

Salmon Pool Restoration at the Confluence of the Main and South Branches of Bouctouche River



Written by:
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Darlene Elward, Project Manager
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Association des pêcheurs récréatifs du sud-est (APRSE)/
Southeastern Anglers Association (SAA)

Cocagne, New Brunswick
Report 2017

DETAILS OF 2017 RFCPP 16-HGLF-00425

Preamble

Description of Process

Overview

Early Stages of Pool Operation & Photos

Construction

Consultant Design

Permitting

As Built Structures

Observations and Conclusions

Restauration de l'habitat du poisson

Grâce à ses plusieurs partenaires, l'Association
des pêcheurs récréatifs du sud-est
a restauré des sections de
ce cours d'eau en
vue d'améliorer
l'habitat du
poisson.



Fish Habitat Restoration

Thanks to its several partners, the
Southeastern Anglers Association was
able to restore fish habitat on some sections
of the watercourse.



SOUTHEASTERN
ANGLERS ASSOCIATION
ASSOCIATION DES PÊCHEURS
RÉCRÉATIFS DU SUD-EST



TJIPOGTOTJIG MICMAC BAND
BOUCTOUCHE MICMAC BAND



Fisheries and Oceans
Canada

Pêches et Océans
Canada

**Sign Template Presented to RFCPP
for Project 16-HGLF-00425**

OVERVIEW

- a) The Southeastern Anglers Association Inc. (SAA) has restored an Atlantic salmon (*Salmo salar*) pool located at the confluence of the Main and South Branches of Bouctouche River that has been filling up with sediments over the past few years. Environmental consultants at PARISH Aquatic Services (MATRIX) were hired to conduct a geomorphic assessment and topographic survey in the area surrounding the pool, which enabled them to develop a restoration design. Ron Jenkins (Senior Project Manager at MATRIX) has proposed the following methodology to be carried out by the MATRIX team and has provided a rough estimate of the work to be done in the form of a conceptual design/map.
- b) Along with a desktop assessment, a site survey that collects profile and cross-sectional data was conducted, as well as a geomorphic assessment to understand the channel characteristics of the Bouctouche River at this location. Using the data collected from the topographic survey and geomorphic assessment, natural channel characteristics for this reach can be compared to current channel conditions.

HISTORY AND CURRENT INFORMATION

- a) In its early years, SAA saw to it that the pool located at the forks was rebuilt to improve fish habitat. This location was ideal to accommodate a trap net that was used 24/7 to collect and tag salmon. In the fall of each year, Bouctouche First Nations (BFN) and Southeastern Anglers Association recorded the data and released the fish to carry on upstream in both Branches. This project carried on until 1998 when the river was closed to Atlantic salmon fishing.
- b) For a few years, BFN have set up their trap net in the watershed downstream of Coates Mills Bridge. The data collected from their catch is useful information on fish population that travels up river. The success of the restoration efforts can be measured by the changes in the data they might collect in the future. Therefore, we hope to continue a good partnership with BFN and encourage them to continue their trap net practices to better understand the fish population and rivers health. This year, BFN were able to catch 9 Atlantic salmon, both large females and males, tagging 8 but losing one (escaped) before being tagged.

PICTURES TAKEN IN THE EARLY 1990'S OF THE FORKS

These pictures show the setup of the trap net at the location in the early days and the result of a large salmon being released to carry on.



GOOGLE VIEW IN 2015

**FORKS LOCATION AT THE JUNCTION OF MAIN & SOUTH
BRANCHES – BEFORE PICTURES**



Facing South Branch – at the Pool



Facing Main Branch – at the Pool



Upstream from Pool on Main Branch



Upstream from Pool on Main Branch



Downstream from Pool on Main Branch



Downstream from Pool on Main Branch



Downstream from Pool on Main Branch - Sedimentation

DURING CONSTRUCTION LATE SEPT 2017



Construction of Rock Spur (Deflector)



Construction of Rock Spur (Deflector)



Construction of Rock Spur (Deflector)



Construction of Access Stabilization

AFTER PICTURES OF RESTORATION WORK



Upstream of Pool - Blocked Access to Crossing



Upstream of Pool - Blocked Access to Crossing



Upstream of Pool – Access Blocked



At the Pool – Rock Spur Facing Main Branch



At the Pool – Rock Spur Facing South Branch

FIRST ICE OVER COATES MILL POOL



WATER LEVEL HAS RISEN $\frac{1}{2}$ m ABOVE DEFLECTOR



OBSERVATIONS AND CONCLUSIONS

During this project, rock spur dikes (deflectors) were constructed to deflect the water current around an important fish pool. This should result in excess sediments being flushed out of the pool, improving fish habitat over time. Future population surveys will help evaluate the success of this restoration work. Once the work was completed, a sign was placed at the end of the site's access road.

In late September, while the work was being conducted at the Spur, numerous fish were observed near the pool. In early October, SAA has observed, at the Coates Mill Bridge, many Atlantic salmon awaiting water level to rise to move upstream. Shortly after, they were able to migrate upstream to spawn near the newly restored pool. This current information indicates that salmon can access this restored habitat. This newly restored site should improve over time and will provide great fish habitat.

APPENDICES

Permit
Reports – Design & as Built
Sign & Location
Sign



SOUTHEASTERN ANGLERS ASSOCIATION BOUCTOUCHE SALMON POOL RESTORATION

Report Prepared for:
SOUTHEASTERN ANGLERS ASSOCIATION

Prepared by:
MATRIX SOLUTIONS INC.

October 2017
Fredericton, NB

Suite 300, 346 Queen Street
Fredericton, New Brunswick, Canada E3A 9P3
Phone: 506.472.8440 Fax: 506.472.6250
www.matrix-solutions.com

SOUTHEASTERN ANGLERS ASSOCIATION
BOUCTOUCHE SALMON POOL RESTORATION


Report prepared for Southeastern Anglers Association, October 2017

Author:



Amber Yates B. Sc., PTech
Aquatic Biologist

Reviewed by:



Ron Jenkins, ASCT
Senior Project Manager

DISCLAIMER

We certify that this report is accurate and complete and accords with the information available during the site investigation. Information obtained during the site investigation or provided by third parties is believed to be accurate but is not guaranteed. We have exercised reasonable skill, care and diligence in assessing the information obtained during the preparation of this report.

This report was prepared for the Southeastern Anglers Association. The report may not be relied upon by any other person or entity without our written consent and that of the Southeastern Anglers Association. Any uses of this report by a third party, or any reliance on decisions made based on it, are the responsibility of that party. We are not responsible for damages or injuries incurred by any third party, as a result of decisions made or actions taken based on this report.

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APPENDICES

APPENDIX A	Bouctouche River Watersheds at the Forks
APPENDIX B	Construction Photos
APPENDIX C	Asbuilt CAD Sheets

1 INTRODUCTION

Southeastern Anglers Association retained Matrix Solutions Inc. to design restoration plans for a confluence pool on the Bouctouche River near Coates Mills, NB. The topographic survey for the design was completed in June 2017. Construction of the project was completed September 19, 2017. Restoration activities were completed in compliance with Permit for Watercourse Alteration (WAWA) 4255'17. The restoration of the pool at the confluence of the North and South Branch Bouctouche River was undertaken to address sedimentation issues in the pool. Over the years, the pool has accumulated small substrate and thus decreased in depth and quality of habitat. To improve flow through the pool and encourage sediment transport, rock deflectors and spurs were constructed on the right bank of the North and main branch Bouctouche River. The design process included a geomorphic investigation of the site to ensure channel and rock dimensions selected were appropriate and would result in a stable and effective restoration over the long term.

The two main branches of the Bouctouche River are located in eastern New Brunswick. The confluence pool is located UTM: Zone 20 353877E 5135529N. Both systems generally flow east to the Northumberland Strait. The North Branch and South Branch drain areas of 194.25 km² and 97.46 km² respectively, upstream of the confluence pool (Appendix A).

1.1 Purpose

The restoration plan was designed to improve valuable aquatic habitat located at the Forks Pool. The structures were designed and installed to create geomorphic conditions that enhance the quality of the pool habitat and allow the system to maintain the important pool habitat long term. The purpose of this report is to provide documentation of the restoration work.

2 METHODS

Matrix personnel were required to comply with legislated, and Matrix health and safety standards. Project construction commenced in September of 2017, and was monitored by Matrix personnel. Installation of the rock structures was completed using heavy equipment operated by experienced operators. In the same month, Matrix Solutions completed a post construction survey. Photographs during the post-construction survey are included in Appendix B. Refer to Appendix C for drawings derived from the post-construction survey.

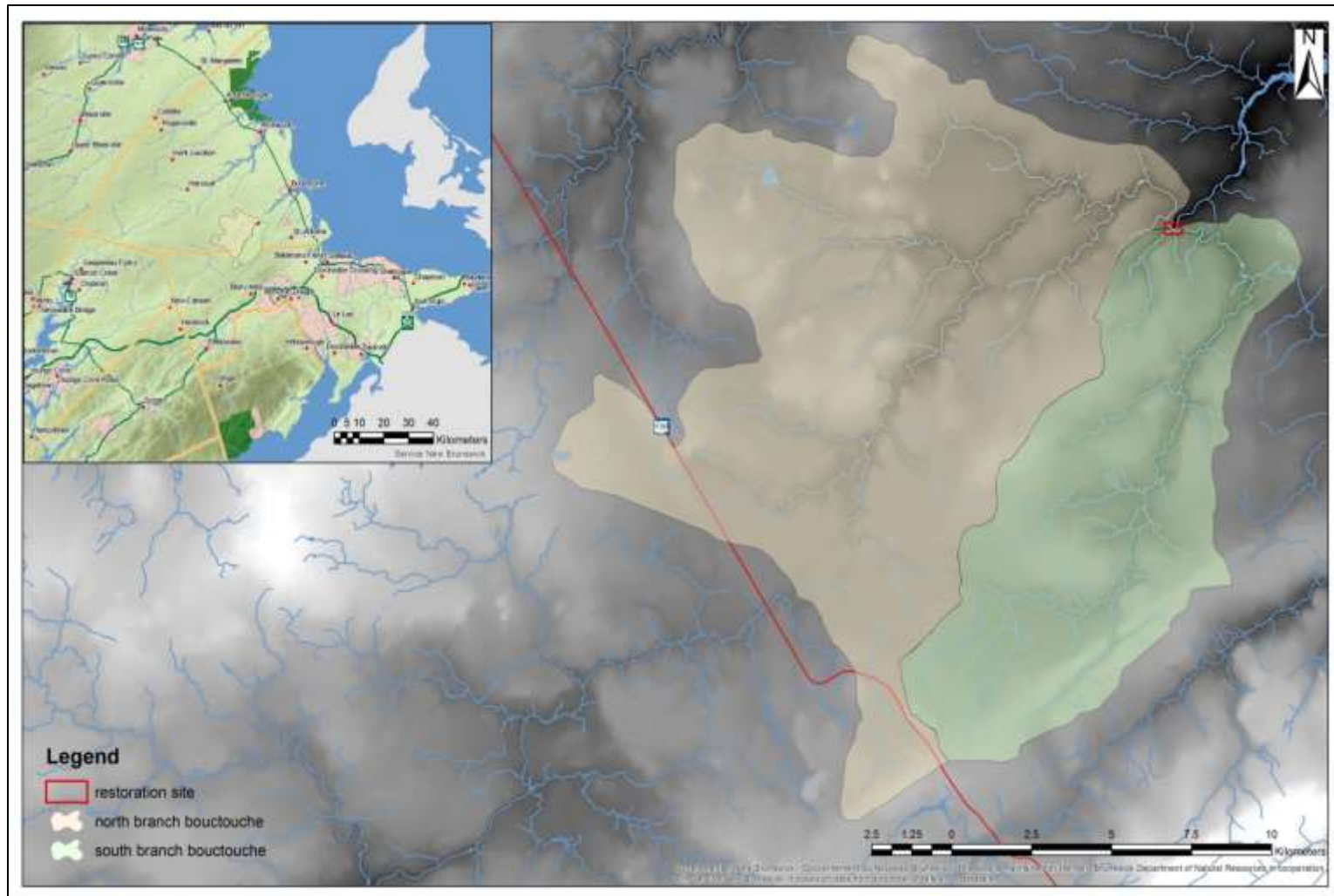
3 CONCLUSION

Restoration of the Bouctouche Forks Pool was completed on September 19, 2017 according to design details. The post construction survey was completed on September 27, 2017. This report provides as-built specifications and photo documentation.

Sediment conveyance through the pool will improve with the installation of the deflectors and spurs. This will enhance the pool habitat and allow the system to maintain the quality pool habitat over the long term.

APPENDIX A

Bouctouche River Watersheds at the Forks



APPENDIX B

Construction Photos

1. Viewing upstream- showing two rock spurs (foreground) and rock deflector on opposite bank (left).



Photograph taken by Nigel Tilson – September 27, 2017

2. Viewing upstream toward north branch river. Showing rock deflector.



Photograph taken by Nigel Tilson – September 27, 2017

3. Viewing upstream toward South Branch river. Rock deflector shown on right.



Photograph taken by Nigel Tilson – September 27, 2017

4. Viewing upstream – showing rock spurs and final bank grade.



Photograph taken by Nigel Tilson – September 27, 2017

5. Viewing south from north bank – at confluence pool. Rock spurs on opposite bank.



Photograph taken by Nigel Tilson – September 27, 2017

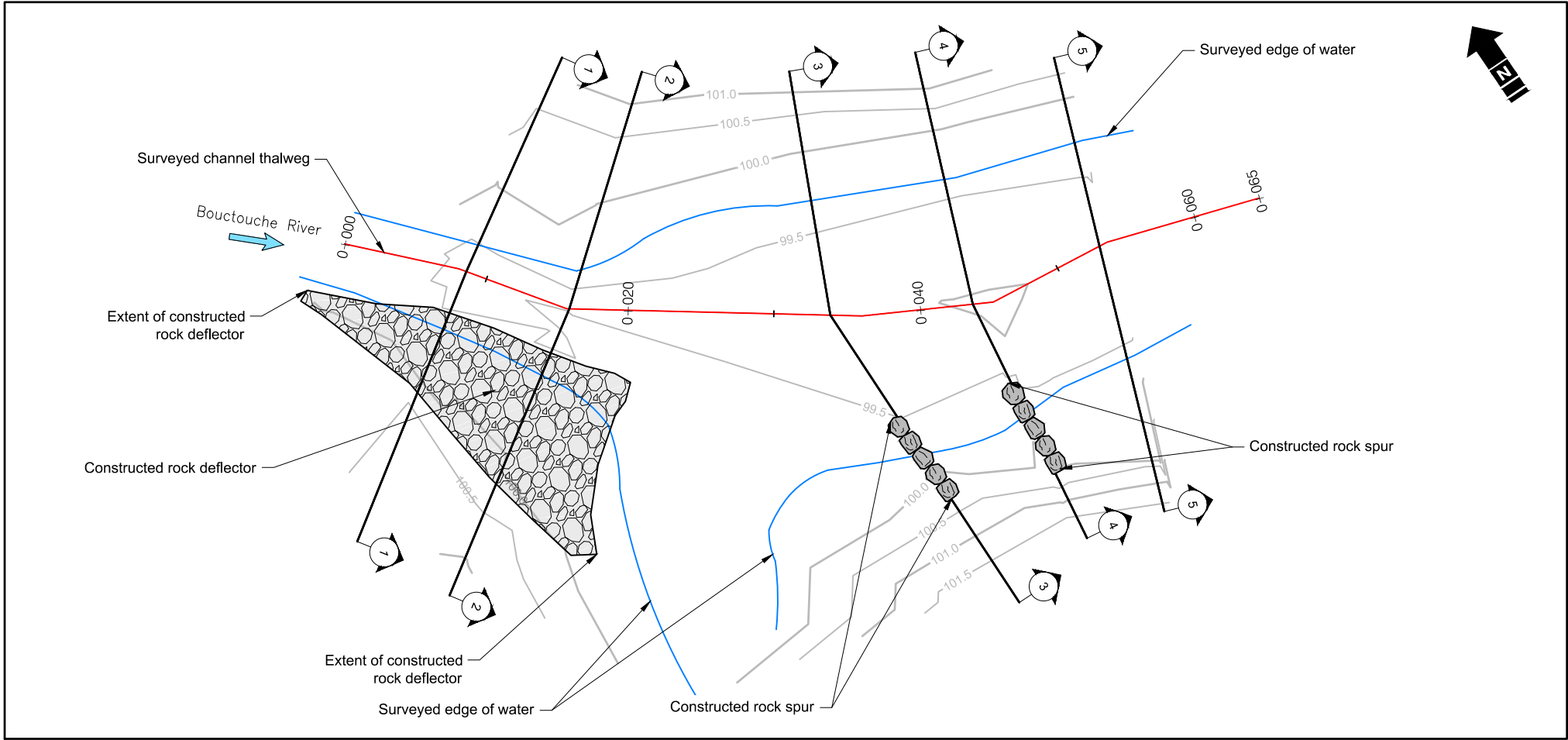
6. Viewing downstream toward Forks pool. Showing rock deflector as built.



Photograph taken by Nigel Tilson – September 27, 2017

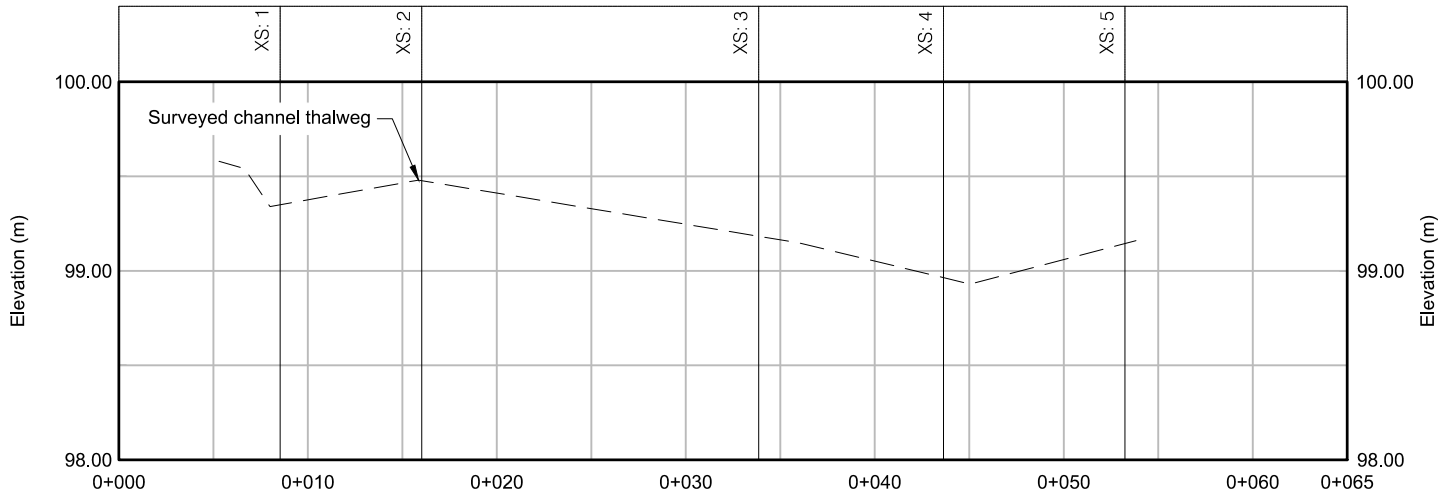
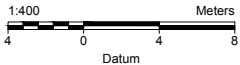
APPENDIX C

Asbuilt CAD Sheets



Legend	
	Existing contour
	Post construction thalweg
	Surveyed edge of water
	Cross section
	Deflector stone
	Rock spur

- Notes:
- Survey completed by Matrix Solutions Inc. on September 27, 2017.
 - All elevations displayed are relative.
 - Contours are shown in 0.5m intervals.



As Built Profile

Horizontal Scale 1:400
Vertical Scale 1:40

REVISION					
00	10 23 2017	Draft for agency review	RJ	JP	ED
No.	DATE	DESCRIPTION	BY	CHK.	DRN.



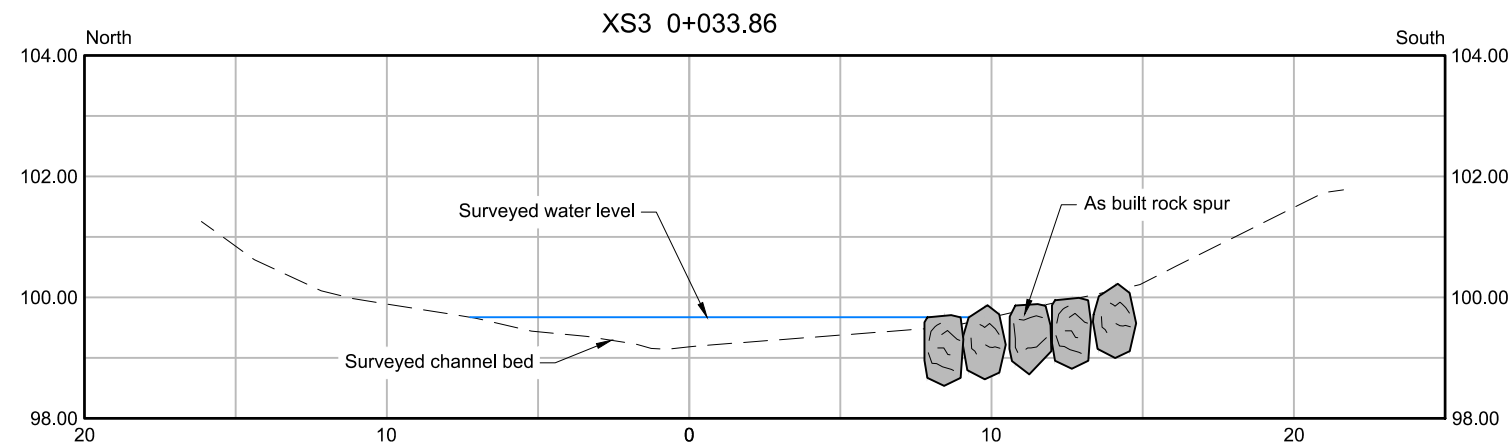
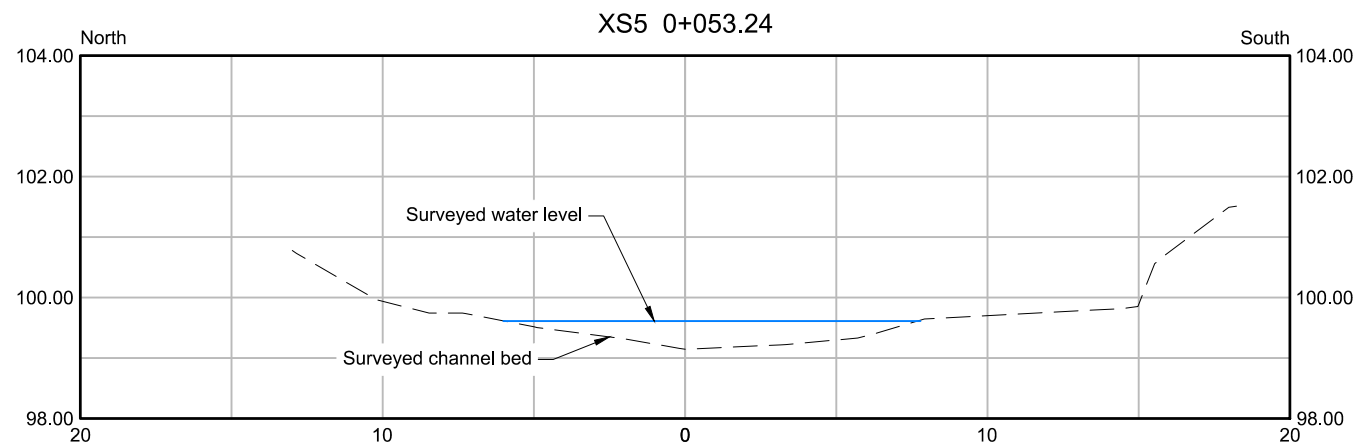
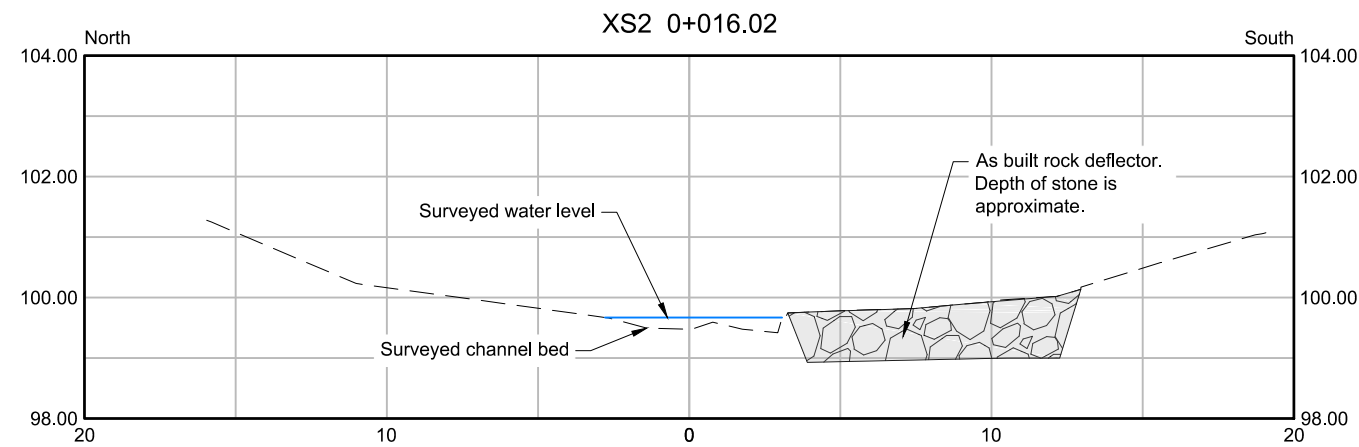
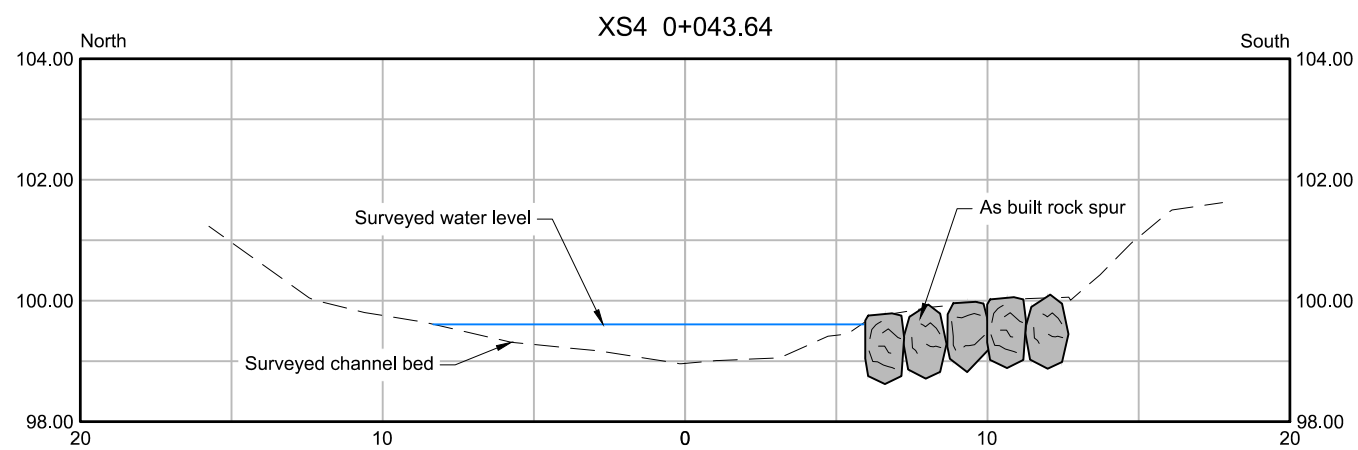
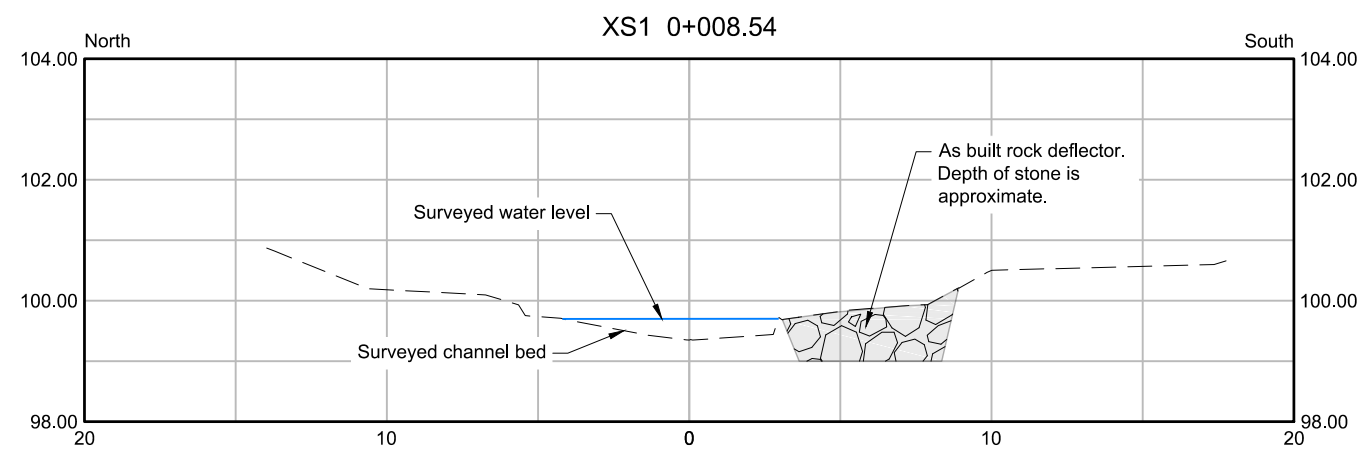
Southeastern Anglers Association
Bouctouche River Forks Pool Restoration

**As Built Survey
Plan and Profile**

Date:	23 10 2017	Project:	23581 Bouctouche	Technical:	R. Jenkins	Reviewer:	J. Parish	Drawn:	E.Drost
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Plot 1:1 = Tabbed (L)



Legend	
	Surveyed channel
	Surveyed edge of water
	As built rock deflector
	As built rock spur

Cross Sections

Horizontal Scale 1:250
Vertical Scale 1:125

Notes:

- Survey completed by Matrix Solutions Inc. on September 27, 2017.
- All elevations displayed are relative.
- Contours are shown in 0.5m intervals.

N:\PROJECT\325381 - Bouctouche River\Matrix\Gis\25381_Bouctouche As Built.dwg - SECT 02 - Monday, October 23, 2017 4:01:17 PM - Eric Drost

REVISION					
00	10 23 2017	Draft for agency review	RJ	JP	ED
No.	DATE	DESCRIPTION	BY	CHK.	DRN.

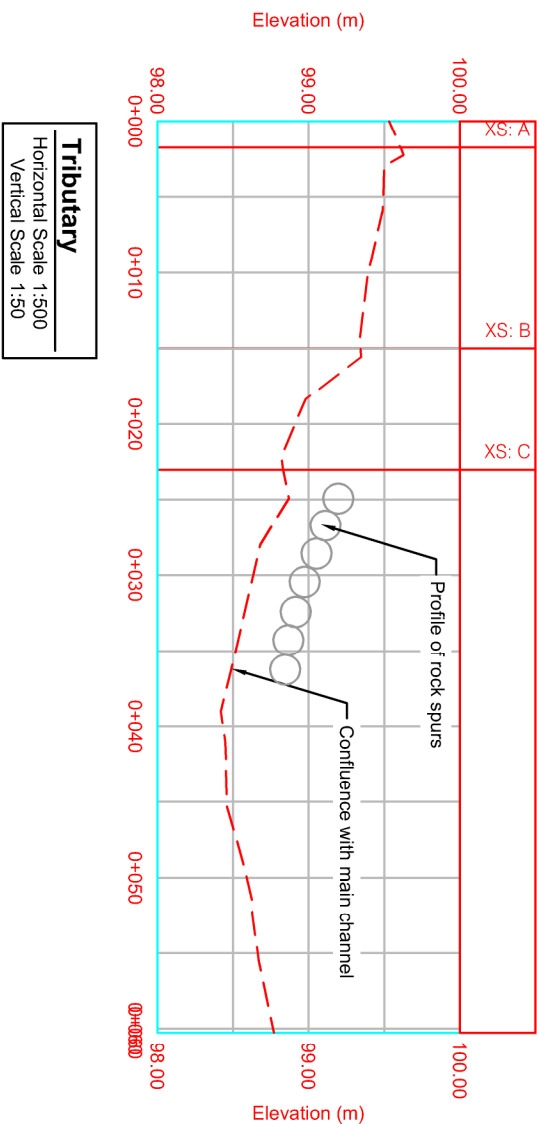
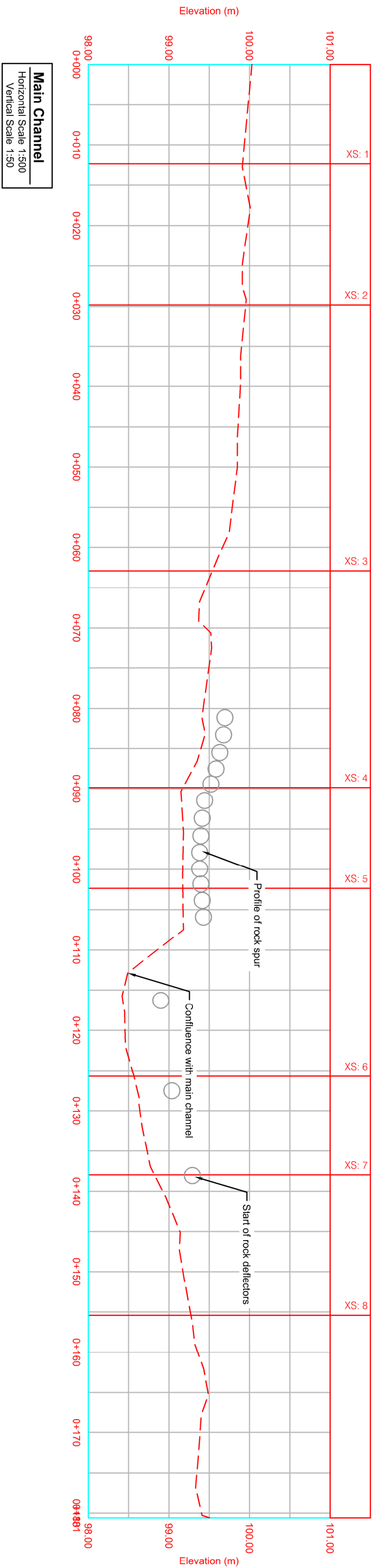


Southeastern Anglers Association
Bouctouche River Forks Pool Restoration

As Built Survey Cross Sections

Date: 23 10 2017 Project: 23581 Bouctouche Technical: R. Jenkins Reviewer: J. Parish Drawn: E.Drost


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Note: Drawing(s) must be used in conjunction with the attached report. Report Name dated Mmmm DD, YYYY and is subject to the limitations and conditions stated in the report.

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<p style="text-align: right;"> Southwestern Anglers Association </p>				
<h1>Bouttouche River Forks Pool</h1> <h2>Profiles</h2>				
Date	16 03 2017	Project	Technical	1. Technical
			Reviewer:	1. Reviewer
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			Drawn:	E. Drost



Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

**Southwestern
Anglers Association**

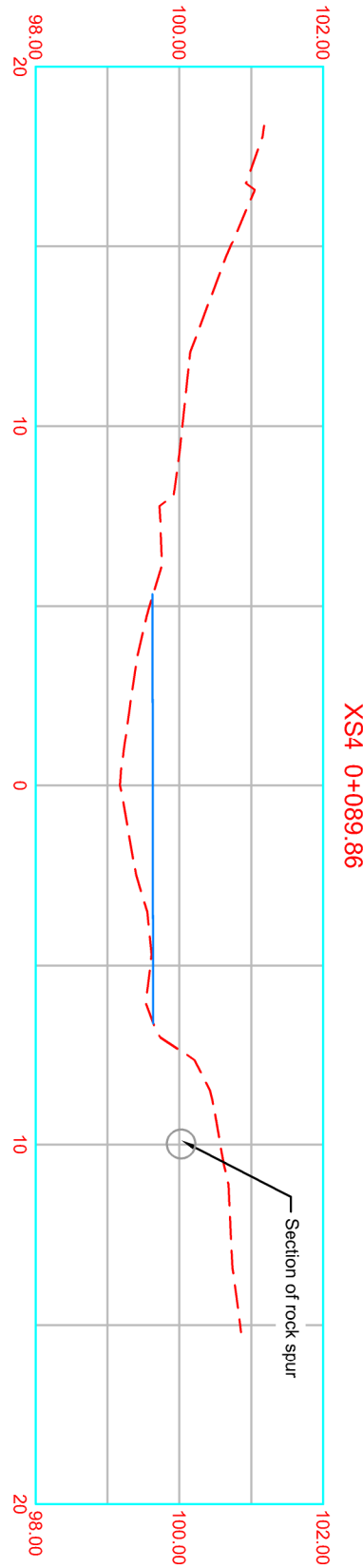
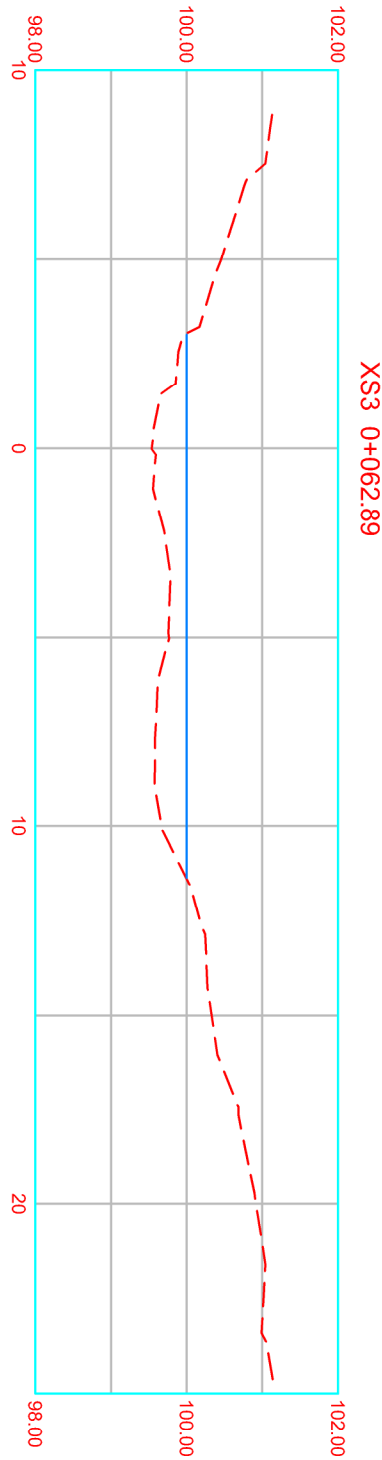
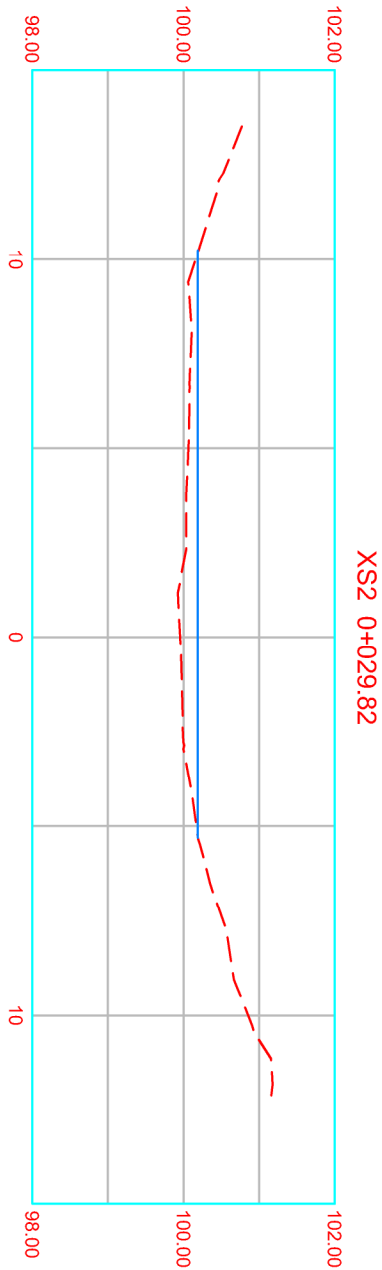
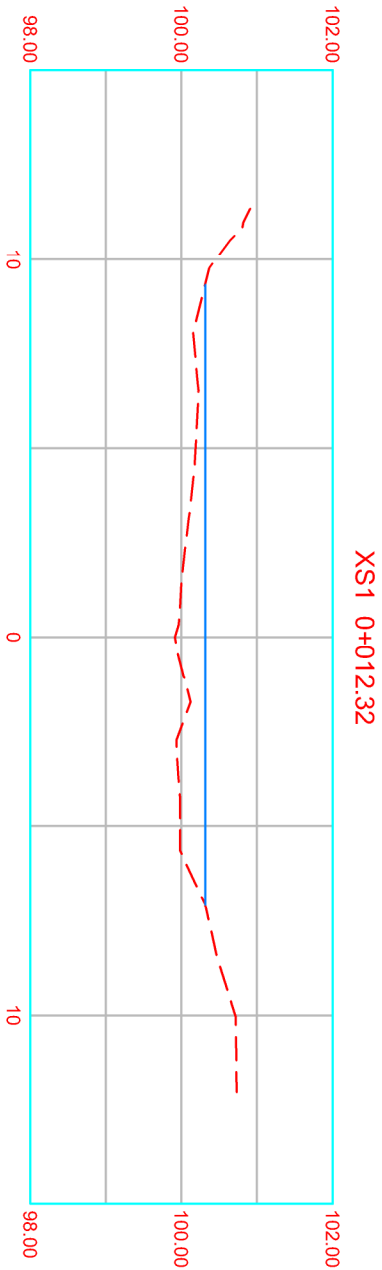
Boucouteche River Forks Pool Profiles

REVISION

No.	DATE	DESCRIPTION	BY	CHK.	DRN.

Date: 16.08.2017 **Project:** **Technical:** I. Technical **Reviewer:** I. Reviewer **Drawn:** E. Drost

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Main Channel
Horizontal Scale 1:200
Vertical Scale 1:100



REVISION

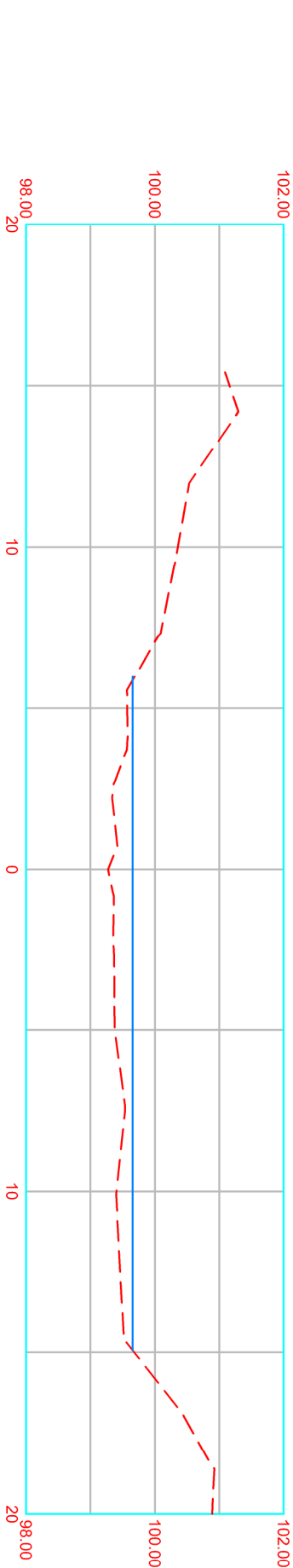
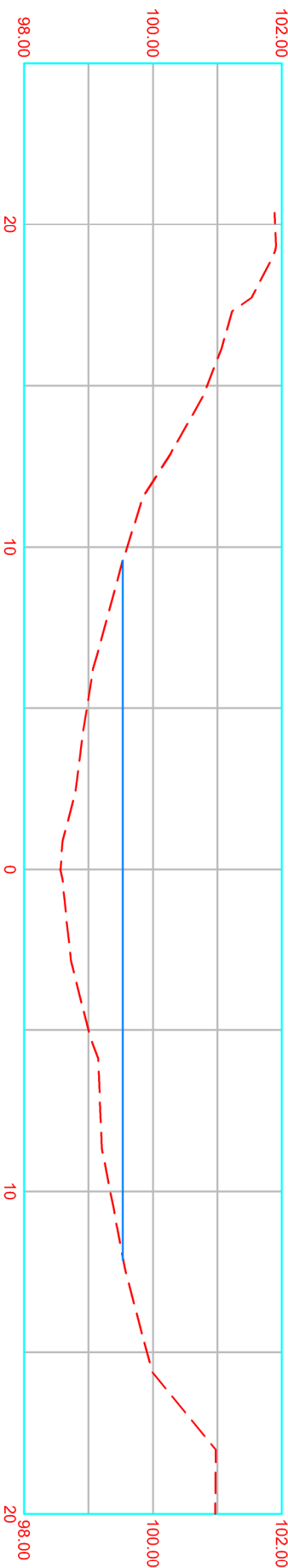
No.	DATE	DESCRIPTION	BY	CHK.	DRN.




Southeastern
Anglers Association

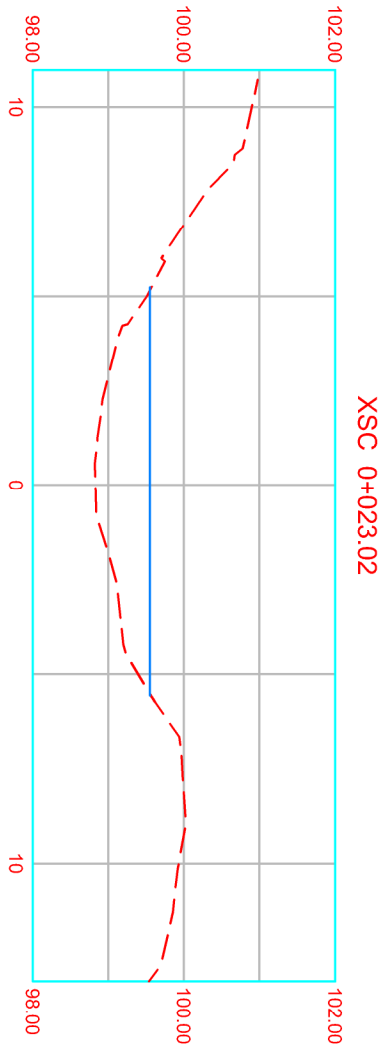
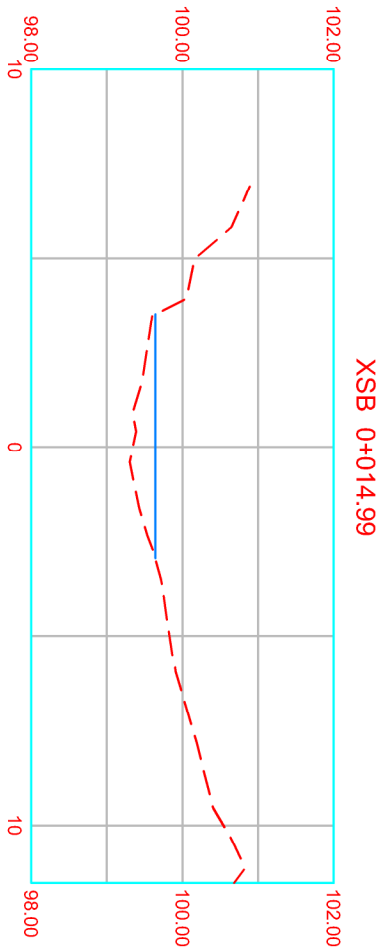
Bouctouche River Forks Pool Channel Sections 1-4

Date	Project	Technician	Reviewer	Drawn
16.08.2017		I. Technical	I. Reviewer	E. Drost
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Southeastern Anglers Association				
Boutouche River Forks Pool Channel Sections 5-9				
DATE	PROJECT	TECHNICAL	REVIEWER	DRAWN
16.08.2017	Project	1. Technical	1. Reviewer	E. Drost
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Tributary
Horizontal Scale 1:200
Vertical Scale 1:100

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[illegible]

			
Southeastern Anglers Association			
<h1>Boutouche River Forks Pool</h1> <h2>Tributary Sections A-C</h2>			
Date:	16.08.2017	Project:	
Disclaimer: The information contained herein may be compared from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, their's Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.	Technical:	Reviewed:	Drawn:
	1. Technical	1. Reviewer	E. Drost



PERMIT FOR WATERCOURSE AND WETLAND ALTERATION
ALT 42551'17 Original

(Regulations 90-80 under the Clean Water Act Chapter C-6.1, Act of New Brunswick 1989)

PERMITTEE	Southeastern Anglers Association Inc. (506)576-2118	ADDRESS	4585, rte route 134 Cocagne, NB E4R 1N6
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LOCATIONS

Easting	Northing	Datum	Zn	Easting	Northing	Datum	Zn
353877	5135529	WGS 84	20				
Affected Watercourse/Tributary: Buctouche River / Buctouche Harbour;							
Affected Regions: ENV - 3		DFO - GULF		DNR - 2			
1:50.000 Maps - 21 I/07		County - Kent		Parish - Saint Mary			

PERMIT VALID FOR THIS PERIOD FROM 2017/08/30 TO 2017/09/30
(yyyy/mm/dd) (yyyy/mm/dd)

Description of Watercourse/Wetland Alteration(s):

This project consists of installing 3 in-stream rock spurs (5 metres length) and a deflector with a footprint of approximately 80 squared metres. The project shall be carried out in accordance with the final version of the design drawings prepared by Matrix Solutions Inc. titled "Bouctouche River Forks Pool".

The Permittee may undertake only those Watercourse/Wetland Alteration(s) described above hereby approved by the Minister. Refer to Conditions of Approval stated on the attached Document "A". Responsibility for any action arising from any watercourse/wetland alteration must be borne by the Permittee and no liability shall be incurred by the Minister or the Department. This permit does not exempt or exclude the Permittee from the provisions of any Act of the Legislature of New Brunswick or of Canada to serve as legal defense to any action commenced by landowners who are adversely affected by the alteration.

Number of conditions attached to this permit: 33

Date of Issuance: 2017/08/30
(yyyy/mm/dd)


Minister of Environment

Southeastern Anglers Association Inc.
4585, rte route 134
Cocagne, NB E4R 1N6

**DOCUMENT "A" Attached to ALT 42551'17 Original
CONDITIONS OF APPROVAL**

(Regulations 90-80 under the Clean Water Act Chapter C-6.1, Act of New Brunswick 1989)

- (1) Other than the alteration(s) described on this permit, no additional alteration shall be carried out in or within 30 metres of the shoulder of the bank of a watercourse/edge of a wetland.
- (2) The permittee shall contact the Surface Water Protection Section, NB Department of Environment and Local Government (506-457-4850) at least 2 working days prior to the commencement of the project.
- (3) The work shall be supervised by an on-site representative of one of the regulatory agencies. Please contact the Miramichi Office of the NB Department of Environment and Local Government (506-778-6032) to make arrangements.
- (4) When self-propelled equipment is being used, an appropriate emergency spill kit shall be kept on-site and be readily deployable. Any spill, regardless of quantity, must be reported by contacting the Department of Environment and Local Government during business hours or the Canadian Coast Guard Environmental Emergency number (1-800-565-1633) after hours.
- (5) Any debris and excavated material generated by the project shall be disposed of such that it cannot be washed into a watercourse/wetland by floodwaters or surface runoff.
- (6) The equipment used shall be in good working order and must not be leaking any fuel, lubricants, or hydraulic fluid.
- (7) A copy of this permit, including the "Conditions of Approval", shall be kept at the alteration site throughout the duration of the project, and such copy shall be produced upon the request of an inspector designated to act on behalf of the Minister of Environment and Local Government, or an employee of Fisheries and Oceans Canada.
- (8) The permittee shall ensure that all persons involved in the project are aware of and comply with the scope, conditions, and environmental constraints of this permit.
- (9) All materials and self-propelled equipment used shall be operated, and stored/parked in an area that prevents any deleterious substance (e.g. petroleum products, silt, etc.) from entering a watercourse/wetland.
- (10) All fill material brought into the 30 metre wide regulated buffer shall be free of contaminants.
- (11) The permittee/agent carrying out the work shall take whatever steps are necessary to prevent noticeable suspended sediment from reaching a watercourse/wetland as a result of the alterations covered by this permit.
- (12) All mitigation measures necessary to prevent suspended sediment from being washed downriver shall be implemented at the onset of the project and maintained throughout.
- (13) If a silt plume results from the work, all work shall cease immediately and the issue must be corrected before continuing the project. If suspended sediments cannot be controlled, the project area shall be isolated from the remainder of the stream flow before work may proceed.
- (14) A portable skimming boom shall be positioned immediately downstream of the self-propelled equipment throughout during the project in the event of any leakage.
- (15) Any part of equipment reaching into the water shall be free of fluid leaks and must be externally cleaned/degreased to prevent any deleterious substance from contaminating the stream flow.
- (16) Equipment shall enter the water at a stable shoreline location as close as possible to the upstream limit of the pool.
- (17) Entry of equipment into the river shall be done with caution, in order to allow fish time to move out of the way.
- (18) Use a common trail to cross the river with equipment while minimizing movements that cause disturbance to the bottom of the watercourse.
- (19) The project shall be carried out during low flow conditions.
- (20) All work shall be done when the water temperature is below 20 degrees Celsius.
- (21) The project shall be carried out during low flow conditions and only during a time when Fisheries and Oceans Canada has not closed salmon angling due to warm water temperatures.

P.m.

**DOCUMENT "A" Attached to ALT 42551'17 Original
CONDITIONS OF APPROVAL**

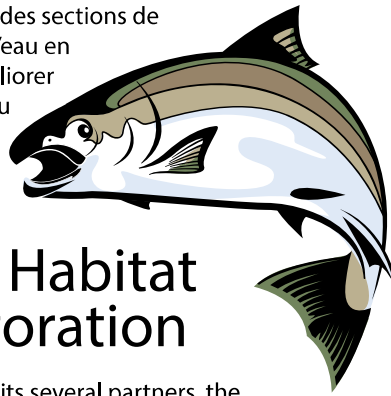
(Regulations 90-80 under the Clean Water Act Chapter C-6.1, Act of New Brunswick 1989)

- (22) The bank of the watercourse shall not be undercut and the shoreline must be left intact except at the entry and spoil removal point. Established vegetation shall not be disturbed during restoration work.
- (23) The entry and spoil removal point shall be stabilized against erosion immediately following completion of the work.
- (24) Rock used to construct the boulder clusters and rock deflectors shall be clean (i.e. free of fine soil particles that could cause turbidity in the stream flow).
- (25) All in-channel work shall be carried out with a backhoe/excavator.
- (26) Excavation shall start at the upstream limit of the pool and progress downstream.
- (27) Excavation shall cease immediately in the event that unconsolidated material is exposed and the excavated area shall be backfilled with pool spoil to help prevent leaching of undesirable material into the stream flow.
- (28) All excavated material shall be removed from the watercourse and disposed of where it cannot return to the stream flow.
- (29) A pool survey shall be carried out immediately following the restoration works. An electronic version of the survey shall be submitted to Catherine Lambert (Catherine.Lambert@gnb.ca), within 30 days of the completion of the work.
- (30) The location of each constructed structure shall be recorded with a GPS device immediately following their construction, and an electronic map showing the exact location of each constructed structure shall be submitted to Catherine Lambert (Catherine.Lambert@gnb.ca), within 30 days of the completion of the work.
- (31) Any vegetation destroyed as a result of project activities shall be replaced with non-invasive perennial vegetation native to the area. The species and density of woody vegetation planted shall be similar to that which existed in the area before the project took place.
- (32) Throughout the project, all exposed erodible soil shall be temporarily stabilized with mulch, erosion control blankets or other products designed to prevent erosion and the runoff of suspended sediment into a watercourse/wetland, prior to each forecasted rain event.
- (33) Upon final grades being achieved, all exposed soil resulting from the project shall be permanently stabilized with non-invasive perennial vegetation native to the area and blanketed with mulch or blanketed with an engineered erosion control product designed to prevent the generation of suspended sediment due to rain or overland runoff events.

P. M.

Restauration de l'habitat du poisson

Grâce à ses plusieurs partenaires, l'Association
des pêcheurs récréatifs du sud-est
a restauré des sections de
ce cours d'eau en
vue d'améliorer
l'habitat du
poisson.



Fish Habitat Restoration

Thanks to its several partners, the
Southeastern Anglers Association was
able to restore fish habitat on some sections
of the watercourse.



SOUTHEASTERN
ANGLERS ASSOCIATION
ASSOCIATION DES PÊCHEURS
RÉCRÉATIFS DU SUD-EST



TJIPOGTOTJG MICMAC BAND
BOUCTOUCHE MICMAC BAND



Fisheries and Oceans
Canada

Pêches et Océans
Canada

LOCATED AT THE JUNCTION OF COATES MILLS NORTH & SHERWOOD RD KENT COUNTY NB

RFCPP 16-HGLF-00425

Legend

- Coates Mills
- 📌 RFCPP -00425

