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and Northern Development

# Soils of the Cow Head Pasture Newfoundland

## Soil Survey Report 89-2 (Internal)



Soil and Land Management Division  
File No. 527.30

**SOILS OF THE COW HEAD PASTURE  
AREA, NEWFOUNDLAND**

**REPORT 89-2 (INTERNAL)  
NEWFOUNDLAND SOIL SURVEY**

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## SUMMARY

The proposed Cow Head Pasture area occupies 440 hectares. The area is composed of approximately 216 hectares of marine deposits belonging to the Sally's Cove soil association and 87 hectares consist of glaciomarine deposits of the Wood's Island soil association. Also present in this area, are 137 hectares of organic deposits of the Gull's Marsh soil association. These area counts are listed in Table 4. Both the Sally's Cove and the Wood's Island mineral soils have drainage ratings ranging from very poor to imperfect. The soil legend provides relevant drainage and slope class data associated with the above soil associations (Table 1).

The total area encompassing the boundary of Cow Head pasture is 440 hectares and of this area 123 hectares or 28% are rated good for rough pasture. Of this remaining area, 47 hectares (11%) are rated fair, 55 hectares (12%) are rated poor and 215 hectares (49%) are organic deposits and are not rated. Table 2 provides a list of rough pasture suitability rating by polygon number which in turn is correlated with Maps 1 and 2 showing polygon numbers and soil suitability ratings respectively.

## INTRODUCTION

This report describes the soil suitability for rough pasture of the Cow Head Pasture area. This site lies approximately 3 km north-northeast of the Community of St. Pauls on Newfoundland's West Coast.

Cow Head is an enclave of Gros Morne National Park. The Community of Cow Head proposes to use the area as a community pasture. Figure 1 illustrates the location of the Cow Head Pasture.

The soil survey was undertaken by the Department of Forestry and Agriculture, Soil and Land Management Division, as a request from the Cow Head pasture committee. The purpose of this study is to identify the areas most suitable for pasture development.

The area surveyed comprises 440 hectares. The boundaries used for the survey are approximate and do not conform to legal boundaries of the area.

## LOCATION AND PHYSIOGRAPHY

The area is located approximately 3 km north-northeast of the Community of St. Pauls, along the South beach of St. Pauls Bay. (Fig. 1). There are two main hummocky marine ridges both of which run in a northeast to southwest direction. Map 1 (located at the back of this report) illustrates that the westerly ridge is comprised primarily of soils from the Wood's Island Soil Association and the easterly ridge is mostly of the Sally's Cove Association. The area between these two ridges containing a substantial organic deposit of the Gull's Marsh soil association.

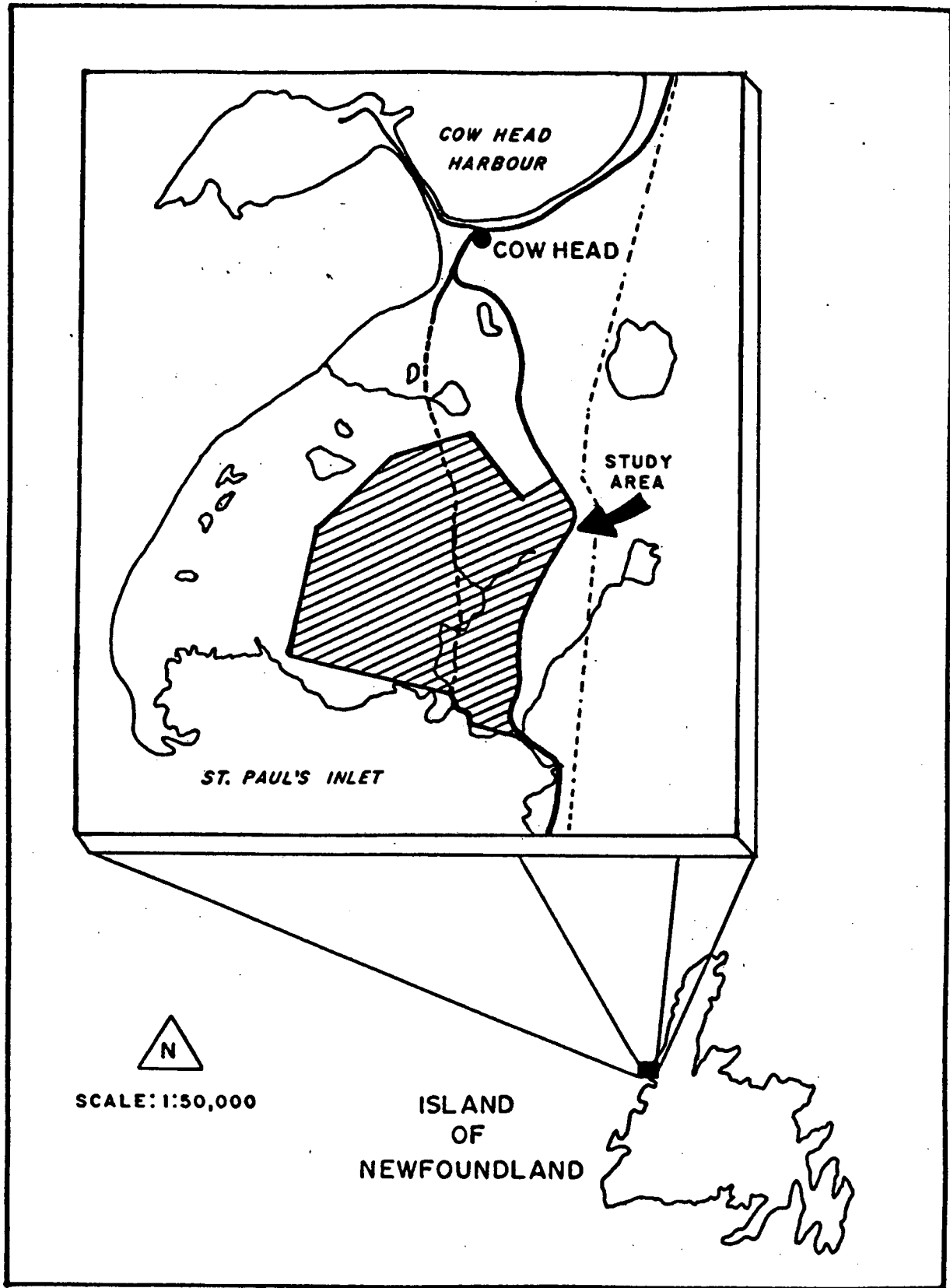


Figure 1. LOCATION OF THE COW HEAD PASTURE

Table 1:

## SOIL LEGEND FOR THE COW HEAD PASTURE

Polygon Number	Soil Associations	Wetland Class	Rough Pasture Suitability	Drainage	Slope Class	Area (acres)	Area (ha)
1	Org	Bog	Not Rated	Very Poor	V. Gentle	191.20	77.38
2	Org	Bog	Not Rated	Very Poor	V. Gentle	13.60	5.50
3	W/I	Peaty Phase	Poor	Very Poor	V. Gentle	19.80	8.01
4	Org	Bog	Not Rated	Very Poor	V. Gentle	3.40	1.38
5	Org	Fen	Not Rated	Very Poor	V. Gentle	32.50	13.15
6	S/C	Mineral	Fair	Poor	Gentle	49.80	20.15
7	Org	Fen	Not Rated	Poor	V. Gentle	35.50	14.37
8	Org	Bog	Not Rated	Very Poor	V. Gentle	53.40	21.61
9	Org	Fen	Not Rated	Poor	V. Gentle	11.50	4.65
10	Org	Fen	Not Rated	Very Poor	V. Gentle	9.60	3.89
11	S/C	Mineral	Good	Imperfect	V. Gentle	110.00	44.52
12	W/I	Mineral	Fair	Poor	V. Gentle	4.20	1.70
13	W/I	Mineral	Poor	Very Poor	V. Gentle	16.40	6.64
14	Org	Fen	Not Rated	Very Poor	V. Gentle	15.60	6.31
15	Org	Mineral	Not Rated	Poor	V. Gentle	3.60	1.46
16	Org	Fen	Not Rated	Very Poor	V. Gentle	11.70	4.73
17	Org	Fen	Not Rated	Very Poor	V. Gentle	73.40	29.70
18	Org	Mineral	Not Rated	Very Poor	V. Gentle	5.40	2.19
19	W/I	Mineral	Poor	Very Poor	V. Gentle	4.50	1.82
20	Org	Fen	Not Rated	Very Poor	V. Gentle	9.00	3.64
21	W/I	Mineral	Fair	Poor	Gentle	24.90	7.85
22	S/C	Mineral	Good	Imperfect	V. Gentle	114.20	46.22
23	S/C	Mineral	Poor	Very Poor	Gentle	4.50	1.82
24	S/C	Mineral	Poor	Very Poor	V. Gentle	7.20	2.91
25	S/C	Mineral	Good	Imperfect	V. Gentle	13.50	5.46
26	S/C	Mineral	Fair	Poor	V. Gentle	16.40	6.64
27	Org	Fen	Not Rated	Very Poor	V. Gentle	12.10	4.90
28	Org	Mineral	Not Rated	Poor	V. Gentle	6.20	2.51
29	Org	Fen	Not Rated	Very Poor	V. Gentle	7.60	3.08
30	Org	Fen	Not Rated	Very Poor	V. Gentle	35.10	14.20
31	W/I	Peaty Phase	Poor	Very Poor	Gentle	85.00	34.40
32	W/I	Mineral	Good	Imperfect	Gentle	36.40	14.73
33	W/I	Mineral	Good	Imperfect	Gentle	28.80	11.66
34	Org	Fen	Not Rated	Very Poor	V. Gentle	1.20	0.49
35	S/C	Mineral	Fair	Poor	V. Gentle	6.80	2.75
36	S/C	Mineral	Fair	Poor	V. Gentle	18.00	7.28
37	S/C	Mineral	Fair	Poor	Gentle	1.90	0.77

TOTAL

1093.90 440.47



## METHODOLOGY

Preliminary air photo interpretation using 1:12,500 scale black and white aerial photographs were used to locate soil boundaries. These were checked in the field wherever possible. A total of 40 sites were visited. Of these 40 sites, Table 1 illustrates the 37 separate soil polygons that were generated. Soils in the area were correlated as much as possible with existing soil series as defined in the Sandy Lake - Bay of Island Exploratory Survey, Newfoundland Soil Survey Report No. 11.

## SOILS

Three soil associations were defined for the area according to the lithology and mode of deposition of the parent material: Wood's Island, Sally's Cove and Gull's Marsh. In the eastern part of the area, silty marine deposits belonging to the Wood's Island soil association cover approximately 87 hectares (220 acres). The soils are generally imperfect to poorly drained and range in texture from silt loams to silty clay loam. Stones and cobbles are absent. The heavy texture of these soils reduce water infiltration and creates ponding of water. These soils occur on gentle and very gentle slopes.

In the western part of the survey area, a large ridge of sandy, gravelly and cobbly marine deposits belonging to the Sally's Cove association covers approximately 138 hectares (342 acres). These soils are generally imperfectly drained and some are of poor to very poor drainage; generally textures range from loamy coarse sand to very fine sand.

The area between the eastern and western ridge, is a large complex arrangement of organic deposits which are not rated according to the rating scale for soil suitability of rough pasture. These belong to the Gull's Marsh soil association and cover roughly 215 hectares (532 acres) which makes up approximately 50% of the pasture site. The slopes here are all classed as very gentle. The drainage range from very poor to poor and this is due primarily to the water holding capacity of the organic material at the surface.

Two types of organic deposits have been outlined within this report. A bog is made up largely from the remains of Sphagnum mosses and has very low levels of nutrient content. A fen is richer in nutrients than a bog and consists largely of sedge remains. In appearance, a fen is more meadow-like than a bog and has a greater variety of plants. The nutrients supplied to a bog generally come from the atmospheric precipitation and are called ombrotrophic. The fen on the other hand is called minerotrophic and receives nutrition from the surrounding mineral soil water as well as from the atmosphere. This basic concept explains the greater amount of available food for plants that inhabit a fen than for those that live on a bog.

#### SOIL SUITABILITY FOR ROUGH PASTURE

The soil polygons are rated according to their degree of suitability for use as rough pasture. A list of rough pasture suitability by polygon number is presented in Table 2. Rough pasture is grazing land planted to primarily introduced or domesticated native forage species that do not receive periodic

TABLE 2: LIST OF ROUGH PASTURE SUITABILITY RATING BY POLYGON NUMBER

Suitability Rating	Polygon No.	Area	
		Acres	Hect.
Good	11	110.00	44.52
Good	22	114.20	46.22
Good	25	13.50	5.46
Good	32	36.40	14.73
Good	33	28.80	11.66
Fair	6	49.80	20.15
Fair	12	4.20	1.70
Fair	21	24.90	7.85
Fair	26	16.40	6.64
Fair	35	6.80	2.75
Fair	36	18.00	7.28
Fair	37	1.90	0.77
Poor	3	19.80	8.01
Poor	13	16.40	6.64
Poor	19	4.50	1.82
Poor	23	4.50	1.82
Poor	24	7.20	2.91
Poor	31	85.00	34.40
* Not Rated	1	191.20	77.38
Not Rated	2	13.60	5.50
Not Rated	4	3.40	1.38
Not Rated	5	32.50	13.15
Not Rated	7	35.50	14.37
Not Rated	8	53.40	21.61
Not Rated	9	11.50	4.65
Not Rated	10	9.60	3.89
Not Rated	14	15.60	6.31
Not Rated	15	3.60	1.46
Not Rated	16	11.70	4.73
Not Rated	17	73.40	29.70
Not Rated	18	5.40	2.19
Not Rated	20	9.00	3.64
Not Rated	27	12.10	4.90
Not Rated	28	6.20	2.51
Not Rated	29	7.60	3.08
Not Rated	30	35.10	14.20
Not Rated	34	1.20	0.49

\* Not Rated: Relates to organic soils

cultural treatments such as tillage, mowing, weed control, and irrigation or drainage. Periodic fertilization may occur. Rough pasture is generally established on land that is unsuitable for forage production or other agricultural uses, due to topography limitations, stoniness, wetness, shallow soils etc. Four classes of soil suitability for rough pasture are used:

#### ROUGH PASTURE SUITABILITY CLASSES

- Good - The map unit is suitable for use as rough pasture. The soils of the map unit are relatively free of problems or limitations.
- Fair - The map unit is marginally suitable for use as rough pasture. The soils of the map unit have problems or limitations which can be overcome with good management and careful design. But costs should be carefully assessed.
- Poor - The map unit is poorly suited for use as rough pasture. The soils of the map unit have problems or limitations which are severe enough to make use questionable, because of continuing problems expected with its use.

The suitability ratings are based on certain soil characteristics which are easily identifiable and which are expected to influence the use of soils for rough pasture. Table 3 presents the suitability criteria used to rank the soils for use as rough pasture. The data collected for this area include potential rooting capacity, drainage, topography, boulders, stones, cobbles and coarse gravels. A soil depth of at least 25 cm over bedrock is considered sufficient to establish a good sod and not restrict rooting depth. A watertable at 20 cm depth during six weeks or more of the growing season will generally not restrict the growth of forage or cause trampling of the sod by animals. Slopes of greater than 30% are expected to decrease the uniformity of growth

TABLE 3: SOIL SUITABILITY FOR ROUGH PASTURE LAND

Major Soil properties influencing uses	DEGREE OF			SUITABILITY
	GOOD	FAIR	POOR	UNSUITABLE**
Potential rooting zone	>25 cm	<25 cm	<25 cm	
Available moisture	not affected by droughtiness.	Drought occurs in some years.	Drought occurs almost every year.	
Drainage	Well Moderately well Imperfect	Poor	Very poor	Inundated most of the growing season.
Topography	0-30%	30-60%	60-100%	>100%
Rock outcrops and/or large boulders*	<0-25%	25-50%	50-80%	>80%
Stones and boulders				
Coarse gravel and cobbles	0-60%	60-80%	>80%	
Gravel				
Erosion	Severe	Extremely severe		
Surface cover				Organic surface Cover 40 cm thick

\* % Surface coverage

\*\* There were no soils rated unsuitable in this study. The organic deposits of Cow Head are considered unsuitable for use as rough pasture, however, as there is no adequate system for rating organic soils they were 'not rated'.

and increase the potential for water erosion. A stone, cobble and gravel content (total coarse fragments) of more than 60% will limit the available space for rooting and nutrient holding capacity of the soil. Extremely severely eroded land, where more than 75% of the original topsoil has been lost from over 75% of the area because of sheet or till erosion, and/or the area is dissected by moderately deep to deep gullies with small areas of intact soil between the gullies, limits the area available for good sod production considerably.

In the Cow Head Pasture area, the imperfectly drained soils of the Sally's Cove and the Wood's Island Soil Associations are rated as good for use as rough pasture. The poorly drained soils of both the Sally's Cove and Wood's Island soil associations are rated as fair for rough pasture. Excess water during part of the growing season is the main limitation for these soils.

The organic Gull's Marsh soils have not been rated in this study. Map 2 is a schematic map showing the usable areas (rated as good and fair) for use as rough pasture. Table 4 shows the total area counts of soil suitability ratings for use as rough pasture.

TABLE 4: AREA COUNTS OF SOIL SUITABILITY RATINGS

Suitability Ratings for Rough Pasture	Area	Percent of Total Area (%)
Good	123 ha (303 ac)	28%
Fair	47 ha (122 ac)	11%
Poor	55 ha (137 ac)	12%
Not Rated	<u>215 ha (532 ac)</u>	<u>49%</u>
Total	440 ha	100%

### CONCLUSION

The main objective of this report was to complete a general overview of soils of the Cow Head pasture with the main emphasis on rough pasture production. The findings of this study are summarized in Table 2 in which the mineral soils are rated as: 123 hectares (303 acres) of good land, 47 hectares (122 acres) of fair land, 55 hectares (137 acres) of poor land, for the use as rough pasture. It finally should be noted that the large central portion of the area studied is organic soil and at present there is no available system for rating these soils hence the "not rated" classification.

