.

Aquatic Invertebrates at Class B levels, other tributaries attain a higher standard (Class A).

Fuel Contamination a historical legacy of over 30 underground gas/fuel storage tanks.




US
CA
Welcome to the Meduxnekeag River Watershed
Tributary to the Wolastoq (St. John) River
YOU ARE HERE
1
95
2
2A
1


METAHKSONIKEK ~ MEDUCTXNICOOK ~ MEDUCTSINICICK ~ MEDUCKSINIKECK ~ MEDUCTXNICK ~ MADUCTSINICIK
Exploring the Meduxnekeag Watershed
Map Legend
Rivers and Lakes
Wetland Areas
Forested areas
Agricultural Areas
Watershed Borders
Political Borders
Roads
Houlton Band of Maliseet Indians
Woodstock First Nation
Miles
Kilometers
Changes in the Watershed:
Settlements, Dams, Logging & Natural Influences
~MEDUXNIKICK ~MADUCXSNIKIC ~MADUCKSNEKIC ~MADUCKSNEKICK ~MEDUXNAKEAG ~MEDUXNIKEAG ~MEDUXNIKEEK

Research & Assessment

Sediment Study (Pesticides & Nutrients)

Bacterial Source Tracking

Nutrient & Sediment Loading

Toxins in Fish (Dioxin, DDT, Hg, et.al)

Watershed Modeling – what challenges will Climate Change bring?

THE TEMPORAL AND SPATIAL RELATIONSHIP BETWEEN PHOSPHORUS AND NITROGEN CONCENTRATIONS, ALGAL GROWTH, AND NUTRIENT SOURCES IN THE MEDUXNEKEAG RIVER WATERSHED

By

Elizabeth A. Fretwell

B.S. Virginia Tech, 2000

A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

(in Ecology and Environmental Sciences)

The Graduate School

The University of Maine

May, 2006

Advisory Committee:

D. Bryan Dail, Assistant Professor Soil Microbiology, Co-Advisor

Katherine E. Webster, Assistant Professor of Biological Sciences, Co-Advisor

Susan H. Brawley, Professor of Plant Biology

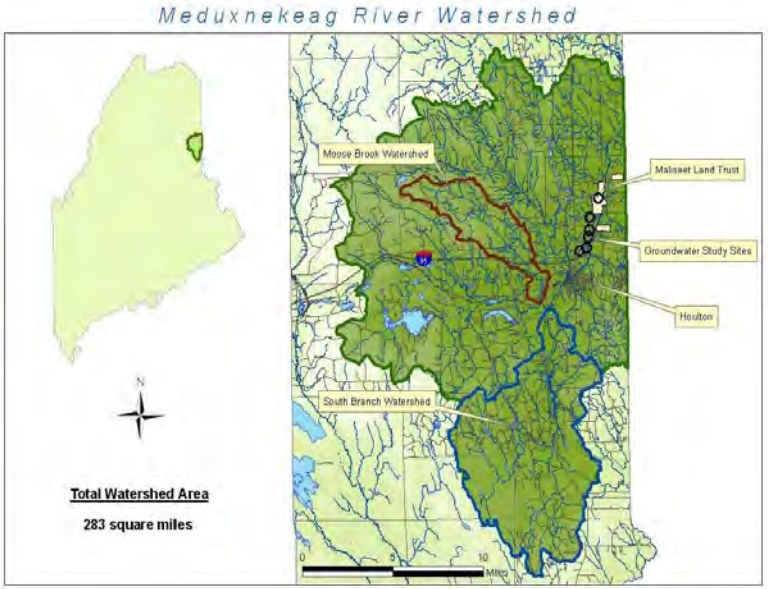
Elizabeth Fretwell,

2006 Master Thesis

University of Maine

Meduxnekeag River Watershed Study

May 8, 2010



Kevin Dougherty (Department of Forestry, Parks and Recreation), Erika Gorczyca (Department of Forestry), Karen Hutchins (Department of Communication and Journalism), Daniel Kary (Department of Economics), Darren Ranco (Department of Anthropology), Andy Reeve (Department of Earth Sciences), Teresa Thornton (Department of Forestry)
University of Maine at Orono

Dr. Darren Ranco

UMaine, Dept. of Anthropology

Sustainability Solutions Initiative

Project Proposal

Maine Agricultural and Forest Experiment Station

I. Project Title:
Using temperature and flow profiling to evaluate groundwater interaction with surface water in Maine.

II. Principal Investigator: | **FTEs on this project:**
Andrew Reeve | 0.10

III. Co-Investigator(s): | **FTEs on this project:**

Cara O'Donnell, Water Resources Specialist, Houlton Band of Maliseet Indians
Frank Kearney, Sr., Superintendent, Old Town Water District

IV. Collaborating Investigator(s):

None

V. Project Duration: **October 1, 2011** **to** **September 30, 2016**

VI. Assurances: *Attach copy of the signed institutional assurance form or letter.*

a. Human Subjects	___	Yes	XX	No
b. Radioactive Materials	___	Yes	XX	No
c. Recombinant DNA or Infectious Agents Research	___	Yes	XX	No
d. Animal Research	___	Yes	XX	No

II. Integrated Research and Extension Activity: ___ Yes XX No

"Integrated activities" means jointly planned, funded, and interconnected activities involving both research and extension to meet new challenges and exploit new opportunities.

VIII. Does the proposed project address the research needs of underserved individuals, groups, or communities in Maine? XX Yes ___ No

IX. Signatures:

Principal Investigator: _____ Date: _____

Unit Administrator: _____ Date: _____

This project has been developed in consultation with the Station Research Council, which used peer reviews to evaluate the scientific validity of the proposal and to determine whether it addresses critical needs for Maine. The project is approved for funding from:

Hatch Funds ☐ McIntire-Stennis Funds ☐ Animal Health Funds ☐

Assigned Project Number: ME

Approval: _____ Date: _____

Dean/Director

Dr. Andrew Reeve,

Associate Professor

UM, Dept of Earth Sciences

Maine Outdoor Heritage Fund
Summary Information Form

Grant application deadlines are March 1 and September 1 of each year. A partnering organization must submit its application to the sponsoring Natural Resource Agency 1 month prior to these deadlines. Natural Resource Agencies should mail nine (9) complete copies of each application to: Carol Gay, Secretariat, Maine Outdoor Heritage Fund, 37 Wiscasset Road, Pittston, Maine 04345. Please provide the following information electronically as well as a signed copy as part of your grant application.

Application Date: 2-23-2010 Funding Category (1, 2, 3 or 4): 1 Resubmittal? No

Is this a follow-up to a previously funded project? No
(If yes, include grant # and title)

Project Title: Enhancement of In-Stream Habitat in Tributaries of the Meduxnekeag River

Project Location (town and county, or statewide): Littleton/Houlton, Aroostook County

Name, Address, Telephone Number and Email of Project Coordinator (please list just one):
Angela Wotton, Southern Aroostook Soil and Water Conservation District, 304 North St, Houlton, ME 04730 (207) 532-2087, ext 3, angela.wotton@me.nacdnet.net

Name, Address, Telephone Number, and Email of sponsoring Natural Resource Agency: Southern Aroostook Soil and Water Conservation District, 304 North St, Houlton, ME 04730, (207) 532-2087, ext 3, angela.wotton@me.nacdnet.net

Names, Addresses, Telephone Numbers, and Emails of Partner Organizations (if applicable) (A partner helps to plan or implement the project):
Dr. Jonathan Niles, Post-Doctoral Researcher, Wildlife and Fisheries Resources, West Virginia University, Morgantown, WV 26506, (304) 288-8879, jniles@mix.wvu.edu and Sharri Venno, Environmental Planner, Houlton Band of Maliseet Indians, 88 Bell Rd, Littleton, ME 04730 (207) 532-4273 ext 215, envplanner@maliseets.com

Abstract of Project
Historical and current land use practices have eliminated or reduced brook trout populations across the Appalachian region. The state of Maine has the highest percentage of intact populations of brook trout in the eastern United States. The stream population of brook trout across the state is estimated, because many streams have not been surveyed and the population status is largely unknown. Management of watersheds to maintain and even enhance habitat and water quality for this important species is critical to sustainable fisheries management in this region. This project is the first phase of a proposed multiple phase, multiple year watershed restoration and enhancement project for the Meduxnekeag watershed. Phase I is a baseline study pilot project designed to identify presence of brook trout populations, and assess aquatic habitat in five (5) tributaries of the watershed. Later phases seek to protect and enhance brook trout populations in these tributaries based on the findings of Phase I.

Statement of Project Objectives:
The objectives of this pilot study will be to: (i) evaluate physical habitat of these tributaries to determine possible placement locations of instream habitat enhancement (ii) evaluate temperature regime of these tributary streams to determine possible placement locations of instream habitat enhancement (iii) evaluate brook trout densities in tributary streams to establish baseline presence and abundance data (iv) implement educational field days on stream sampling and stream restoration for area middle and high school students.

Start Date: May, 2010 Completion Date: December, 2011

Total Project Cost: $72,680

MOHF Funding Request (Include agency administrative costs): $36,300

Cash Revenue Sources: In-Kind Revenue Sources: $36,380

Signature of Commissioner or Director of Applying Natural Resource Agency Date

Sponsoring Agency: Please check one:

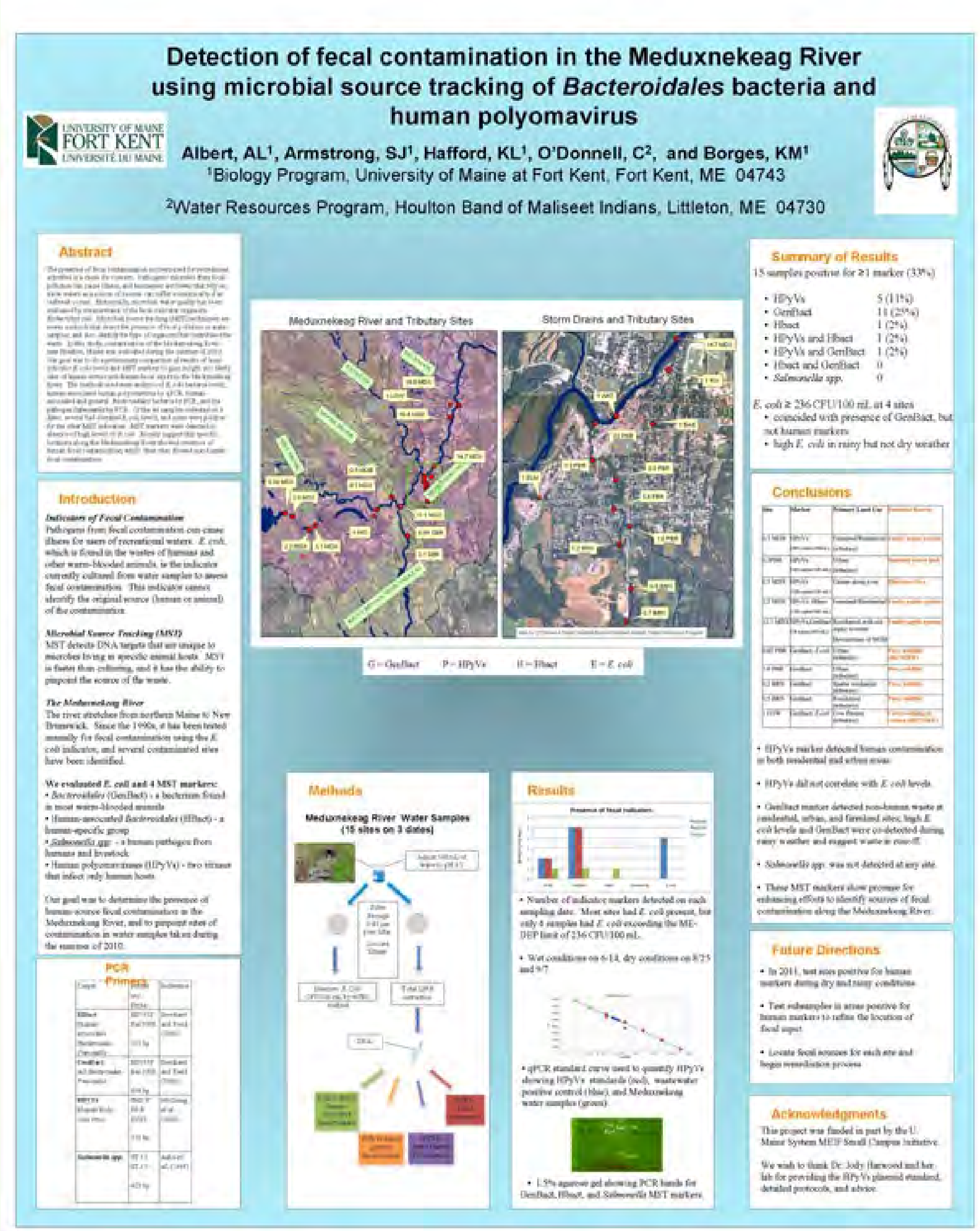
☐ "pass thru" sponsor X "endorsing" sponsor (involved with project)

12/17/07

Dr.Jonathan Niles,

Post-Doctoral Researcher

UWV, Wildlife & Fisheries



Dr. Kimberly M. Borges-Therien
Associate Professor of Environmental Studies
University of Maine at Fort Kent

Aquatic Habitat Study

1) bank height, stability and composition
2) grade controls (e.g. culverts & waterfalls)
3) channel reach morphology (pool-riffle, step-pool, etc)

ROAD - STREAM CROSSING SURVEY

Date _____ (mm/dd/yy) Time _____ Sequence # _____ Site ID

Observer (s) _____ Organization _____

Stream _____ Tributary to _____ Town _____

Road _____ Type ☐ Paved ☐ Unpaved ☐ Railroad ☐ Trail ☐ Driveway

GPS Coordinates [WGS84 UTM Zone 19N Meters] East _____ North _____

DeLorme Atlas Map # _____ Grid Reference _____ Location Description _____

Photo IDs Inlet _____ Outlet _____ Other _____

US from Inlet _____ DS from Outlet _____ High Flow ☐ Yes ☐ No

RR Approach _____ RL Approach _____ No Flow ☐ Yes ☐ No

Basic Structure Type ☐ Bridge ☐ Culvert ☐ Multiple Culverts # _____ ☐ Ford ☐ Removed Structure

Material ☐ Metal ☐ Concrete ☐ Plastic ☐ Wood ☐ Stone ☐ Other _____

Specific Structure Type (see reverse): ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ Ford

Channel Width _____ ft/m ☐ Bankfull Width (*Preferred*) ☐ Wetted Width ☐ Measured ☐ Estimated

Inlet Condition ☐ At Stream Grade ☐ Inlet Drop ☐ Perched

☐ Flow Constriction (Code One) ☐ Deformed ☐ Beaver Fencing

☐ Blocked 25% 50% 75% 100% Inlet Water Depth _____ ft/m

Upstream Substrate ☐ Bedrock ☐ Boulder ☐ Cobble ☐ Gravel ☐ Sand ☐ Clay ☐ Organic ☐ Unknown

A) Inlet Span _____ ft/m B) Inlet Clearance _____ ft/m C) Inlet Wetted Width _____ ft/m

Outlet Condition ☐ At Stream Grade ☐ Perched ☐ Cascade

Outlet Water Depth _____ ft/m Outlet Drop _____ ft/m

Tailwater Scour Pool ☐ Large ☐ Small ☐ None

Tailwater Pool Depth ☐ < 3 ft / 1 m ☐ > 3 ft / 1 m Tailwater Armoring ☐ Extensive ☐ Not Extensive ☐ None

Downstream Substrate ☐ Bedrock ☐ Boulder ☐ Cobble ☐ Gravel ☐ Sand ☐ Clay ☐ Organic ☐ Unknown

A) Outlet Span _____ ft/m B) Outlet Clearance _____ ft/m C) Outlet Wetted Width _____ ft/m

D) Crossing Structure Length _____ ft/m E) Abutment Height _____ ft/m Sliplined Culvert ☐ Yes ☐ No

Crossing Substrate ☐ None ☐ Comparable ☐ Contrasting ☐ Unknown ► Continuous ☐ Yes ☐ No ☐ Unknown

Internal Structures ☐ None ☐ Baffles / Weirs ☐ Bridge Piers ☐ Other _____ Corrugations ☐ Yes ☐ No

Water Depth Matches Stream ☐ Yes/Comparable ☐ No Water Velocity Matches Stream ☐ Yes/Comparable ☐ No

Slope Compared to Channel Slope ☐ Higher ☐ Lower ☐ Same Alignment ☐ Flow-Aligned ☐ Skewed

Significant Sediment Source Upstream ☐ Road / Ditches ☐ Embankment ☐ Stream Banks ☐ None

Downstream ☐ Road / Ditches ☐ Embankment ☐ Stream Banks ☐ None

Wildlife Barriers ☐ None ☐ High Traffic Volume ☐ Steep Embankments ☐ Retaining Walls ☐ Jersey Barriers ☐ Fencing

Comments:

Units ☐ Feet ☐ Meters

Maine Road-Stream Crossing Survey Field Form 6/14/2007


MAP OF THE PROVINCE OF
NEW BRUNSWICK
IN THE PREHISTORIC (INDIAN) PERIOD
• VILLAGES, CAMP SITES, ⇥ PORTAGES
NAMES IN ITALICS ARE EXTINCT
MICMACS
MALISEETS
PENOBSCOTS
PASSAMAQUODDIES

The MNCC (Maliseet Nation Conservation Council), formed in 2004, represents the Maliseet First Nation communities located along the Saint John River watershed in New Brunswick, Canada. The Maliseet traditional territory extends into Quebec, the State of Maine, USA, and on to the Bay of Fundy. Dedicated to conservation and increasing the involvement of Maliseet First Nations people in the co-management of resources located in our traditional territory, the MNCC has its head office in Fredericton, located at 150 Cliffe Street at the Kchikhusis Commercial Centre on the Saint Mary`s First Nation. The MNCC is now entering its collaborative management phase and plans to offer several programs in 2008.

VISION STATEMENT

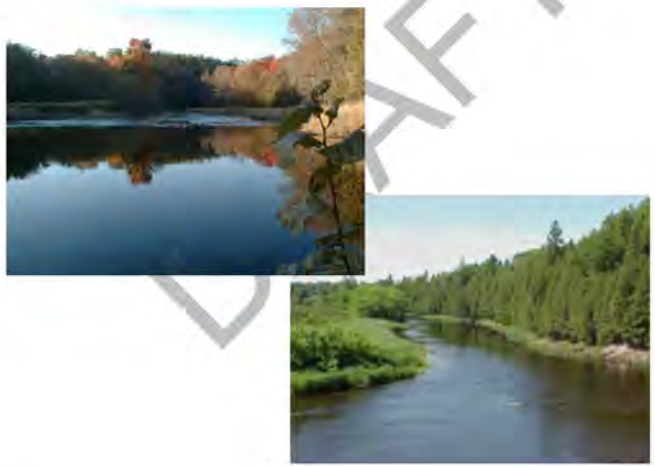
Our vision is that MNCC will be a strong, responsible, well organized, resourceful, accountable and sustainable organization comprised of strong Wolustoq communities that support and practice Wolustgiyik values and help make our vision a reality.

WHO IS MNCC?

•MNCC IS made up of six MALISEET FIRST NATION communities in NEW BRUNSWICK.
•MNCC is a non-profit corporation conservation council promoting conservation and management of our natural resources.
•MNCC entered a co-management agreement with DFO in August 1, 2007.
•MNCC co-manages the ST. JOHN RIVER watershed with DFO.

Section 203 Studies
905(b) WRDA Analysis

Tribal Partnership Program
Houlton Band of Maliseet Indians
Littleton/Houlton Maine



US ARMY CORPS
OF ENGINEERS
New England District

March 2011

Restoration and Protection of the Meduxnekeag and the larger Saint John River.

Study Focus:

1) a trans-border Saint John River watershed plan;
2) feasibility study of diadromous fish restoration alternatives in the Medux;
3) establishing a SJR Board within the IJC.

Initial Feasibility Screening Results:

- fish hatchery and/or rearing facility
- Partner with the Atlantic Salmon for Northern Maine hatchery
- streamside incubation
- instream egg planting/incubation
- SJR Board or committee
- a trans-border watershed management plan

Future Plans

- Implementing Pearce Brook's Watershed-Based Plan
- Aquatic Habitat Restoration in the Meduxnekeag
- Culvert Replacement along Pearce Brook
- Encouraging additional Riparian Buffer Planting