

**NEWFOUNDLAND
SOIL SURVEY AND LAND USE
PROGRAM
1981**



Dept. of Rural, Agriculture & Northern Development
Soil and Land Management Division



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LAND REFORM DIVISION
NEWFOUNDLAND
SOIL SURVEY
PROGRAM

NEWFOUNDLAND SOIL SURVEY AND LAND USE PROGRAM 1981

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NEWFOUNDLAND SOIL SURVEY AND LAND USE PROGRAM 1981

TABLE OF CONTENTS

	<u>PAGE</u>
<u>SOIL SURVEY PROGRAM</u>	1
Exploratory Soil Surveys	3
Reconnaissance Soil Survey	7
Detailed Soil Surveys	10
<u>LAND USE PROGRAM</u>	14
Historical Background	14
Farm Land Preservation	15
Farm Land Development Projects	22
<u>FIGURES</u>	
Figure 1 - Exploratory Soil Survey Program	6
Figure 2 - Current Reconnaissance Soil Survey Program	8
Figure 3 - Detailed Soil Surveys, Performance Management Surveys, Miscellaneous Surveys	13
Figure 4 - Location of Agricultural Development Areas	17
Figure 5 - Planning Process for Agricultural Development Areas	21
<u>TABLES</u>	
Table 1 - Exploratory Soil Survey Program	5
Table 2 - Current Reconnaissance Soil Survey Program	9
Table 3 - Detailed Soil Surveys, Performance Management Surveys and Miscellaneous Surveys	12

NEWFOUNDLAND SOIL SURVEY AND LAND USE PROGRAM 1981

TABLE OF CONTENTS (con't)

	<u>PAGE</u>
<u>AGRICULTURAL DEVELOPMENT AREAS 1981</u>	
Map 1 ----- St. John's	25
Map 2 ----- Wooddale	26
Map 3 ----- Humber Valley	27
Map 4 ----- Robinson's - St. Fintan's	28
Map 5 ----- Codroy Valley	29
Map 6 ----- Musgravetown	30
Map 7 ----- Green Bay (Halls Bay-Springdale)	31
Map 8 ----- Green Bay (King's Point)	32
Map 9 ----- Green Bay (Indian Pond)	33
Map 10 ----- Port Au Port	34
Map 11 ----- Winterland	35
Map 12 ----- Burin	36
Map 13 ----- Markland	37
Map 14 ----- Lewisporte (Brown's Arm - Botwood)	38
Map 15 ----- Lewisporte (Comfort Cove)	39
Map 16 ----- Gander Lake	40
Map 17 ----- Terra Nova	41
Map 18 ----- Avalon South	42
Map 19 ----- Bay d'Espoir	43

SOIL SURVEY PROGRAM

The Newfoundland landscape can be best described as a mixture of bogs, barrens, rock outcrops, water bodies and mineral soil. Much of the interior of the island portion of the province is covered by extensive bogs and barren lands. These sparsely forested heath and moss barrens result from wind exposure, humid conditions, temperature limitations and soil conditions. The soils found on these upland barrens are very coarse, usually very stony, have firm to compact subsoils and are often quite shallow.

The boreal forest which surrounds these interior barrens is characterized by dominantly coniferous species and broad leaved deciduous trees. This natural vegetation is often indicative of deeper soils that may be suitable for agricultural use. The more favourable soils and better climatic conditions for agriculture are usually found on elevated ridges, along river terraces and on coastal lowlands.

Newfoundland soils are very acid and the dominant soil limitation to crop growth is low fertility. The soils require regular applications of lime and fertilizers to supplement elements necessary for plant growth. Numerous other soil limitations also hinder the development of land for agricultural use. Limitations such as excessive stoniness create additional management problems and costs for land clearing.

Wet soils require drainage improvements and add to the cost of putting land into production. Soils with compact subsoil layers resist penetration of plant roots and percolation of rainfall, leading to shallow rotting of crops and excessive moisture in the soil. Topography also restricts the use of land for agriculture. Steep slopes and complex topography often prevent use of farm machinery and create erosion hazards. However, soil conditions do vary quite rapidly across the landscape and some areas are better suited to agriculture than others. Knowledge of the distribution of various soil types and land distribution patterns is needed to channel agricultural activities into the most suitable areas. Soil surveys are required in order to provide adequate resource information for good land use and land management planning. They provide farmers with information on soil and land types that will help them manage their operations more efficiently. Decisions that must be made on amendment applications, planting and harvesting times, crop types and machinery requirements are related to soil conditions.

During the course of a soil survey, pedologists make numerous observations and descriptions in preparation for the compilation of the final map and report. Soil types are established according to specific characteristics. Each soil type in its particular

environment has an expected response to crop suitability, soil management or engineering uses. Soil maps and technical grouping of soil types therefore become very important in classifying land and selecting suitable types of land use. Good soil survey interpretations will help the soil map user in evaluating the land for various purposes and serve as a very succinct educational tool.

As such, the soil survey program has been tailored to coincide with the needs and priorities of the agricultural land and farm development program. It is designed to provide three levels of information, each with specific uses and interpretations. The three levels are Exploratory, Reconnaissance and Detailed. Each type of survey identifies in a general way the accuracy of a survey and the overall purpose of the survey. The term Survey Intensity Level is proposed to convey this meaning. Soil surveys at various survey intensity levels will carry implications about the appropriate scale of publication, field procedures and rates of progress. The survey intensity level of a particular project will also be determined by the objectives of that survey.

EXPLORATORY SOIL SURVEYS

An Exploratory Soil Survey has a low survey intensity level and is designed to offer information for broad regional planning.

The Newfoundland Exploratory Soil Survey Program provides the basis for the Canada Land Inventory (C.L.I.) Soil Capability Mapping. It is a very rapid type of survey that provides critical data necessary for planning and setting of long term agriculture priorities. Exploratory surveys give an overview as to the scope of problems involved in future agricultural development and lay the groundwork for ensuing land suitability and productivity studies.

Exploratory type maps are used by the Agriculture Branch Land Use Section to set up broad boundaries for Agriculture Development Areas. These surveys give an estimate of the location, extent and quality of the land throughout the Island, thereby enabling agricultural planners to direct activities into the most viable areas. The survey maps also provide information for other interested groups such as, foresters, engineers, park planners and wildlife officers.

Newfoundland Exploratory Soil Surveys

- Scale of Working Manuscript Maps and Aerial Photographs	1:50,000
- Scale of Published Maps	1:250,000
- Mapping Rate of Progress (per season/per surveyor)	75,000 - 250,000 hectares

The Exploratory Soil Survey Program in Newfoundland is nearly completed. Figure 1 and Table 1 show the present status and on-going schedules for this type of survey.

Table 1

Exploratory Soil Survey Program

(Survey Intensity Level 5)

Number	Mapsheet	Soil Survey	Status	Agr. Capab.	Status
	Botwood (2E,F)	1:250,000	In Preparation	1:250,000	Published
	Stephenville (12B)-Port- aux Basques (110)	1:250,000	In Preparation	1:250,000	In Preparation
	Sandy Lake (12H)	1:250,000	In Preparation	1:250,000	Published
	Gander Lake (2D)	1:250,000	In Preparation	1:250,000	In Preparation
	Belleoram (1M, L)	1:250,000	In Preparation	1:250,000	In Preparation
	Red Indian Lake (12A)	1:250,000	In Preparation	1:250,000	In Preparation

Five survey intensity levels are recognized, level 1 to level 5.

Level 1 represents the more detailed intensive surveys and is referred to as the highest survey intensity level. Level 5 represents much more general surveys and is characterized by a low intensity survey level.

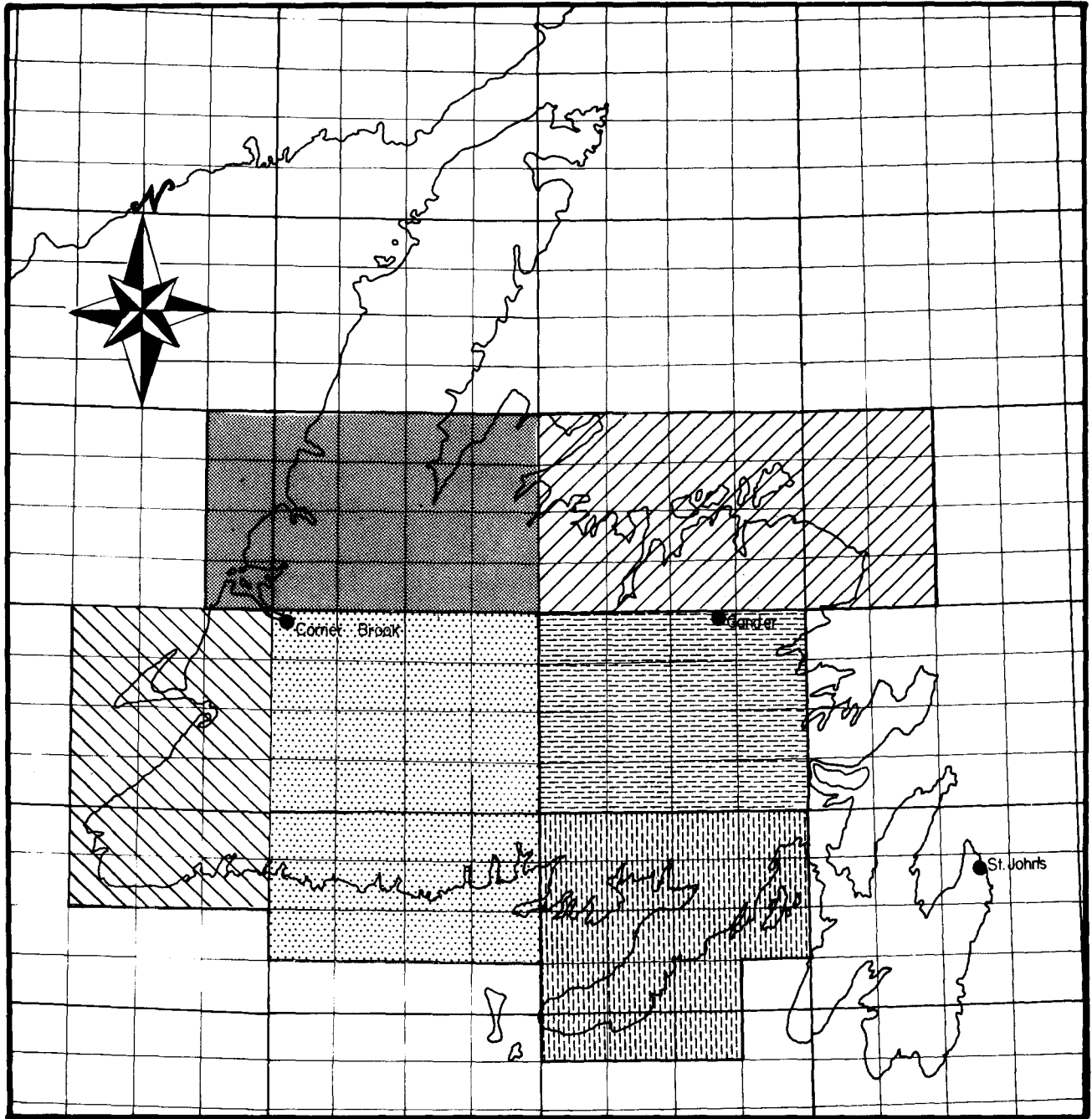


FIG.1 Exploratory Soil Survey Program

-  Botwood (2E), Wesleyville (2F)
-  Stephenville (12 B), Port aux Basques (11 O)
-  Sandy Lake (12 H)
-  Gander Lake (2D)
-  Belleoram (1M), St. Lawrence (1L)
-  Red Indian Lake (12 A), Burgeo (11 P)

Reconnaissance Soil Surveys

Reconnaissance soil surveys are of an intermediate intensity level and provide more information and interpretations than that gathered in exploratory work. A reconnaissance type of survey is designed to provide information for planning agricultural activities within Agricultural Development Areas and identifying areas for farm expansion and establishment of new farms.

Ideally, reconnaissance surveys are preceded by general information collection and correlation at the exploratory level. The Reconnaissance Soil Mapping Program is usually based on land capability information derived from exploratory mapping and priorities of the Land Use sector. Various parts of the Newfoundland Reconnaissance Program have however been completed over the years because of the immediate need for more precise information in some high priority agriculture areas. Present survey plans call for the completion of reconnaissance soil survey for all areas that have potential for agriculture.

Information gathered at this survey level is used to formulate development plans within designated Agricultural Development Areas. The types and locations of agricultural enterprises together with the planning of compatible infrastructure, industry and residential development are also based on this soil survey

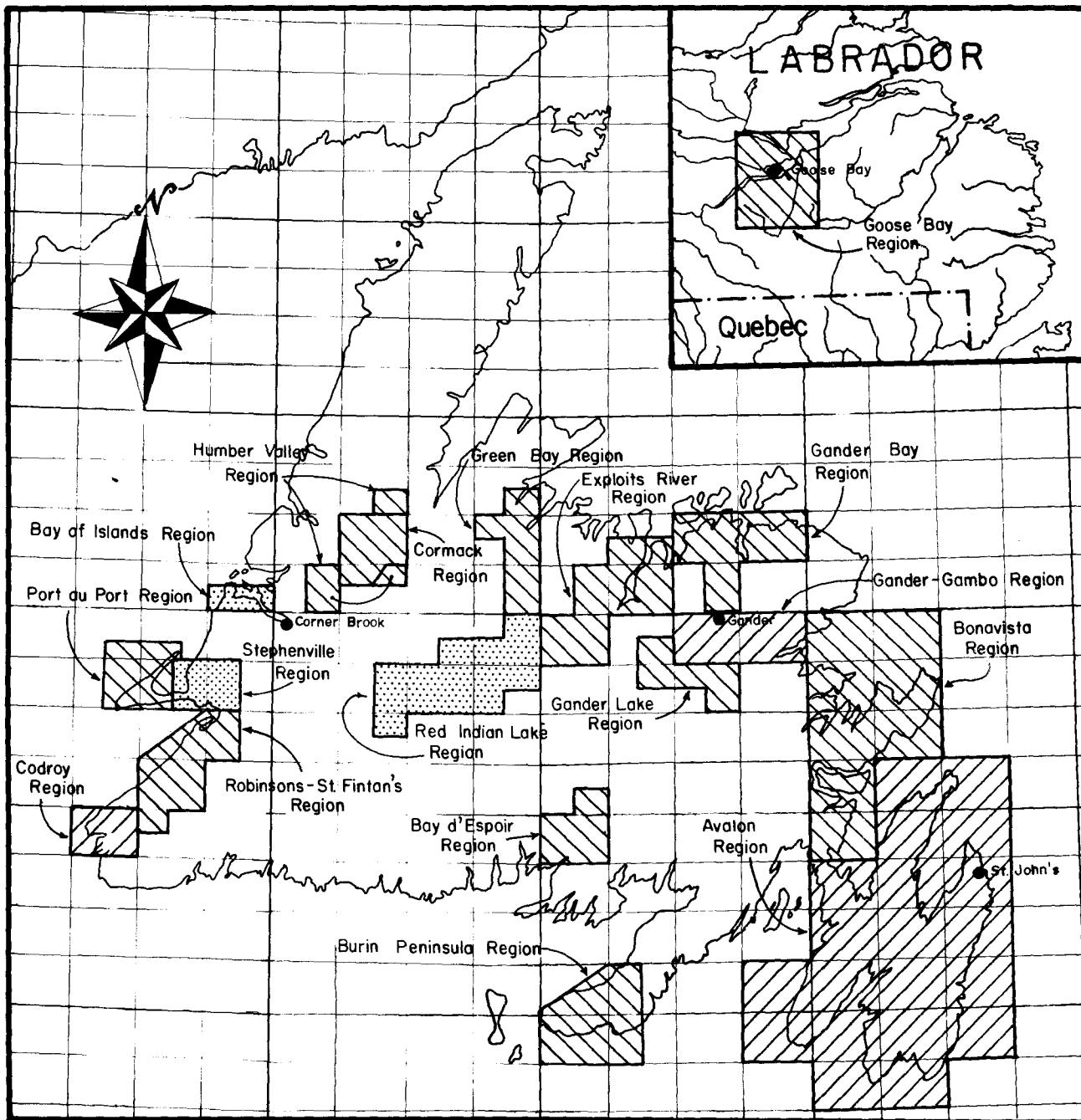


FIG.2 Current Reconnaissance Soil Survey Program

STATUS OF RECONNAISSANCE MAPPING PROGRAM




-  Published Report
-  In Preparation For Publication
-  Proposed Survey Areas

TABLE 2

CURRENT RECONNAISSANCE SOIL SURVEY PROGRAM

MAP SHEET	SOIL SURVEY	LEVEL	AGRI. CAPAB.	STATUS
Gander-Gambo (2D/15,16)	1:63,360	3	1:63,360	Published
Avalon (1N,K)	1:100,000	3	1:100,000 1:250,000	Published
Codroy Valley (110/14)	1:50,000	3	1:50,000	Published
Port au Port (12B/10,11)	1:50,000	3	1:50,000	In Preparation
Cormack (12H/3,6)	1:50,000	3	1:50,000	In Preparation
Bonavista (2C)	1:100,000	3	1:100,000	In Preparation
Robinsons & St. Fintans (12B/2, 7, 8 & 110-15)	1:25,000	3	1:25,000 1:50,000	In Preparation
Humber Valley (12H/3, 4,11)	1:12,500 1:25,000	2 3	1:12,500 1:25,000	In Preparation
Exploits River Region (2E/3, 6 & 7)	1:12,500 1:25,000	2 3	1:12,500 1:25,000	In Preparation
Green Bay Region (12H/1 8 & 9)	1:25,000	3	1:25,000	In Preparation
Bay d'Espoir Area (1H/12)	1:12,500	2	1:12,500	In Preparation
Burin Peninsula (1M/3, 4 & 1L/13, 14)	1:35,096	3	1:35,096	In Preparation
Goose Bay Area (13F/7, 8 & 9)	1:50,000	3	1:50,000	In Preparation

Proposed: Red Indian Lake Region - tentative pending Exploratory Soil Survey Results.

Stephenville Region; Gander Lake Region; Gander Bay Region; Bay of Islands Region.

program. Reconnaissance type surveys give major emphasis to physical attributes of the land and soil such as slopes drainage, texture, and stoniness. They do not provide a great amount of detail on such features as soil productivity, fertilizer response or soil conservation.

Figure 2 and Table 2 show the previous surveys that have been undertaken and the status of the active and proposed surveys.

Newfoundland Reconnaissance Soil Survey

- Scale of Working Manuscript Maps and Aerial Photographs	1:10,000 to 1:50,000
- Scale of Published Maps (usual range)	1:25,000 to 1:100,000
- Mapping Rate of Progress (per season/per surveyor)	6,000 to 60,000 hectares.

Detailed Soil Surveys

The final routine soil survey program planned for the province is Detailed. It is characterized by a higher survey intensity level and deals with specific land management problems. These surveys are more time consuming and are usually done over smaller areas; they supply information for many purposes at the level of groups of farms down to the level of small farms.

An example of this type of survey, is a detailed mapping project that was carried out on approximately 1000 acres of Crown Land within the St. John's Agricultural Development Area. This survey provided basic soil information for planning and management of this area known as "The Goulds Forage Project".

Detailed soil surveys are usually carried out in prime farming areas to provide information for increasing productivity and improving land management. Surveys at the highest survey intensity level give information on slope, drainage, texture and stoniness and also relate these to site specific levels of costs and necessary management techniques.

The detailed surveys along with several performance management and miscellaneous surveys are shown and listed on Figure 3 and Table 3.

Newfoundland Detailed Soil Surveys

- Scale of Working Maps and Aerial Photographs	1:12,500
- Scale of Presentation (most common scale)	1:12,500
- Mapping Rate of Progress (per season/per surveyor)	1,500 to 3,000 hectares

TABLE 3

DETAILED SOIL SURVEYS, PERFORMANCE MANAGEMENT SURVEYS
AND MISCELLANEOUS SURVEYS

LEGEND		
NO	AREA AND SURVEY	SCALE
1	Sandy Brook Area - Soil and Performance Management Survey (1978)	1:15,840
2	Wooddale Development Area (1979)	1:12,500
3	Musgravetown Development Area (1979)	1:12,500
4	Whites River Road - Humber Valley Development (1980)	1:12,500
5	Butts Pond Area (1979)	1:12,500
6	Terra Nova Land Development Area (1979)	1:15,840
7	Agricultural Potential of Big Meadows Pond Area near Lawn (1975)	1:15,840
8	Potential for Agriculture in the Buchans Area (1976) (miscellaneous)	1:50,000
9	Land Capability of the Pynn's Brook Resource Centre (1978)	1:3,863
10	Investigation of the Swansea Sheep Breeding Station for Land Suitable for Pasture Development (1978)	
11	Land Capability of the Provincial Seed Potato Farm, Glenwood (1976)	1:12,500
12	Agricultural Capability of Goulds Forage Development Area (1979)	1:12,500
13	Western Island Pond - Agricultural Potential (1979)	1:25,000
14	Peters River Area - Wooddale (1966)	1:18,000
15	Development Area Markland (1980)	1:12,500
16	Soil Capability - Mint Brook (1979)	1:15,840
17	Soil Capability - Triton Brook (1979)	1:15,840
18	Northern Arm Forest Access Road (1980)	1:12,500
19	Goose Arm Road (1980)	1:12,500
20	Reidville (1980)	1:12,500
21	Fischell's	1:12,500

Note: Most of the above maps and reports will not be published but, can be made available upon request.

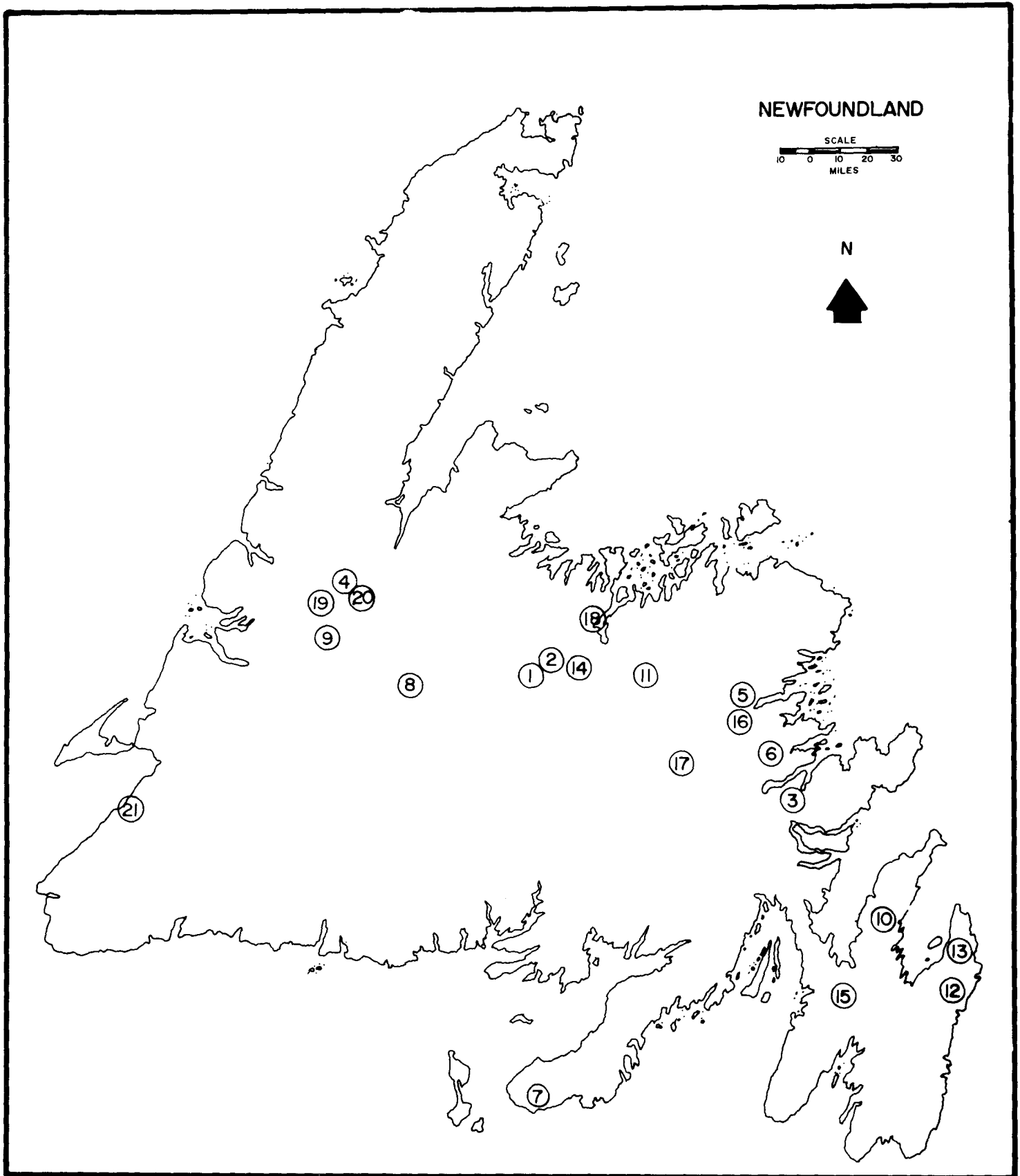


Figure 3 : Detailed Soil Surveys, Performance Management Surveys, Miscellaneous Surveys

LAND USE PROGRAM

HISTORICAL BACKGROUND

Traditionally, agriculture has comprised of part-time farms concentrated on small acreages throughout Newfoundland's coastal regions. Potatoes, cabbage and turnips were grown. Also, small numbers of cattle and sheep were raised for home or local use. Although small in size and number, farms in the province prior to Confederation were relatively successful. However, following Confederation and the loss of protective tariffs in 1949, coupled with improved transportation systems for foodstuffs from the mainland, the economic position of the farming sector gradually declined. Local producers have not been able to consistently supply well graded quality products with the result that wholesalers often purchase in bulk from the mainland. For example, less than one-third of all vegetables currently being consumed in the province are produced locally.

Although the actual number of farms in the province appears to have declined since Confederation, many of the existing and establishing commercial farmers have had to expand their operations to meet the changing conditions. Unfortunately, however, much of this expansion was not well planned. Little consideration was given to factors such as viable farm size, availability of services, and the advantages of clustering farm developments. All

too often, development was left to find its own course with inefficient and frequently conflicting land use patterns evolving. In addition, much of the prime farmland was being taken out of production through residential and commercial encroachment, cabin developments, and other non-farming activities.

The allocation and development of Crown Land was also not always well planned. Many leases and grants were issued for agricultural purposes only to have the land farmed for a short period of time, and then removed from agricultural production. The result has been the alienation of thousands of acres of good farmland. The practice of severing granted land into small non-viable parcels, coupled with the practice of issuing small leases with little or no provisions for expansion, has resulted in a very fragmented land ownership situation.

As a result of these problems, many farmers today are unable to locate enough land on which to expand. The most seriously affected are new entrants in agriculture who require large unified tracts of suitable land on which to establish a viable commercial operation.

Farm Land Preservation

The soil surveys conducted to date indicate that less than 1% of the Island, that is, less than 100,000 hectares are actually suitable

for farming. In order to become self-sufficient in agricultural commodities that can be produced under our soil and climatic conditions, nearly all of the province's suitable land would be needed. The prospects of reduced supplies from imported sources and increasing transportation costs will soon mean that the province will have to become self-sufficient in those products that can be grown locally.

In order to ensure that the remaining suitable land base is available for future food production and to assist in developing it to its potential, the Government adopted the approach of designating Agricultural Development Areas. These areas (shown on Figure 4) have been identified based on criteria such as soil surveys, market potential, current levels of production and growth potential. They possess the best potential for a viable agricultural industry and contain nearly all the land that is suitable for agriculture. Because of this, most of Government's agricultural programs for expansion are being directed to these areas.

In most of the development areas, detailed land use plans are currently being produced. This involves extensive field research including the update and revision of land ownership data, an assessment of current land use patterns, and an assessment of human and economic resources. Fieldwork has been concentrated mainly in the priority areas of Codroy, Robinson's-St. Fintans', Humber Valley

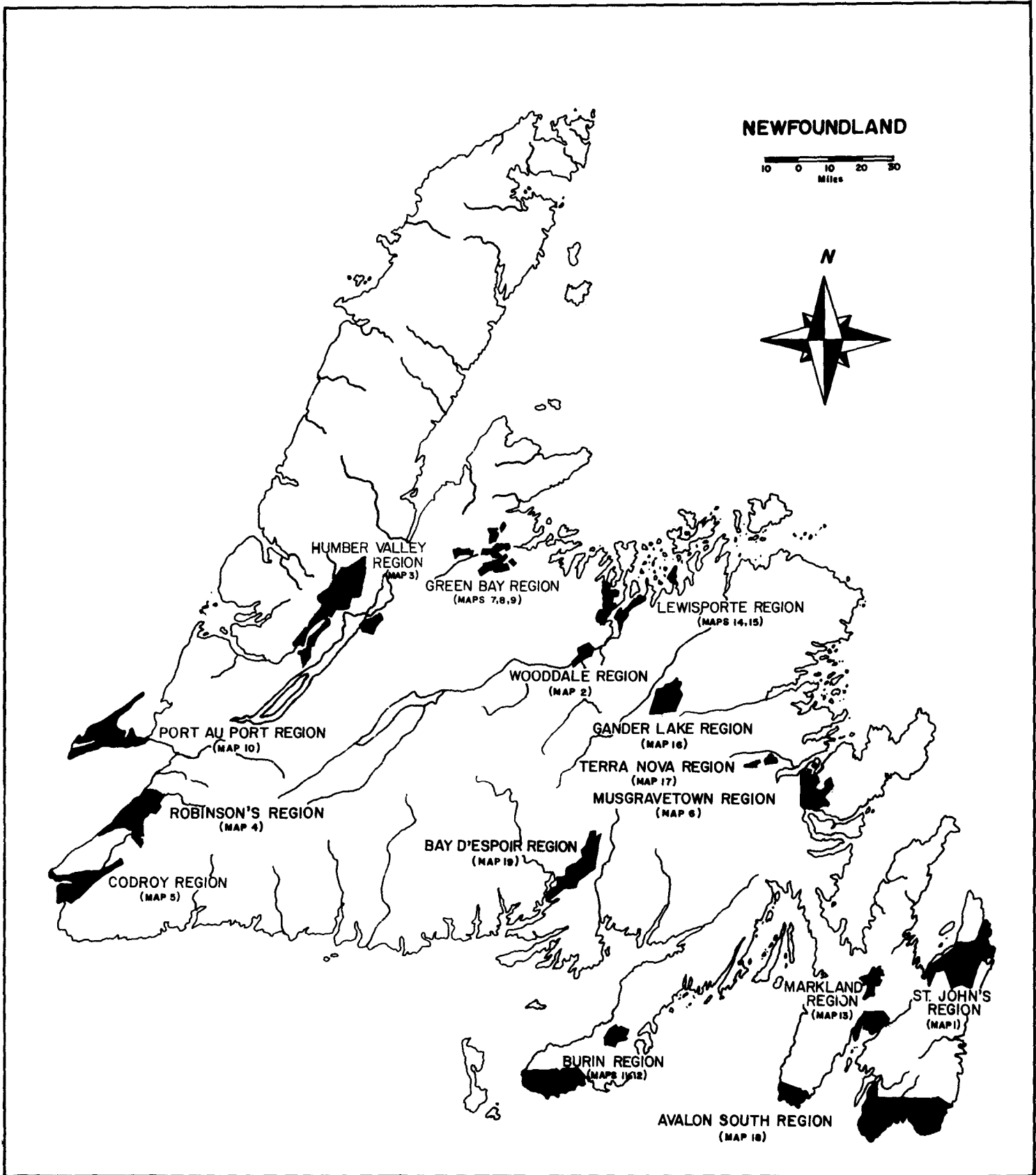


Figure 4 : Location of Agriculture Development Areas

Wooddale, Musgravetown and St. John's regions since the program was initiated in 1978. It is anticipated that much of this work will be completed by 1982, with work in the remaining areas to be completed in ensuing years.

Following the preparation of land use plans, it is proposed that the major agricultural areas be officially designated and regulated under Chapter 95 of The Development Areas (Lands) Act, 1976. Essentially, this means that land use not compatible with agriculture would be restricted or tightly controlled. At the present time, these controls are in place in the St. John's and Wooddale Regions. Land Use studies conducted to date have identified a need for similar controls in the Agricultural Development Areas of Codroy, Robinson's - St. Fintan's, Humber Valley, Springdale, Musgravetown and Winterland. It is now being proposed that these areas be legislated in the near future. In the remaining agricultural areas, conflicting pressures are not so great yet as to warrant regulated controls. A continuing program of monitoring these areas is now in place.

The control mechanism for areas officially zoned pursuant to the Development Areas (Lands) Act is through regulations that have been developed to restrict non-compatible uses. Each set of regulations has been designed individually to meet the needs of the region to

which they apply. The main intent of the regulations is to preserve and protect land from conflicting uses that irreversibly remove it from agricultural production. Also, land sub-division in most instances, and the removal of topsoil and sod is prohibited. Land may be sold under these regulations, but may only be used for agricultural purposes.

As with any type of restricting or controlling activity, many pressures prevail. Land suitable for agriculture is often prime for other commercial or residential development. These multiple use demands on land, particularly in the St. John's Agricultural Development Area, have resulted in a great deal of land speculation. Developers have taken options on land whereby they pay farmers large sums of money just for the right to purchase. The Government's reply to this type of pressure can be summed up in a quote from its recently published Five Year Development Plan 1980-85, Managing All Our Resources.

"Land with agricultural potential is too limited in our Province to allow...it to fall into the hands of speculators operating under the misapprehension that it will eventually be re-zoned for non-agricultural development purposes. It is the firm policy of this Government that "frozen" agricultural areas will remain frozen".

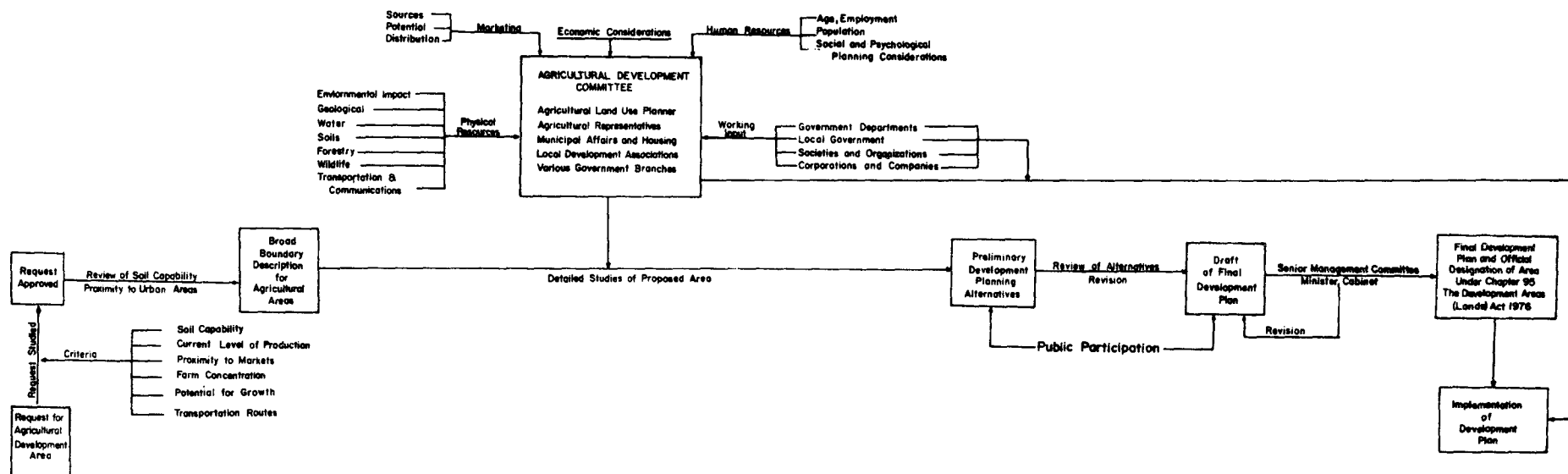
Not all areas are under the same pressure from conflicting uses as the St. John's Zone. Several designated areas, particularly

in the west, are grossly underutilized. Land use and land ownership studies have revealed that most of the idle land is owned by non-farmers who show little interest in putting it into production, nor are they willing to sell or rent their land to active farmers.

Counteracting the idle land situation is of major concern if Newfoundland is to meet its agricultural land needs. To help get this land into production the Government's Five Year Development Plan emphasizes that "measures will be taken to induce owners of unused farmland to release that land to farmers. Government cannot allow this industry to be hampered by idle resources".

The Agricultural Development Areas are shown on the accompanying set of maps. The boundaries of these units and the development of agricultural plans to utilize the limited areas of suitable land have not been prepared by Agriculture's land use planning staff in isolation. Input has been supplied by agricultural representatives and other branches within agriculture, the lands branch, forestry branch and a variety of other provincial and local agencies. The progression of events followed in preparation of development plans is shown in Figure 5. The development plans will act as co-ordinated agricultural planning guidelines.

FIGURE 5. PLANNING PROCESS FOR AGRICULTURAL DEVELOPMENT AREAS



Farm Land Development Projects

Although land preservation has constituted the major thrust in the Land Use Program, several other aspects are also very important. The development project concept for example, has and will continue to play a very significant role in the planning and allocation of the remaining Crown Land suitable for agriculture. Two significant projects that have been initiated for the development of large blocks of Crown Land, for new farming activities are the Goulds Forage and the White's River Road projects. These have been very successful in establishing adequate land bases for a number of the province's existing and new farmers.

The White's River Road project area is located within the Humber Valley Agricultural Development Area. Prior to 1979, numerous leases, too small for sustained commercial agricultural production were issued in the vicinity of this project, and several lease applications within what is now the project area were pending. In order to preserve the remaining suitable land in this area, the White's River Road farm land development project was established. All pending lease applications were cancelled and the Soil and Land Management Division embarked upon a systematic development scheme. Detailed soil surveys were conducted during the summers of 1979 and 1980. This soils information was then used to plan out five units ranging in size from 136 to 240 acres. Also, a road providing

access to several of the units was planned and constructed under the province's farm access road program. These units were then advertised and successful candidates were selected from the numerous proposals received. These individuals are now in the process of clearing and preparing the land for agricultural production. Hydro electric services will be provided when development reaches the stage that such development is required.

The Goulds Forage Project was handled in a similar manner. In this case, however, the intent was to establish sufficient forage production areas for several existing dairy farmers within the St. John's Agricultural Development Area. Here also, soil surveys were conducted, forage units were established under lease and access roads were constructed.

In general, the management and handling of land capable for agriculture has greatly improved in the past few years. Hopefully, programs such as land preservation and farm land development will result in the maximization of agricultural production and ensure an adequate land base for agriculture for years to come.

AGRICULTURAL DEVELOPMENT AREAS

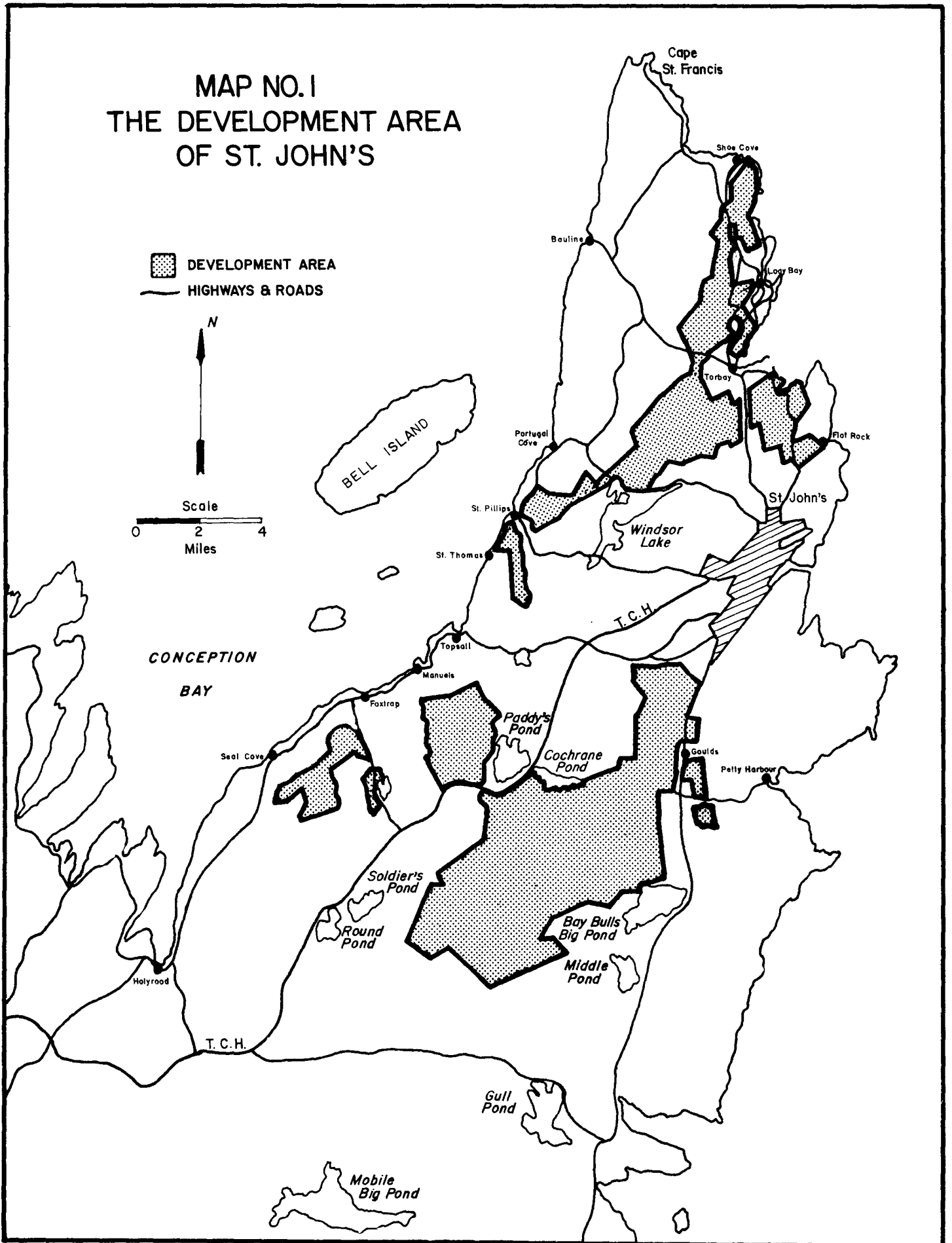
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MAP NO. I THE DEVELOPMENT AREA OF ST. JOHN'S





 DEVELOPMENT AREA
 HIGHWAYS & ROADS



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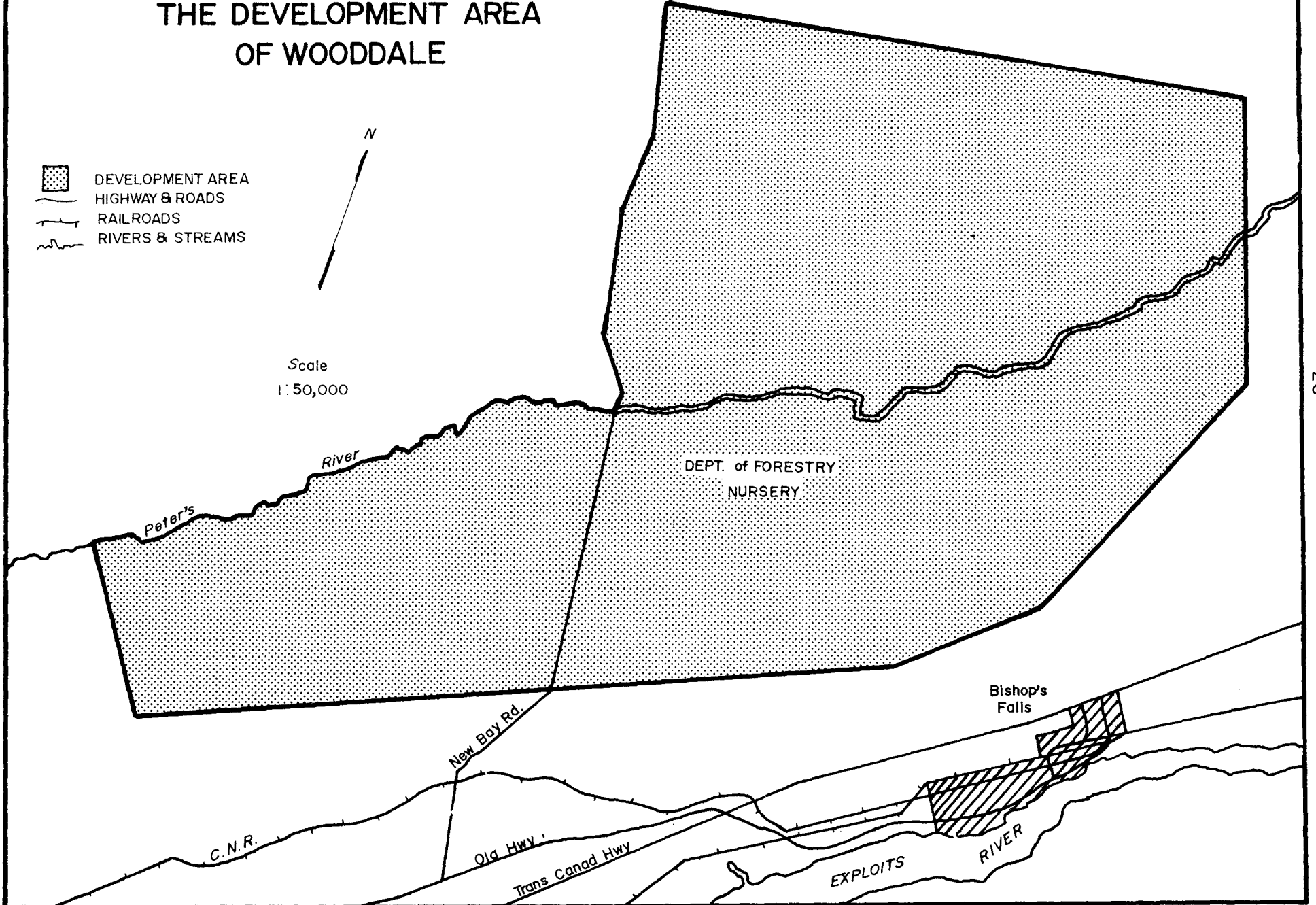


MAP NO.2 THE DEVELOPMENT AREA OF WOODDALE

-  DEVELOPMENT AREA
-  HIGHWAY & ROADS
-  RAILROADS
-  RIVERS & STREAMS







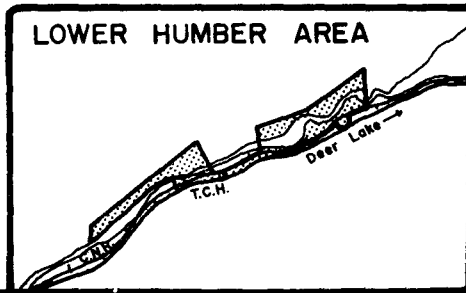
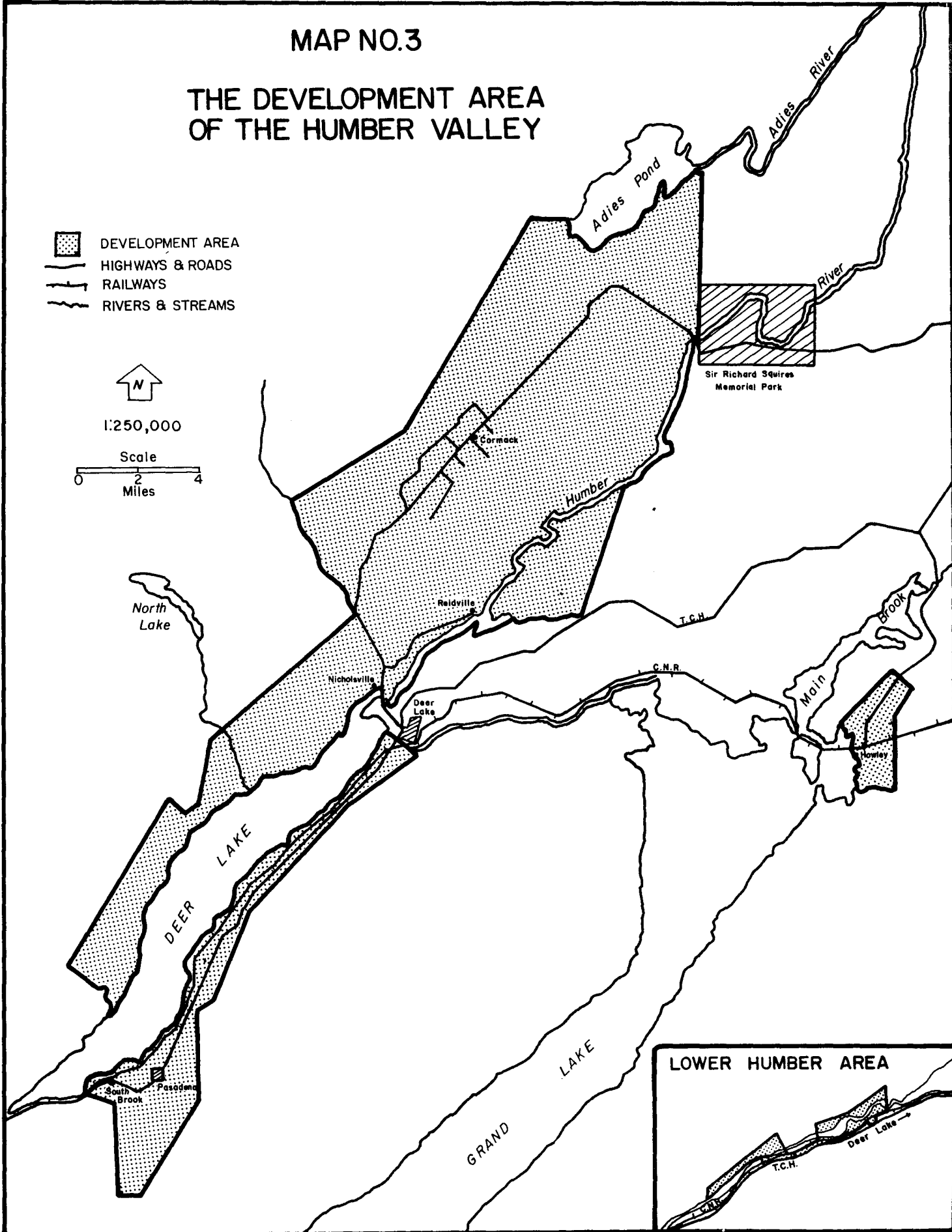
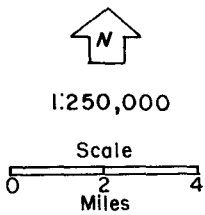
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MAP NO.3

THE DEVELOPMENT AREA OF THE HUMBER VALLEY

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RAILWAYS
-  RIVERS & STREAMS



MAP NO.4
THE DEVELOPMENT AREA
OF ROBINSONS-ST. FINTAN'S

ST. GEORGE'S BAY

Highlands

St. Devina

McKey

T.C.N.

Graben

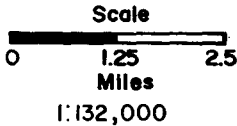
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Robinsons

Robinsons

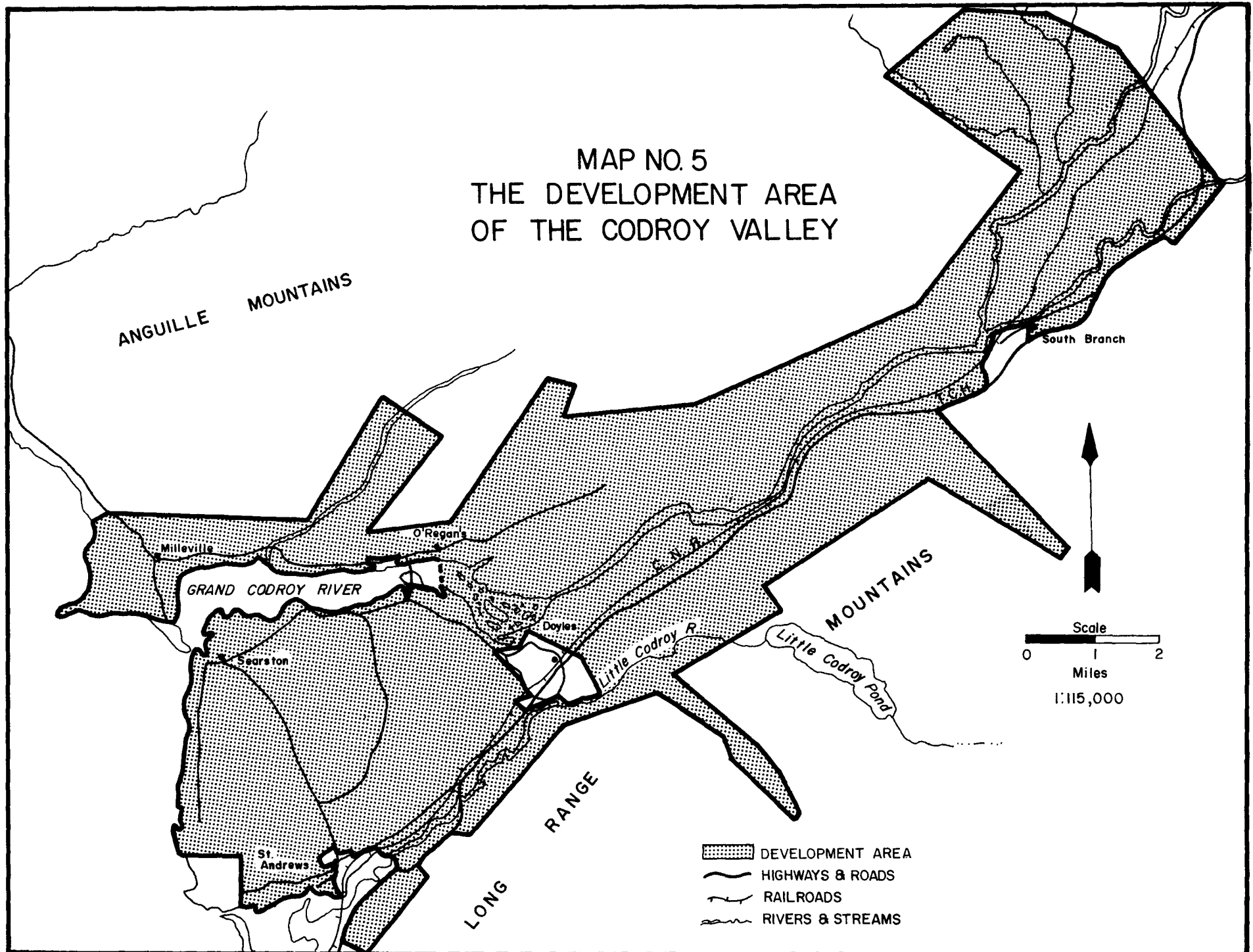
Barshale

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RIVERS & STREAMS



MAP NO. 5
THE DEVELOPMENT AREA
OF THE CODROY VALLEY

29



ANGUILLE MOUNTAINS

GRAND CODROY RIVER

MOUNTAINS

LONG RANGE

South Branch

Mileville

O'Regan's

Doyle's

Searston

St. Andrews

Little Codroy R.

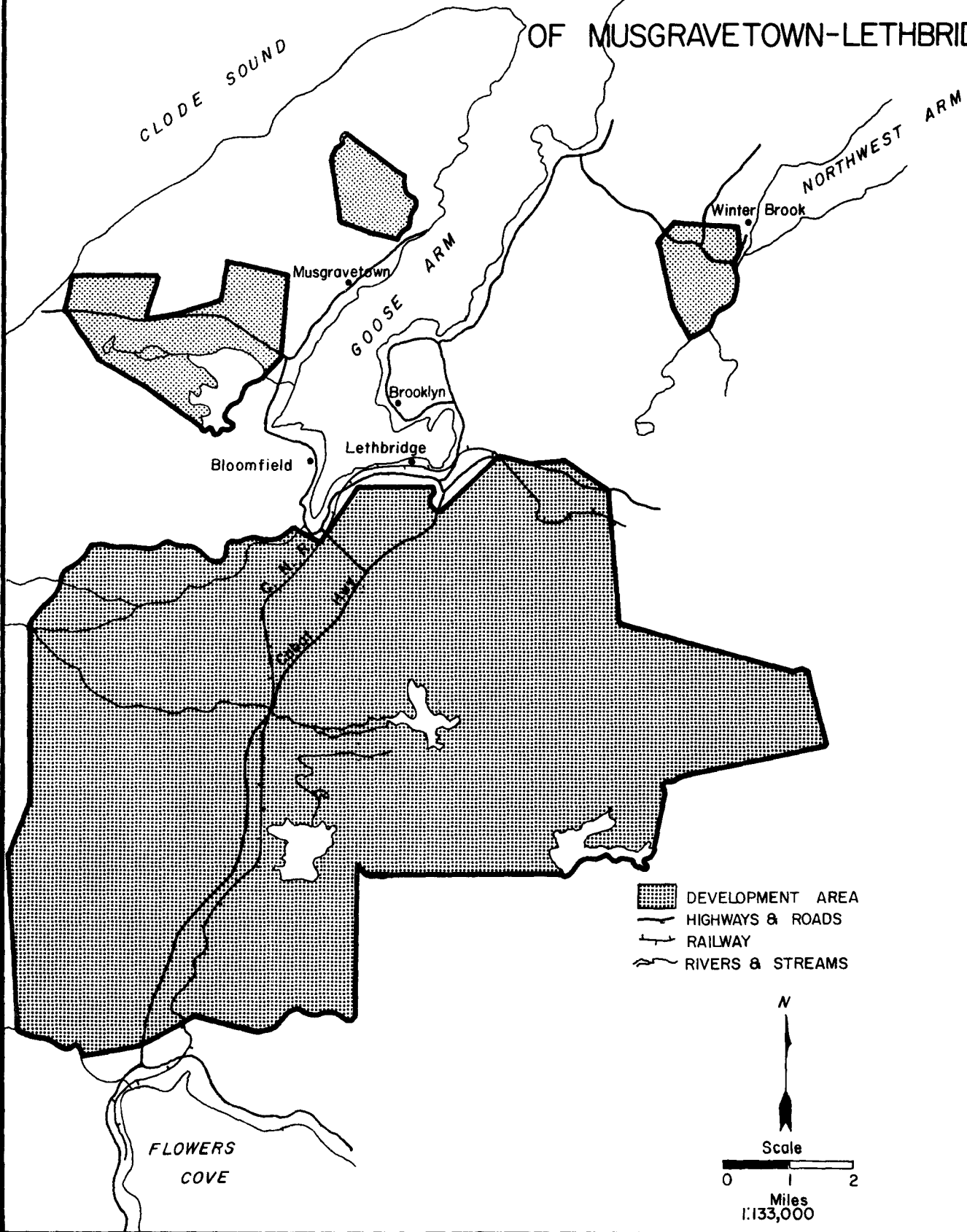
Little Codroy Pond

- DEVELOPMENT AREA
- HIGHWAYS & ROADS
- RAILROADS
- RIVERS & STREAMS

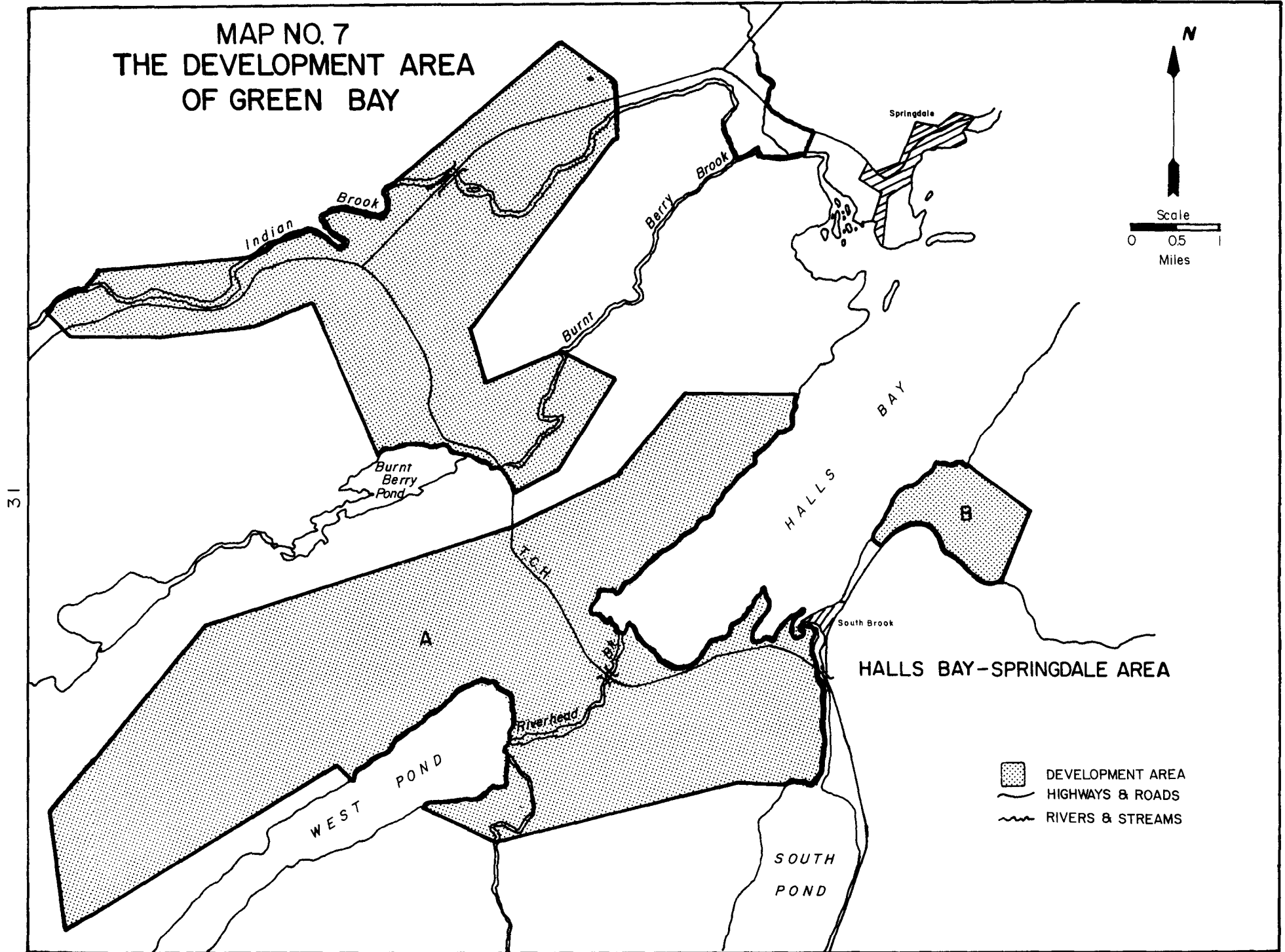
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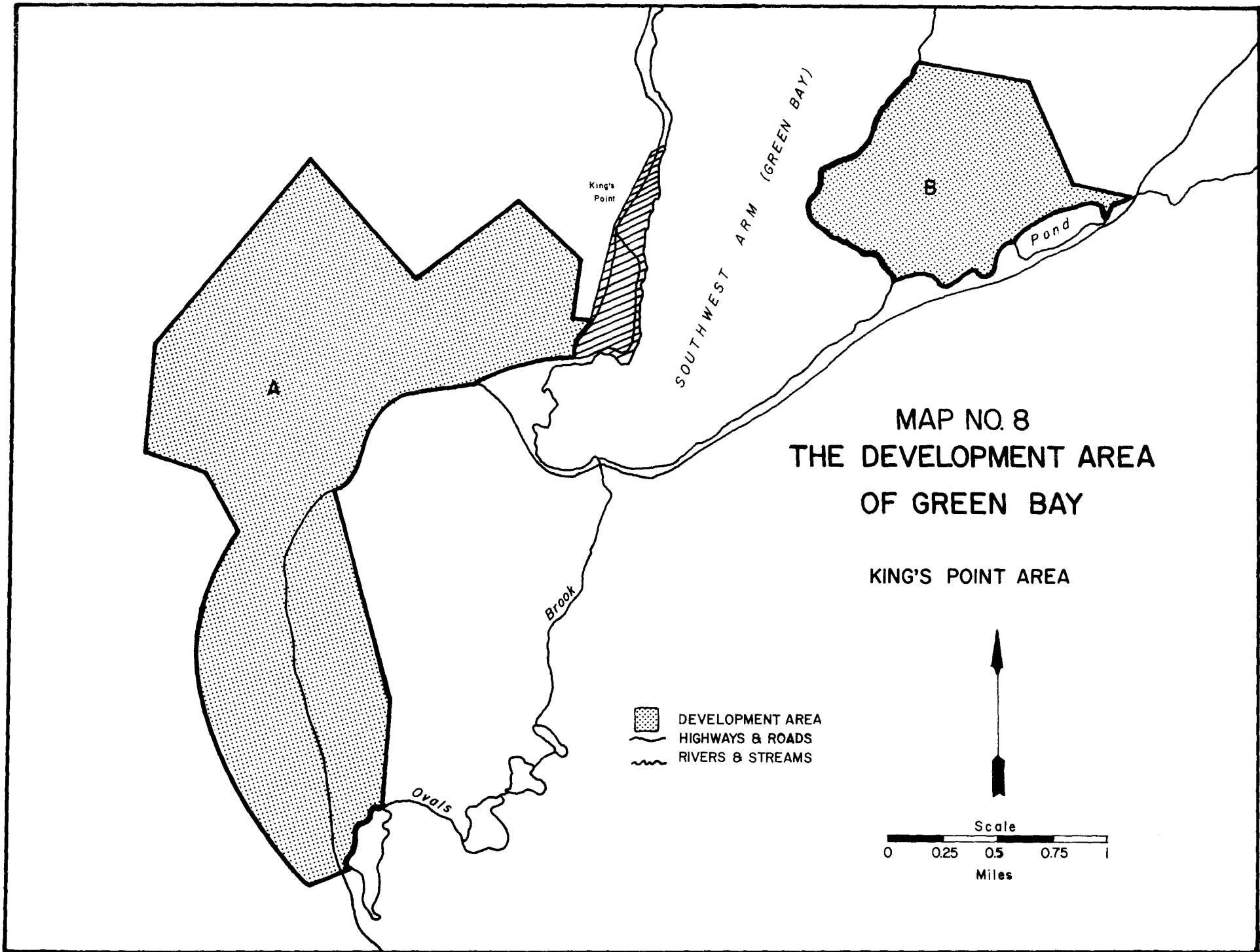
MAP NO. 6

THE DEVELOPMENT AREA OF MUSGRAVETOWN-LETHBRIDGE



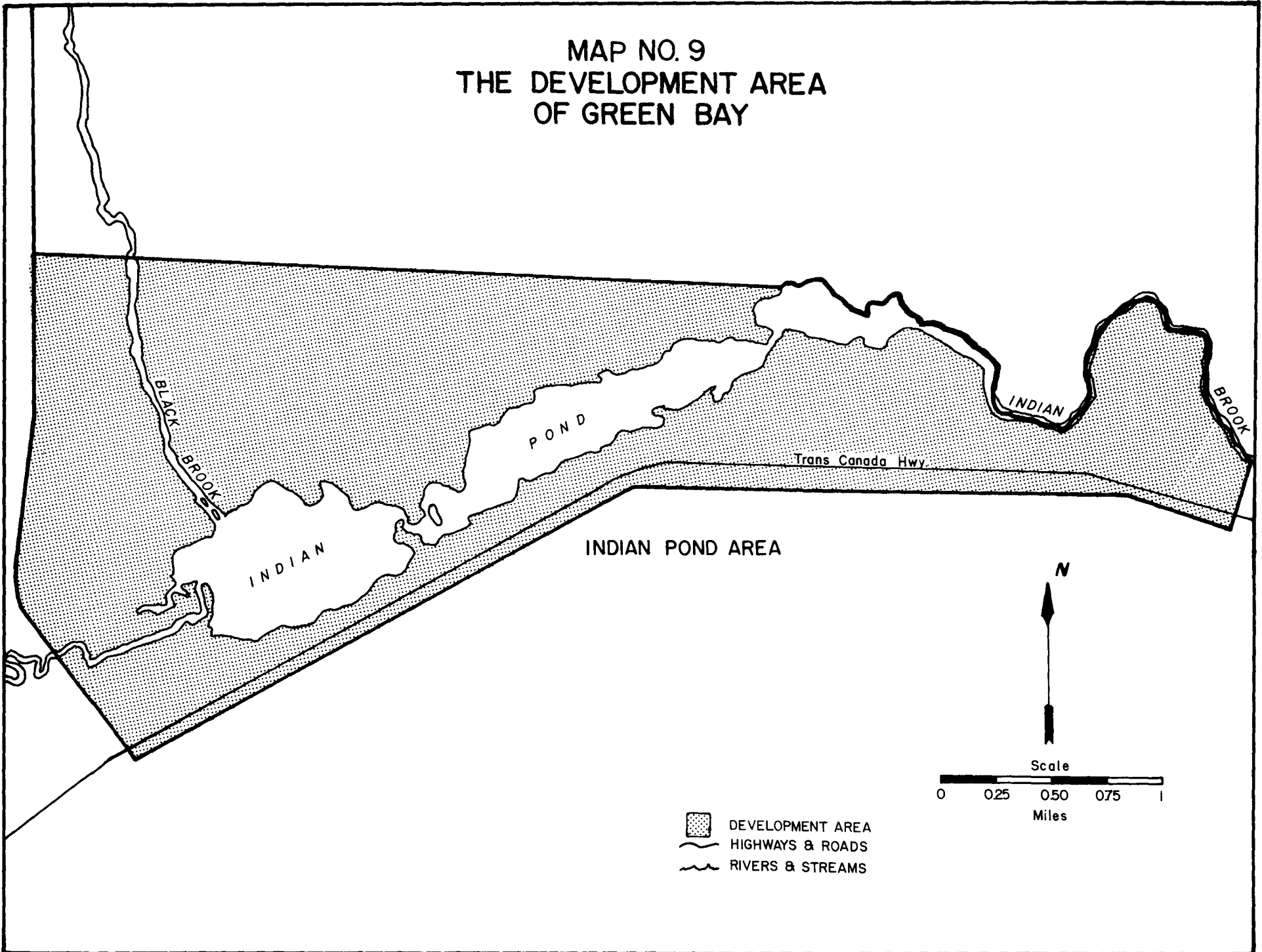
MAP NO. 7 THE DEVELOPMENT AREA OF GREEN BAY





MAP NO. 9
THE DEVELOPMENT AREA
OF GREEN BAY

33



BLACK BROOK

POND

INDIAN

INDIAN

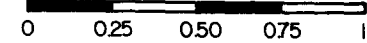
BROOK

Trans Canada Hwy

INDIAN POND AREA

N

Scale



Miles

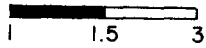
- DEVELOPMENT AREA
- HIGHWAYS & ROADS
- RIVERS & STREAMS

MAP NO.10
THE DEVELOPMENT AREA
OF PORT AU PORT

N



Scale



Miles

1:190,000

GULF
OF
ST. LAWRENCE

Montend




Lourdes

PORT AU PORT
BAY

Port au
Port

Abraham's Cove

ST. GEORGES BAY

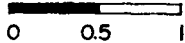
-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RIVERS & STREAMS

MAP NO. II THE DEVELOPMENT AREA OF WINTERLAND

N







Scale

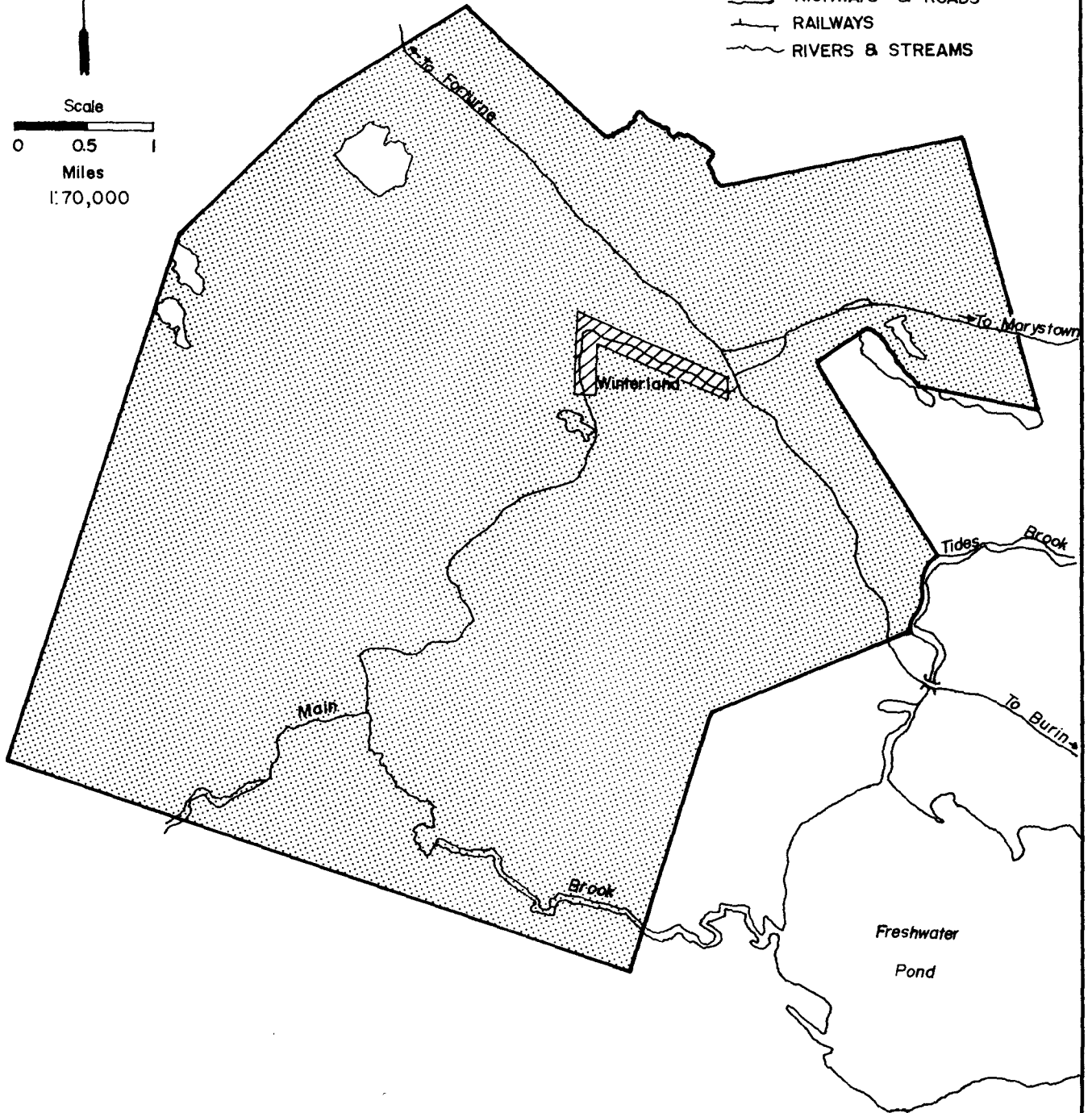


Miles

1:70,000

LEGEND

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RAILWAYS
-  RIVERS & STREAMS



MAP NO.12 THE DEVELOPMENT AREA OF BURIN

LAMALINE AREA

BURIN

PENINSULA






Scale



Miles

1:125,000

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RIVERS & STREAMS

Fortune

Grand
Bank
R.

Farthing
Bk.

Lawn
R.

Lawn

R.

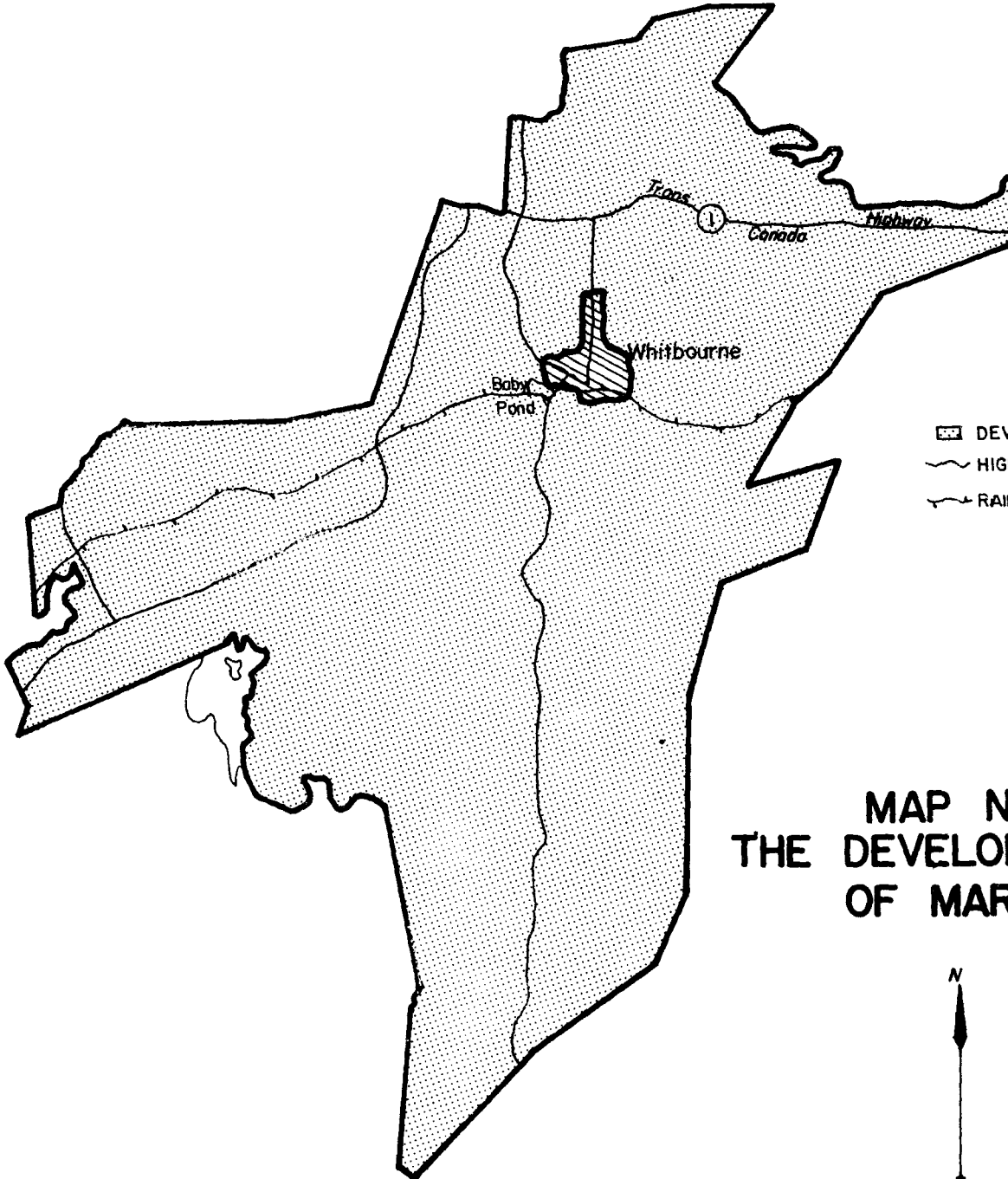
Lories

Bk.




Peters

Salmon
R.

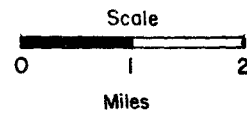
Islands

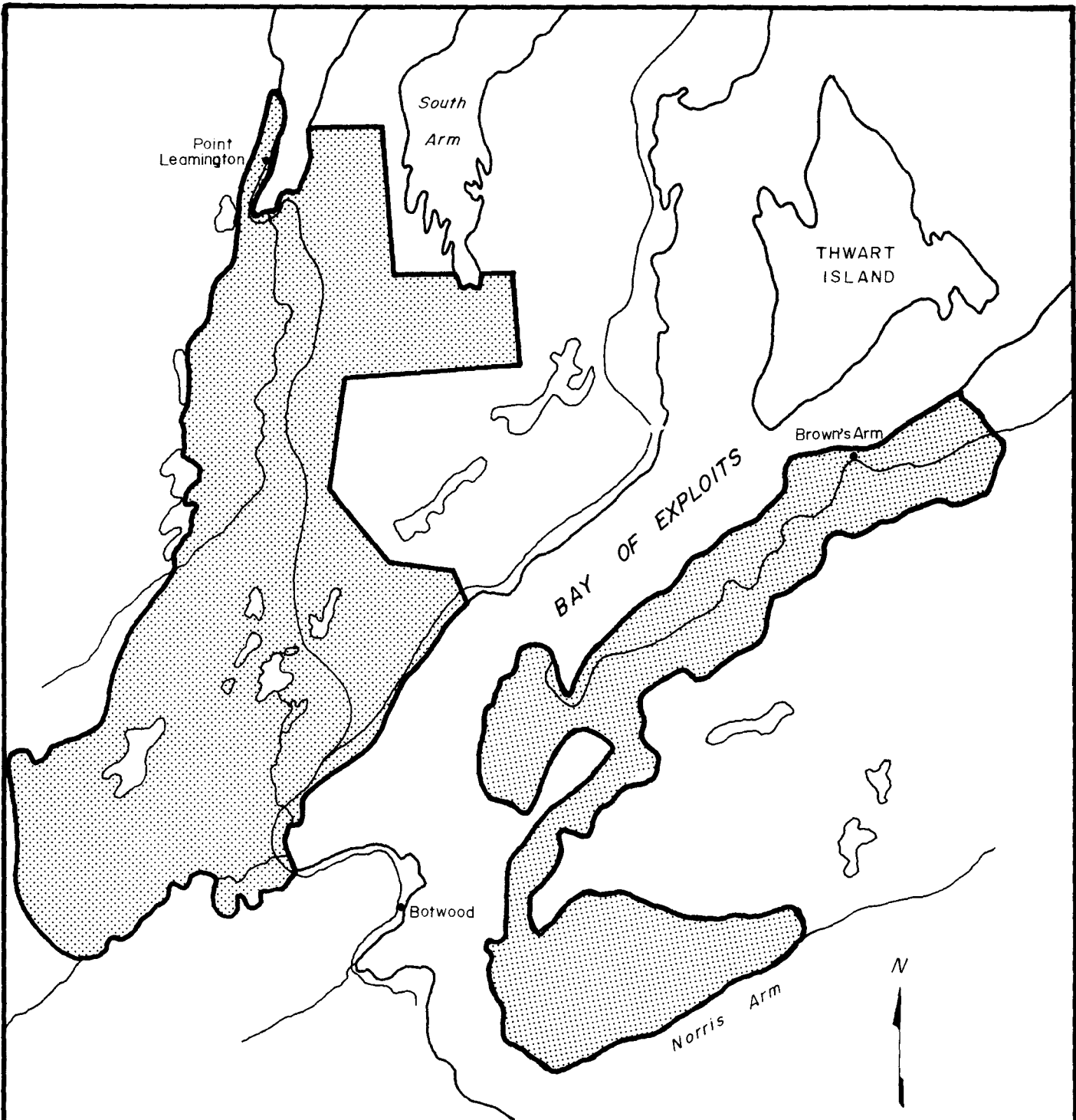


LEGEND

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RAILWAYS

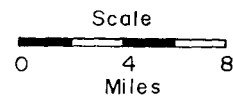
**MAP NO. 13
THE DEVELOPMENT AREA
OF MARKLAND**








MAP No.14
THE DEVELOPMENT AREA
OF LEWISPORTE

BROWN'S ARM — BOTWOOD AREA



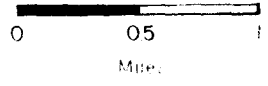
-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RIVERS & STREAMS

MAP NO.15 THE DEVELOPMENT AREA OF LEWISPORTE

Comfort
Island

N

Scale



BAY

of

EXPLOITS




COMFORT COVE AREA

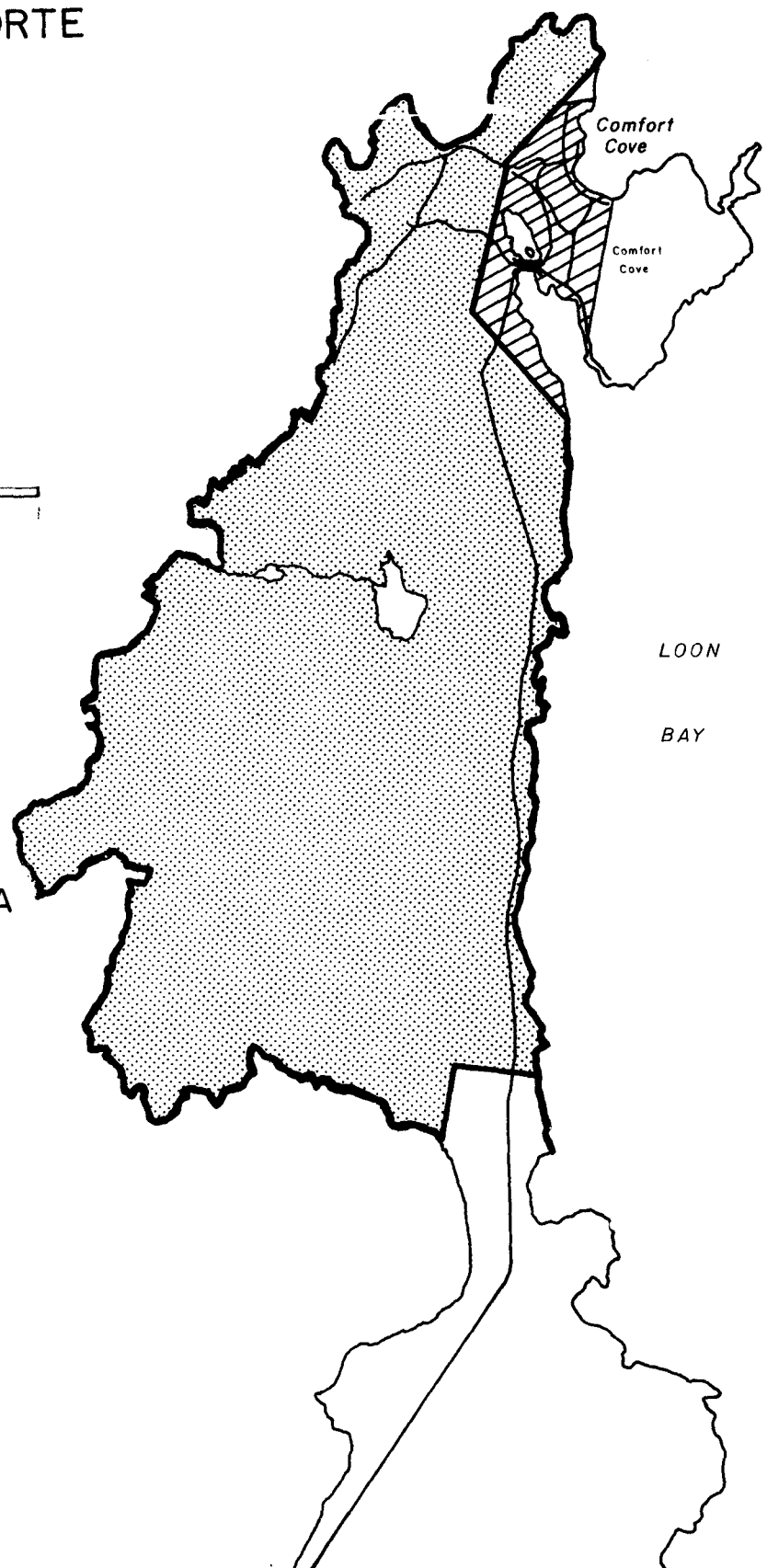
Comfort
Cove

Comfort
Cove




LOON

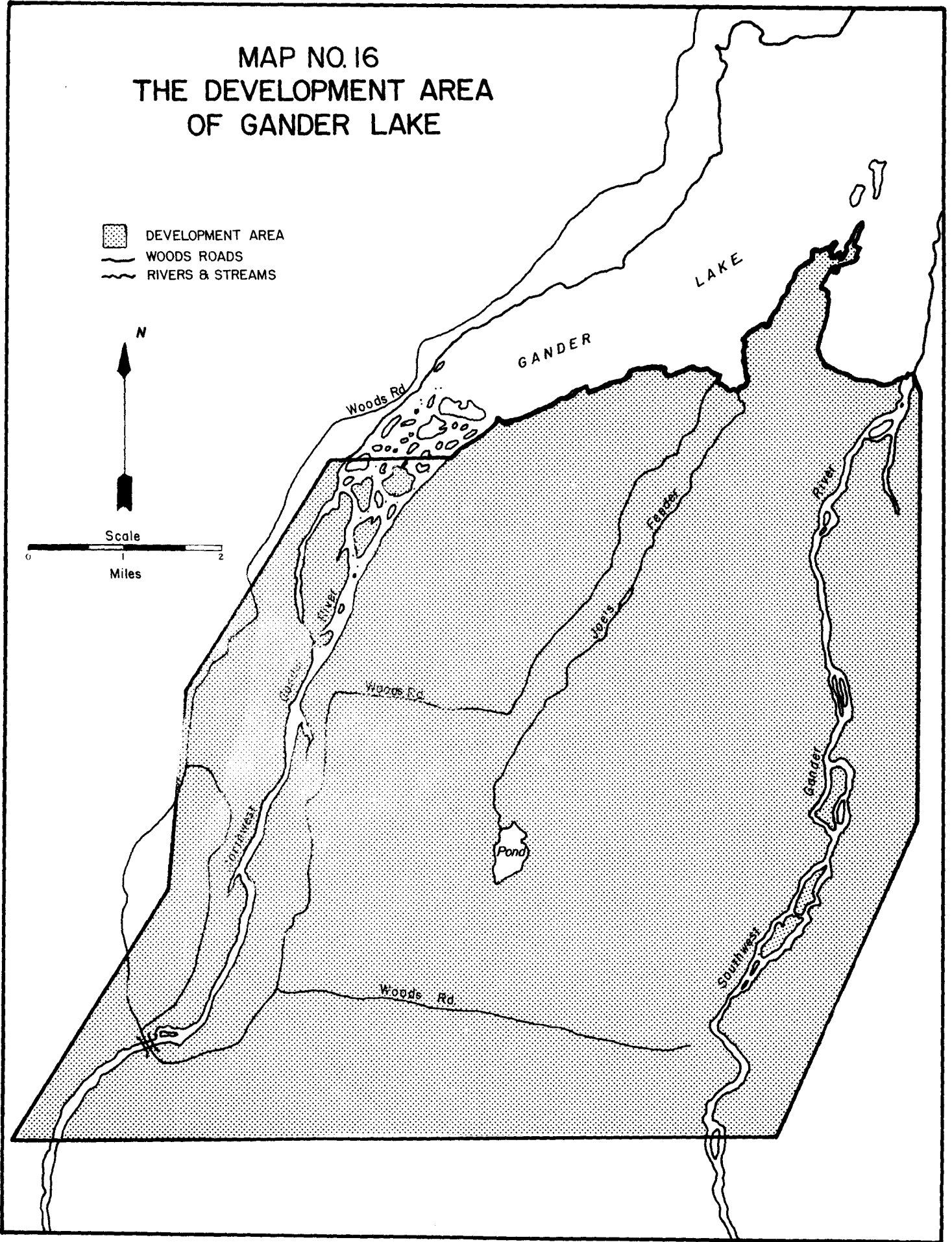
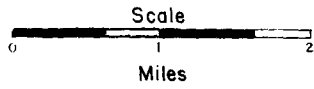
BAY

-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RIVERS & STREAMS



MAP NO. 16 THE DEVELOPMENT AREA OF GANDER LAKE

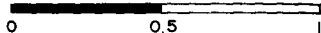
-  DEVELOPMENT AREA
-  WOODS ROADS
-  RIVERS & STREAMS



MAP NO. 17
THE DEVELOPMENT AREA
OF TERRA NOVA

N

Scale



Miles




41

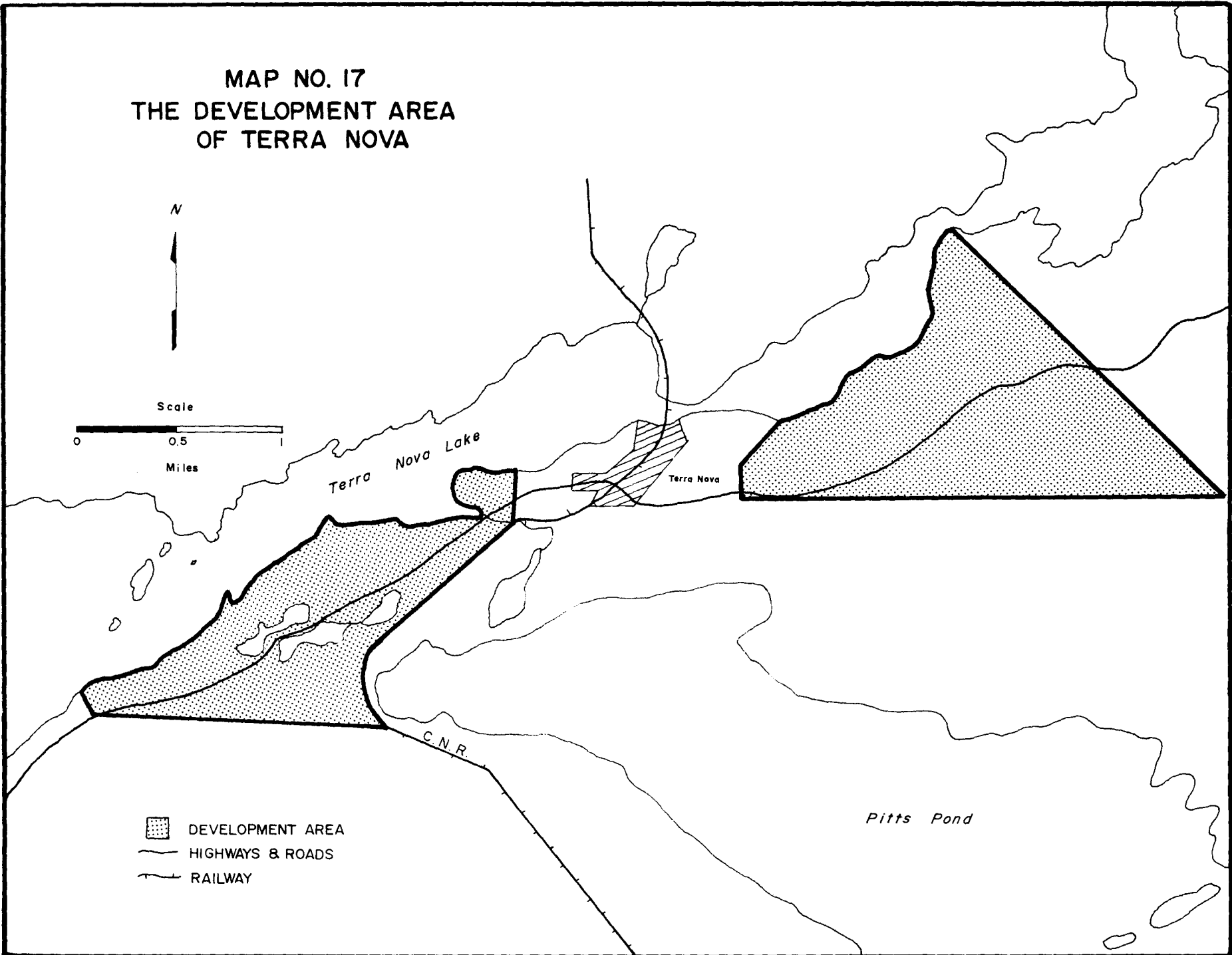
Terra Nova Lake

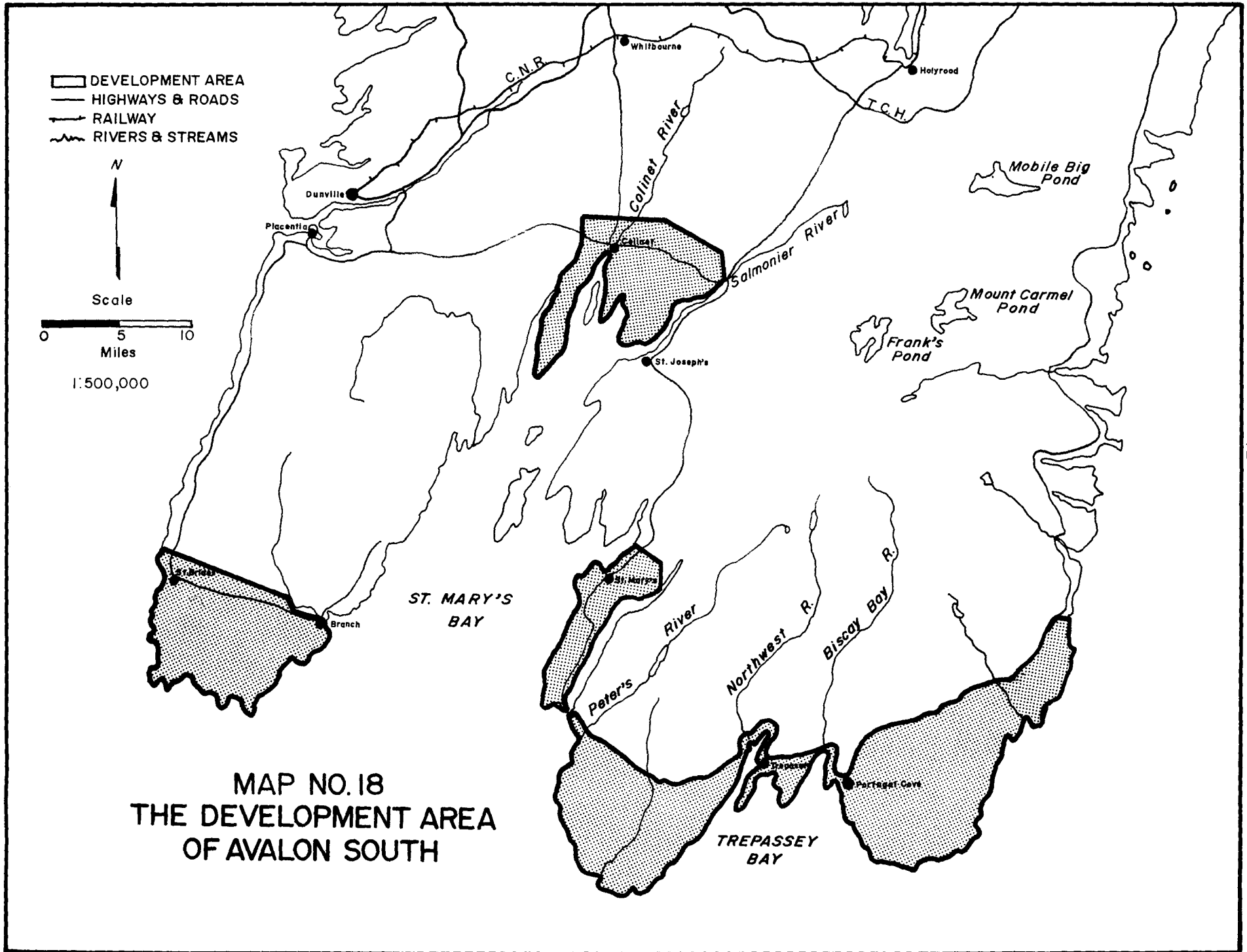
Terra Nova

C.N.R.

Pitts Pond

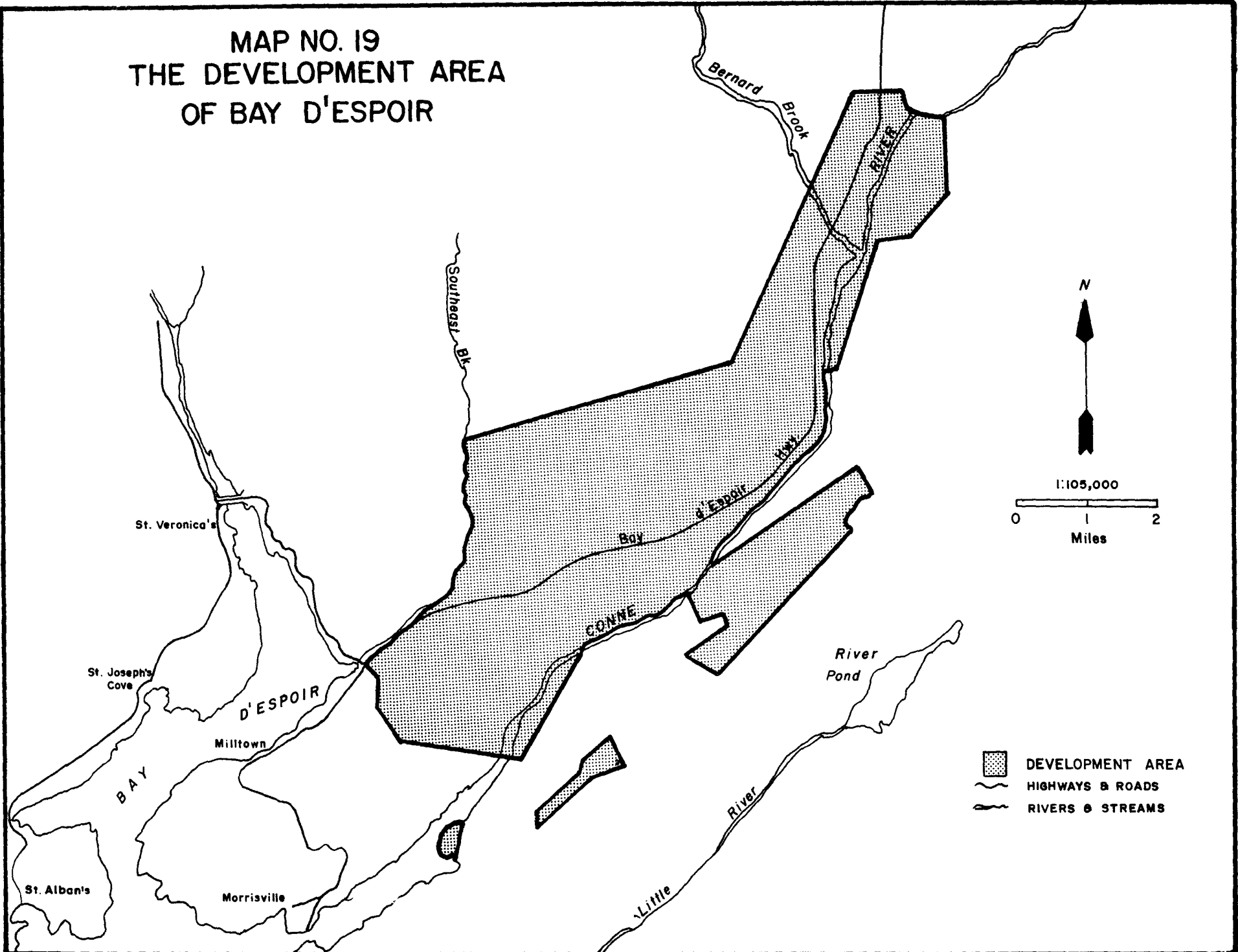
-  DEVELOPMENT AREA
-  HIGHWAYS & ROADS
-  RAILWAY





MAP NO. 19 THE DEVELOPMENT AREA OF BAY D'ESPOIR

43



N

1:105,000

0 1 2
Miles

DEVELOPMENT AREA
HIGHWAYS & ROADS
RIVERS & STREAMS