

The stream crossing inventory was initiated in the spring of 1997. The partners to fill the data gaps in the resource management sector generally and the forestry sector in particular. The program received financial support under the Graduate Employment Program administered by Human Resources Development Canada. Six graduates of post-secondary technical programs were hired on a 6 month term to collect and compile inventory data on stream crossings.

# STREAM CROSSINGS PROJECT 1997-1998

A geographic information system (GIS) for all stream crossings has been collected using a GPS (Global Positioning System) receiver. All GPS receivers used to date on the project have been Trimble survey grade receivers which yield an accuracy of +/- 100 meters. However, when differential processing is done using a computer and the appropriate software, the base data is increased using the internet.

**Partners:**

- Western Newfoundland Model Forest (Lead Agency)
- Center for Forest & Environmental Studies (CFES)
- Dept. Of Forest Resources & Agrifoods (Forest Service)
- Dept. Of Fisheries & Oceans
- Corner Brook Pulp & Paper Ltd.
- Abitibi Consolidated Inc.

**October 1998**

A stream crossing inventory form is filled out for every crossing that is located. For example, stream characteristics such as water velocity, stream substrate, water level, structure type, and fish presence are recorded. This data is collected to better understand the site conditions and is later used to enter the data into the GIS database. In addition, road network summary reports are filed out based on a set road network basis. The purpose of this report is to provide a total count of stream crossings and inaccessible areas per road network.

A collaborative inventory project to characterize the stream crossings on forest resource access roads in Newfoundland. Financial assistance provided in part through the Graduate Employment Program of Human Resources Development Canada.

## **BACKGROUND:**

The stream crossing inventory was initiated in the spring/summer of 1997 by the partners to fill identified data gaps in the resource management sector generally and the forestry-fisheries interaction, specifically. The program received financial support under the Graduate Employment Program administered by Human Resources Development Canada. Six graduates of post-secondary technical programs were hired on a 6 month term to collect and compile inventory data on stream crossings.

## **STREAM CROSSING INVENTORY PROCESS:**

### **[i] GPS DATA COLLECTION (SPATIAL):**

The geographic coordinates for all stream crossings have been collected using a GPS (Global Positioning Systems) receiver. All GPS receivers used to date on the project have been Trimble survey grade receivers which yield an accuracy of +/- 100 meters. However, when differentially corrected using a Trimble base station the accuracy can be improved to 2 - 5 meters. The processing is done using a computer and the appropriate software. The base data is accessed using the Internet.

- Differential correction is a process whereby the positions collected are corrected using data from a base station that has a known surveyed location.
- The base station services have been provided by the Center for Forest & Environmental Studies. However, the actual processing has been left upto the individual crews.

In addition, many of the crews have been using the GPS in conjunction with 1:50,000 topographic maps for navigational purposes. As many of the stream crossings are in very remote and inaccessible parts of the province.

### **[ii] ATTRIBUTE DATA COLLECTION:**

A stream crossing inventory form is filled out for every crossing that is located. For example, attributes such as water velocity, stream substrate, water level, structure type, and fish presence are recorded. This data is collected to better understand the site conditions and is later used to enter the data into the GIS database. In addition, road network summary reports are filled out based on a per road network basis. The purpose of this report is to provide a total count of stream crossings and inaccessible areas per road network.

### **[iii] GIS DATABASE:**

In 1997 the spatial and attribute databases were brought in PC-ARC/INFO and ARC/VIEW to create the stream crossings GIS database. In addition, the database was provided in different formats to meet the needs of the various partners in the project.

### 1997 SEASON:

- 3 stream crossing crews (6 people total)
- Work done in forestry districts: 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
- Inaccessible areas to be picked up in the 1998 season
- 2104 stream crossings inventoried
- Data quality control in place
- GIS Database created based on the 1997 data collected

### 1998 SEASON:

- 3 stream crossing crews & 1 GIS Coordinator (7 people total)
- Expect approx 2000 or more stream crossings to be surveyed.
- Digital photographs of stream crossings being taken by the central crew
- Inaccessible stream crossings collected using ATV's, filling in 1997 gaps
- Quality control check of the 1997 GIS database
- Quality control check of partial 1998 inventory data (as of September 1998)
- Work done in forestry districts: 6, 7, 8, 9, 10, 11, 12, 15, 16, 17

### Crew X (Crown)

- work done in districts 9, 15 (Crown land)
- currently working in district # 12 (Abitiby limits) which should be completed this season.

### Crew Y (CBPP)

- work done in district 6 (CBPP limits)
- currently working on inaccessible in district # 15 (CBPP limits)
- other inaccessible districts they have been working towards: 9, 14, 16

### Crew Z (Abitiby)

- work done in district # 7, 8, 10, 11
- currently working in district # 6 (Abitiby & CBPP) which should be completed this season.
- work to be done in districts 4 or 5 if weather & time permit in the 1998 season.

Currently there has been no work done in the following forestry districts: 1, 2, 3, 4, & 5. These districts spread from the Avalon, Gander, to Musgrave areas and will have to be inventoried in the 1999 season if the project continues.

## 1998 DATABASE :

The database is currently going through a phase of redesign in order to handle the very large amounts of attribute data. It is expected that the database will eventually have 6000 - 8000 stream crossing records, and this figure assumes the entire Island portion of the province. In addition, the new database will be better able to accommodate the digital photographs and comments section. Once again the database will be formatted to the needs of the partners as it was in the 1997 season.

## 1998 DATA ENTRY / GIS:

It is expected that surveying will finish around mid November. Crew members at that time will begin the data entry process.

- Data entry using a Visual Basic data entry frontend to the GIS database.
- Spatial editing of Differential GPS positions processed. This is needed to match the geographic positions with the various projections of the database.
  - UTM (Universal Transverse Mercator)
  - TM (Transverse Mercator)
- Use of Arc/View and Arc/Info GIS

## CONCLUSION:

It is expected that the 1998 season will finish around mid December. At that time, all spatial and attribute data should be entered, compiled and processed. In addition, any spatial editing and quality control will have been completed. Finally, districts that contain gaps and inaccessible areas should be well known at that time.

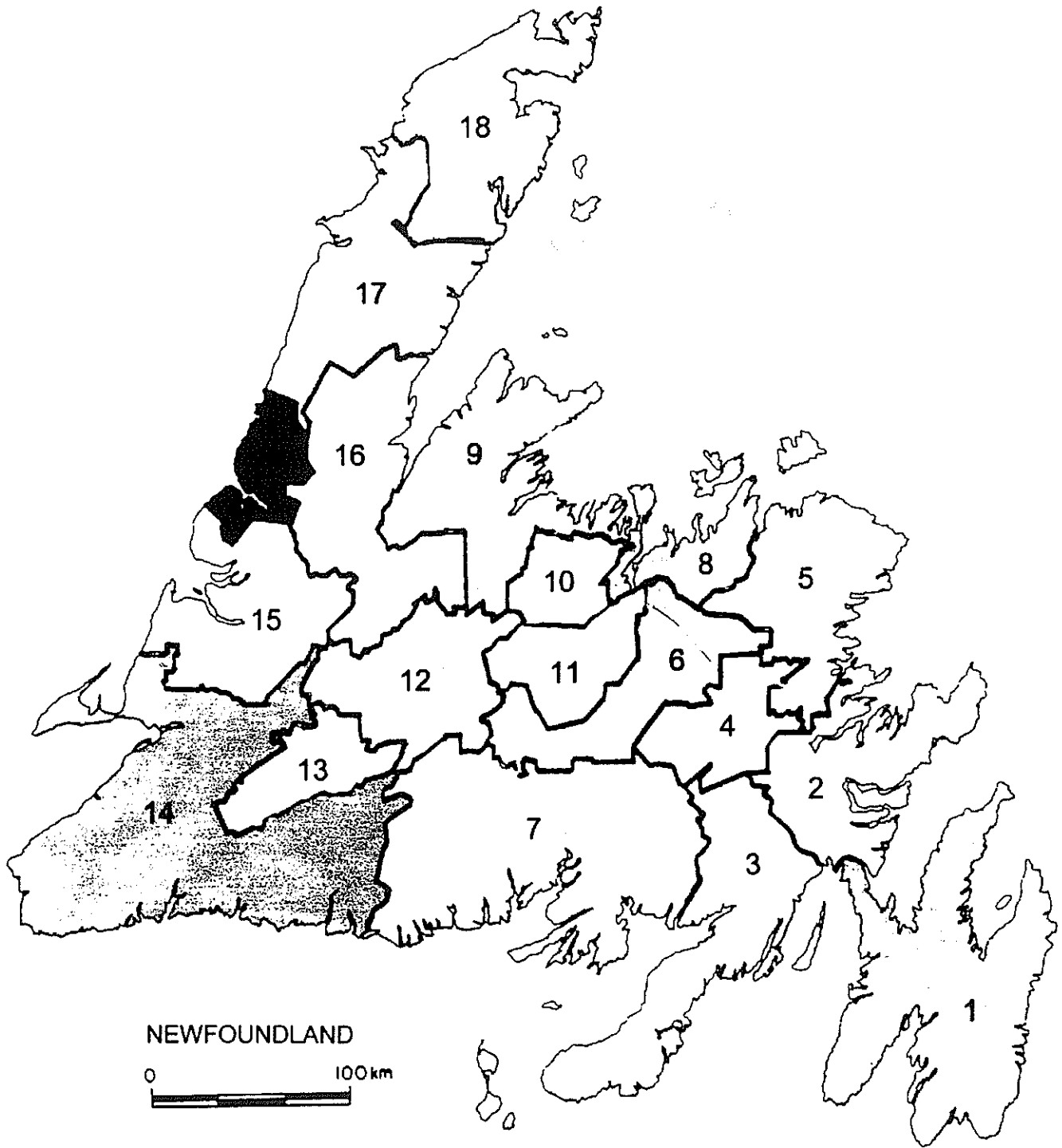
# **STREAM CROSSINGS PROJECT 1997-1998**

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Western Newfoundland Model Forest (Lead Agency)  
Center for Forest & Environmental Studies (CFES)  
Dept. Of Forest Resources & Agrifoods (Forest Service)  
Dept. Of Fisheries & Oceans  
Corner Brook Pulp & Paper Ltd.  
Abitibi Consolidated Inc.

November 20, 1998

A collaborative inventory project to characterize the stream crossings on forest resource access roads in Newfoundland. Financial assistance provided in part through the Graduate Employment Program of Human Resources Development Canada.



NEWFOUNDLAND

0 100 km

Management districts in Newfoundland

## **BACKGROUND:**

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### **Crew X (Crown)**

- work done in districts 9, 12, 15 (Crown land)
- district # 12 has almost been completed.

### **Crew Y (CBPP)**

- work done in districts 6, 9, 14, 15, 16, 17 (CBPP limits)
- focus on inaccessible areas

### **Crew Z (Abitibi)**

- work done in district # 6, 7, 8, 10, 11
- Inaccessible areas done

Currently there has been no work done in the following forestry districts: 1, 2, 3, 4, & 5. These districts spread from the Avalon, Gander, to Musgrave areas and will have to be inventoried in the 1999 season if the project continues.

## **1998 DATABASE :**

The database is currently going through a phase of redesign in order to handle the very large amounts of attribute data. It is expected that the database will eventually have 6000 - 8000 stream crossing records, and this figure assumes the entire Island portion of the province. In addition, the new database will be better able to accommodate the digital photographs and comments section. Once again the database will be formatted to the needs of the partners as it was in the 1997 season.

## **1998 DATA ENTRY / GIS:**

The survey & inventory phase of the project has finished as November 20. The data entry phase of the project will take place from November 25 - December 18.

- Data entry using a Visual Basic data entry frontend to the GIS database.
- Spatial editing of Differential GPS positions processed. This is needed to match the geographic positions with the various projections of the database.
  - UTM (Universal Transverse Mercator)
  - TM (Transverse Mercator)
- Use of Arc/View and Arc/Info GIS

## **CONCLUSION:**

The 1998 season will finish on December 18th. At that time, all spatial and attribute data should be entered, compiled and processed. In addition, any spatial editing and quality control should be completed. Finally, districts that contain gaps and inaccessible areas should be well known at that time.

