HECLA ISLAND ICELANDIC SETTLEMENT,

RE-ESTABLISHMENT OF A CULTURAL LANDSCAPE:

ANALYSIS AND LANDSCAPE MANAGEMENT

BY

OWEN BRUCE KJARTANSON

A Practicum
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Abstract

Beginning in 1875, Icelandic immigrants established a settlement in the wilderness on the west shore of Lake Winnipeg. In 1876 settlement spread to a large, low, wooded island with extensive wetlands. The settlement on the east side of the island came to be known as Hecla, and eventually the name was extended to the entire island. The Icelandic settlers came from a culture dependent on pastoral stock raising on the subarctic tundras and meadows of their mid-atlantic island, supplemented by fishing from small open boats. The new environment required new techniques and landuse patterns to create sustainable communities based on commercial fisheries and supplementary subsistence agriculture based on livestock raising.

The linear cultural landscape created by the evolving and growing settlement at Hecla is the focus of the study. Following expropriation of lands for park development and the loss of inhabitants and traditional land-use patterns the cultural landscape was transformed to a relict landscape. Although the cultural landscape was identified as a unique and valuable resource in park development plans, no comprehensive framework for the management and preservation of the cultural landscape has been proposed. By examining traditional land-use patterns, and visual and spatial patterns, the essential characteristics of the cultural landscape, as it existed in the past as well as at the present, were identified. The results were used to develop a set of proposals for reviving the cultural landscape. A management plan with the aim to preserve or recreate the essential characteristics of the cultural landscape is proposed. Fundamental to the plan is the establishment of a community that will bring the landscape to life. A cultural landscape is a living landscape that is sustainable, allows change and has its roots in cultural continuity. Recomendations are made for management of semi-natural vegetation, opportunities for restoration of structures, and re-inhabitation of the landscape as part of the process of re-establishing cultural practices.

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Section 1: Introduction

Hecla Provincial Heritage Park has important cultural resources that are worthy of preservation and interpretation. An important First Nations ceremonial site is located at Drumming Point on Black Island. However, the focus of the study will be on a more recent development—European settlement by immigrants from Iceland, and the cultural landscape they created on Hecla Island. A shoreline of low rocky headlands and bays with shingle or sand beaches is backed by a narrow strip of cleared land along the east shore of the island occupied by fields, homesteads, a saw mill, fish sheds and landing places. In the quarter century following park development, attitudes to the use and interpretation of the cultural landscape have changed and new opportunities and challenges have arisen.

A goal of the present study is to act as a catalyst for the development of a practical action plan for the medium term that addresses the concerns of the various interest groups, including the provincial park system that manages the cultural landscape, former inhabitants of the island and their descendants that have a personal attachment to the landscape, and visitors to the island who enjoy the landscape for its scenic and heritage values. The landscape is defined as a cultural landscape rather than a historic or heritage landscape in order to emphasis the role of the landscape as the physical manifestation of the continuing dialogue between a cultural group and the landscape that supports their way of life, rather than as a commemoration of a vanished past or museum of artifacts.

The cultural landscape is highly valued for its visual, aesthetic, and historic qualities. The cultural landscape expresses the interaction between natural landscape and human cultural behaviour. The people of Hecla Island created a landscape expressive of the harmonious relationship of people, lake, and land in a setting whose visual qualities depend on all three. Today the cultural landscape has an additional role to play as a

symbol of a scattered community and as a gathering place where the community may momentarily be reborn.

The cultural landscape of Hecla evolved as a result of the dynamic interaction between the culture of the inhabitants, physical resources of the landscape and external market forces. Icelandic immigrants brought with them a culture based on pastoral stock raising and fishing. In the very different landscape they faced in this new land, they adapted their material culture to use different natural resources, but were able to preserve the spirit of their culture. Later, changing market and resource conditions led to depopulation of the island and tourism was seen as the best hope to preserve the community. The people appealed to the provincial government for assistance and a proposal for a provincial park was born.

It has been twenty-five years since the original park plan was presented to the public and to the people of Hecla Island. During that time span the cultural landscape of the Hecla settlement has existed under a condition that can best be described as benign neglect. It is time that the cultural landscape received careful attention and study in order to develop a plan to preserve the essence of the cultural landscape for the future.

The initial proposal for the park called for development of an Icelandic fishing village as a centre-piece of the park to go along with recreational development at Gull Harbour at the north end of the island. This development was never carried out, and with the expropriation policy of the provincial government the existing settlement rapidly went into decline. Many of the structures in the settlement were moved or demolished at this time. During the 1980's structures in the village were restored and a historic interpretive trail was established. However the larger cultural landscape has survived through benign neglect more than any active management policy. Natural succession of the grassy meadows and pastures used by the inhabitants for stock raising, is beginning to have a major impact on the landscape with encroachment of secondary forest. The houses and accompanying outbuildings, farmyards and houseyards have suffered from lack of use

and accompanying neglect. Infrastructure developments associated with the development of the park have also intruded visually on the integrity of the cultural landscape. An interdisciplinary, holistic study will identify the factors important in shaping and maintaining the cultural landscape and those factors vital to the continuance of the cultural landscape as a dynamic system.

1.1 Importance of the Cultural Landscape

Hecla's cultural landscape is a unique example of the heritage of settlement and life in the Prairie region in its combination of distinctive culture, environment, form, and degree of preservation. Although this is the primary reason to preserve the cultural landscape in some form, an additional series of features add to the importance of the cultural landscape and the argument for its preservation.

1) The relationship of a people to their environment as revealed in the cultural landscape clearly expresses the symbiotic relationship between a people, the lake and the land.

2) The cultural landscape combines the three attractions of a rural or natural landscape in nearly equal proportions. Brotherton (1986) defines the three attractions as follows: country—"tamed and fertile landscapes over which man had asserted control," "'wild' attractions involve a reaction against this regularity and artificiality. The wild gives meaning by its very contrast with cultivation, the spread of which threatens and tames it," "'nature' attractions involv(e) the preservation of wild species" and the delight in viewing wildlife.

3) Hecla has never experienced the modern forestry and farming practices that have transformed the face of so much of our rural and natural landscapes since the Second World War.

4) The sense of time imparted by visual remnants of past occupation is important for the visual quality of the landscape and for understanding of the former culture and way of life. This experience is distinct from history, which is the intellectual or nostalgic examination of the past.

5) Hecla is of cultural importance to the islanders, their descendants and other New Icelanders. Cultural links are maintained through weddings, funerals, and reunions. Hecla has become a showcase to display their heritage. As other parts of New Iceland lose their distinctiveness, Hecla Island assumes importance as a symbol of a culture.

1.2 Process

Given that it is a worthwhile endeavour to preserve or re-animate the cultural landscape the following steps are necessary to gather the information and create a decision making framework needed to create a plan for the management of the cultural landscape.

1. Determine the frames of reference of the study.

- Define cultural landscape as a general concept and as it applies to the study.
- Define the scope of the study.
- Determine the goals of the study.

2. Gather background information on the Hecla settlement and for the entire island regarding:

- the people and history,
- settlement of the land,
- adaptation to the landscape and economic, agricultural and fishing systems,
- the natural resources of the land and waters and natural systems.

3. Define the study area where detailed analysis and planning will occur, based on:

- historical use patterns and land tenure,
- current features and road pattern,
- practical size for analysis and planning that encompasses the core of the accessible cultural landscape.

4. Analyze the cultural landscape to determine the essential characteristics that are necessary for defining the cultural landscape, and for planning and management decision making.

5. Develop a planning and management framework for re-animating the cultural landscape that ,

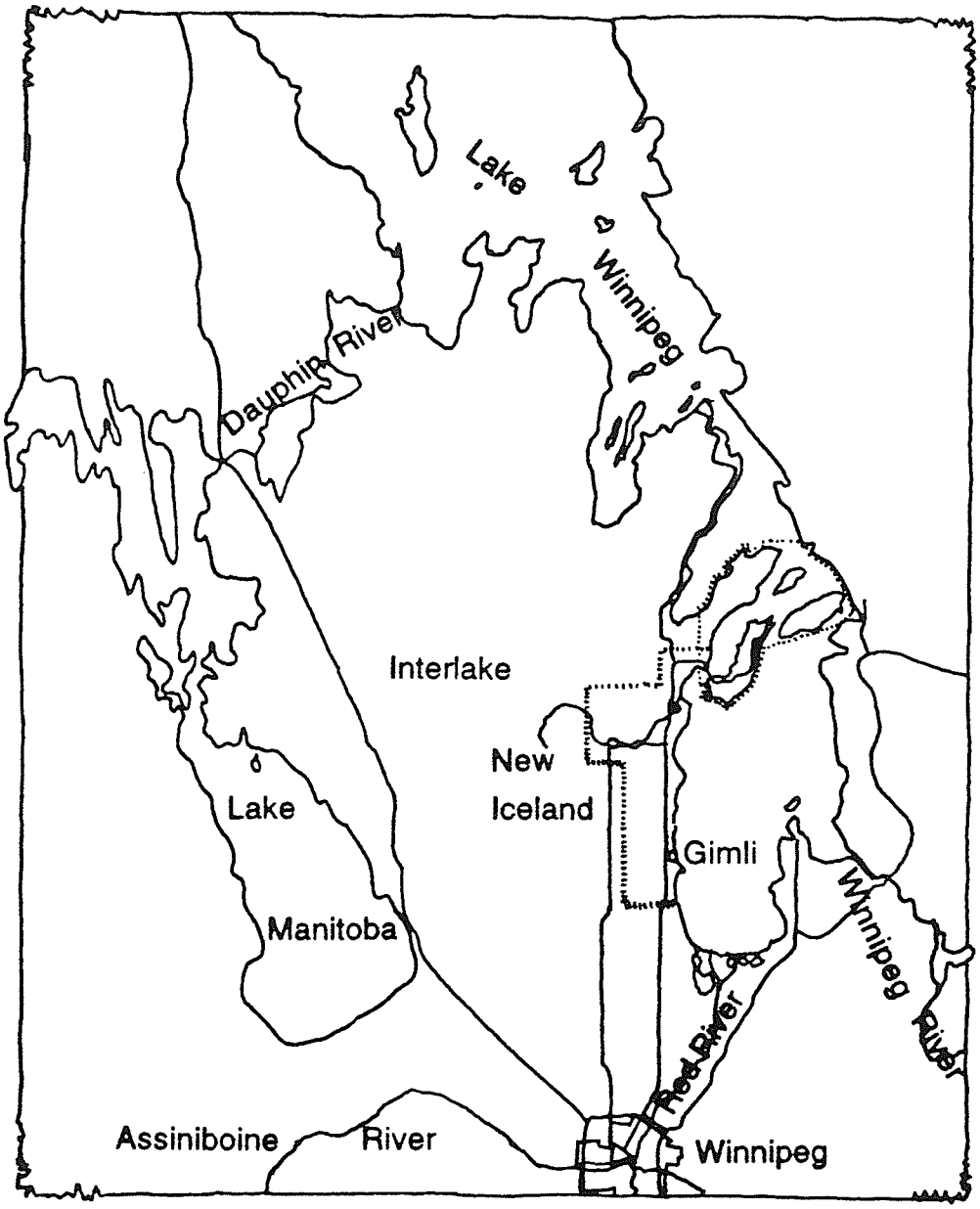
- explores options,
- has practical implementation strategies,
- is sustainable ecologically,
- strengthens the role of the cultural landscape in interpretation of the cultural, historical and environmental stories of the park
- has detailed management and design guidelines.

1.3 The Study Area

Hecla Island is a large island on the northern edge of the south basin of Lake Winnipeg in the province of Manitoba. It has an area of approximately 162 km^2 with a long axis of 25.6 km extending southwest-northeast, with an average width of 6.5 km. The island is approximately 150 km north of Winnipeg, the nearest large city. Hecla Island has been incorporated into a provincial park, along with nearby Black and Deer Islands, and numerous smaller islands scattered across the width of the lake. The island was first connected by road to the mainland in 1953 when a ferry service across Grassy Narrows was initiated. The island is now linked to Winnipeg and settlements on the west shore of the lake via Provincial Trunk Highway #8, over a causeway across Grassy Narrows. The causeway was completed in 1971. Road distance from Winnipeg to the north end of the island is approximately 165 km.

Detailed analysis of the cultural landscape is restricted to the area visible from the main shore road along the east shore of the island and its extension back to the limit of the farm lots. The main shore road stretches from the point where the highway joins the old shore road in the north, within the former farm at Steinessi, south to the road stretching back to the highway at Helgastaður, and beyond through several additional farms to the south. The study area is similar to the cultural heritage zone defined in the Hecla Management Plan (1988) but extends further south.

Figure 1. Location map of study area: Hecla Island, Manitoba.



1.4 Cultural landscape

'Cultural landscape' can be defined only by reference to the discipline or field that uses the concept. A cultural geographer, a landscape ecologist, a landscape architect, and a heritage planner all use the same words 'cultural landscape', but each has a different definition for what those words mean. Study of the cultural landscape on Hecla Island draws on concepts from each of these fields as needed to understand the cultural landscape and identify means for its re-animation.

1.4: i Definition of terms

Study of the origin of the words reveals the complex nature of the concept: 'cultural landscape.' 'Land' and 'scape' have come down to us from the Germanic roots of English and have their origins far back in time. According to Jackson (1984, p. 6), "the word (land) indicated any well-defined portion of the earth's surface. A small farm plot was a land, and so was a sovereign territory like England or Scotland." A contemporary dictionary defines land as: "**1a:** the solid part of the surface of the earth, **b:** ground or soil of a specified situation, nature, or quality, **c:** the surface of the earth and all its natural resources, **2:** a portion of the earth's solid surface distinguishable by boundaries or ownership: as **a:** country, **b:** privately or publicly owned land, **3:** realm, domain." The compound word landscape came to the English language from Dutch, originally meaning a painting of a pleasing view. Landscape has been broadening in meaning ever since. On one hand, it has been influenced by the passion first to seek scenic views in nature like those in paintings and subsequently by the attempt to recreate them in gardens, so we have landscapes and landscape gardening. On the other hand, the diverse meanings of land has resulted in the use of landscape as a more precise synonym for a defined portion of the Earth's surface in geography and related disciplines.

'Culture' undoubtedly is one of the words in the English language with the most diverse meanings. It can mean tillage of the land, an elevated or refined sensibility and

knowledge, the artistic inheritance of a society, or the integrated pattern of human behaviour passed down from generation to generation within a social group. The cross-cultural approach of anthropology has led to the recognition of culture as the whole way of life of a people as they relate to each other and to their environment.

The following definitions will be used in the study.
landscape: a defined section of the earth's surface with characteristic features formed by natural and / or human forces.
cultural landscape: a landscape where human behaviour patterns act as a co-evolutionary agent with natural forces on landscape development through time.

1.4: ii Interdisciplinary approaches to cultural landscape

Landscape Ecology

Landscape ecology is an "interdisciplinary science dealing with the interrelation between human society and its living space — its open and built-up landscapes." (Naveh 1984, p. xi) It is a holistic science, with land as its basic unit of analysis, expressing the dynamics of the natural ecosphere on the one hand, and human culture on the other. As such, it forms a "scientific basis for land and landscape appraisals, planning, management, conservation and reclamation." (Naveh 1984, p. xi)

An important feature of landscape ecology is its recognition of the pervasive nature of human influence on the landscape. The whole concept of a natural landscape had to be re-examined, and the degree of human influence categorized in a range of cultural landscapes. It follows that landscape can not be analyzed without taking the human factor into account.

The study of cultural landscape within the discipline of landscape ecology arose in the long settled lands of central and northern Europe, where cultural landscape history can be examined in an unbroken sequence extending into the past to the last Ice Age. Intensification of human use is reflected in the pollen record as forests are cleared, fields expand and disturbance increases. Historical research can document landscape change over the centuries. The landscape of Britain can be read as palimpsests with each layer of

use from Iron Age hill forts, to Anglo-Saxon furrow patterns, to 18th century enclosures still visible to the educated eye (Rackham 1988, pp. 53 - 78).

The North American landscape, on the other hand, has experienced a discontinuity as an immigrant civilization displaced the aboriginal occupancy. The displacement process is not as simple as it may at first appear. Sustained first contact exposed the original inhabitants to Old World diseases from which they had been isolated for at least 10 000 years. Lack of immunity to common diseases led to devastating epidemics. It is estimated that aboriginal populations fell by 90% from their pre-Columbian peak (Denevan 1992). Lower population base led to a reduction in intensity of land-use. Agricultural peoples adjusted to shifting cultivation combined with hunting and gathering activities. The landscape the first European explorers of the North American east coast saw was very different than that faced by the first colonizers one to two centuries later when aboriginal populations and intensity of land-use had dropped to a fraction of their previous level.

The discontinuity between aboriginal and European settlement has resulted in a perception that European settlement occurred in a wilderness. The settlement frontier in forested eastern U. S. and southeastern Canada occupied Indian fields and secondary woodland as well as so-called primeval forest. This perception has handicapped understanding of landscape history in North America. Typical models follow the sequence from wilderness to pioneer stage and so on to contemporary land-use. The effect of aboriginal occupance on vegetation history has been recently recognized. Biogeographic zones such as the Oak / Chestnut Forest are now recognized as fire climaxes maintained by burning to improve game and nut production (Pyne 1982).

The settled areas of the Prairie Provinces do approach the model of settlement in a wilderness, although even here the use of fire to prevent the encroachment of trees into the prairies was widespread.

In the specific site under study, aboriginal influence on the landscape was probably slight. The woodland cultures which occupied the region depended on gathering, fishing and hunting the resources of the natural environment. Exploitation was not intensive enough to produce landscape modification except locally around campsites. The study site did not have concentrated resources such as berry grounds, rapids where fish were caught, or a sheltered campsite, that would make it attractive to aboriginal inhabitants.

Cultural Geography

The dominant school of cultural geography in North America descends from the ideas of Carl Sauer, who in the course of his long career at Berkeley defined the scope of cultural geography. Cultural landscape is the impress of a culture on the medium of the natural landscape, evolving over time. Culture in this view is an independent agent, acting through individuals, at a higher or super-organic level (Jackson 1989). The logical extension of this approach is tracing the evolution of a culture by the spatial analysis of diffusion of cultural traits, such as dialects, house and barn types, origins of settlers, etc. These techniques have been dominant in cultural geography through much of the Postwar period. According to Jackson (1989), there have recently been trends to the analysis of the microgeography of cultural traits and the importance of the cultural strategies of the individual as revealed in minority and popular landscapes, and the spatial strategies of the many groups that together form the complexity of today's post-industrial cultures.

Ethnic Influence on the Cultural Landscape

Many immigrant groups have established islands in the general landscape of North America; cultural patterns unassimilated by the surrounding mainstream of culture leave their mark on the landscape. Conzen (1990a, p. 226) lists elements that can reveal the presence of an ethnic influence on the land, as follows, "placenames, different land division systems and road patterns, building traditions, farm layouts—including farmstead, field, and fence—nucleated villages, communal facilities, religious signatures, and such other special purpose structures as were needed for festivals and musical and

athletic activities." In the context of the expansion of settlement on the frontier, small and scattered ethnic settlements were likely to assimilate quickly and leave no trace on the landscape. The factors likely to produce an ethnic imprint on the land include large migrant flows, significant spatial cluster, isolation on the frontier, and strength of shared values among immigrants of the same background (Conzen 1990a, p. 239-241). Hecla Island, as part of the Icelandic settlement of New Iceland, satisfies all these criteria.

The establishment of ethnic neighbourhoods in cities and group settlements in rural areas has been well documented. The predominant mechanism for this process is a chain, whereby the first individuals communicate by letter to friends and relatives in the home district and encourage them to join them in the new land. Immigrants then settle in a cluster to enjoy the advantages of contact with experienced members of their ethnic group. Large group settlements in rural areas can have significant effects on the landscape by bringing settlement patterns, farming systems, house and barn types, etc. from the old country. A prime example of this is the so-called Pennsylvania Dutch area (actually settled by Germans from the Rhineland), which has endured as a distinct region for over 200 years (Conzen 1990a). The Canadian prairies were settled by peoples from many areas of Europe and North America, several of whom have created a distinct imprint on the landscape in their group settlements (Dawson 1936, Dick 1987).

The landscapes of the Mennonite reserves of southern Manitoba, the Ukrainian settlements on the parkland fringe of the prairies, the irrigation landscapes of the Mormon settlement near Cardston in southern Alberta, and the ranch landscape of the southwestern prairies influenced by Americans from the Great Plains and wealthy English ranchers are well known for retention of distinct landscape patterns (Dick 1987). Less well known are the Icelandic group settlements. The primary settlement, New Iceland on the west shore of Lake Winnipeg, spawned secondary settlements in the Argyle area south of Glenboro, in the Mountain district of North Dakota, several settlements near the shores of Lake Manitoba and in the Lake settlement centred on

Wynyard, Saskatchewan. As the largest and oldest of the settlements, New Iceland has retained the largest assortment of cultural traits (Einarson 1991).

Cultural Resources Management

Cultural Resources Management essentially has a mandate to preserve elements (whether they are artifacts, structures, former battlegrounds, historic urban districts, or landscapes) that are "associated with a historic event, activity or person," (NPS) and to interpret their historic value. It is primarily a public sector activity regarding the management of the historic resources owned or regulated by public agencies.

The definition of 'cultural landscape' used by the U.S. National Parks Service does recognize the inherent holistic character of a landscape by admitting the importance of 'other cultural and aesthetic values.' The Canadian Parks Service states that "resources that have *historic value* are called cultural resources. It is for this value that cultural resources will be safeguarded and presented for public benefit." (Environment Canada 1990, emphasis added)

A cultural landscape may have value for aesthetic, environmental, educational, or religious reasons as well. Additionally, a cultural landscape may illustrate the symbiotic relationship between a people and the land they inhabit. All these reasons have equal validity with historic value in deciding which landscape deserves protection.

The Manitoba Parks Branch recognizes the value of Hecla's cultural landscape for its historic value as 'the best remaining example' of New Iceland, a unique part of Manitoba's history. An unpublished report proposed a framework for evaluating, preserving and enhancing the historical structures, but no comparable framework for the cultural landscape as a whole. The extent of the recommendations regarding the cultural landscape is to stabilize the buildings in the cultural landscape zone and to maintain the landscape around historic structures.

1.4: iii Cultural landscape in the present study

Cultural landscape is part of the complex realm at the intersection of culture and landscape. Evolution through time at this intersection produces the contemporary cultural landscape which contains remnants of the past and is adjusted to present cultural processes. An interdisciplinary approach is necessary to take advantage of the insights of the various disciplines that meet there. The natural sciences of ecology, geomorphology, soil science, and other earth science disciplines provide the analysis of natural context needed to understand the landscape. The social sciences and humanities, including anthropology, cultural geography, and to some extent, history, provide the context needed to understand the people who lived in the landscape and their role in shaping it. An interdisciplinary holistic science such as landscape ecology provides a good model for understanding the cultural landscape as an integrated whole. For a landscape architect, the people, the places that were important to them, and the visual qualities of the things they built are also important. Finally, the overall visual quality of the landscape, its spaces and landforms, its colours and textures, its sounds, and its vistas, provide the basis for an analysis of the cultural landscape.

The approach to the study of cultural landscape employed in this study, mainly follows that of landscape ecology, with influence by the ideas of cultural geography.

The interdisciplinary, holistic science of landscape ecology provides an appropriate model for the study of a cultural landscape. The cultural landscape will be studied both horizontally, as a spatial pattern, and vertically, as a relationship between the layers reaching from the bedrock, through landforms, soils, natural and cultural vegetation communities and the superimposed human layer. The fourth dimension of time is also very important to the study. The evolution of the cultural landscape through time is important from the human perspective of respect for history and from a landscape ecological perspective as an important formative factor on the present landscape.

Humans in a cultural landscape play two different roles. One is their role in the 'Total Human Ecosystem' where their everyday activities impact on the other components as a factor in creating the landscape. However, humans are also actors in cultural space. Social interaction in a community of humans is aided by a cultural landscape which may be physically manifested or exist only as shared mental maps. Artifacts such as houses, community buildings and cemeteries and landscape features such as gardens perform an important communication function between the members of a community. They communicate the beliefs, values, and status of the inhabitants. Mental artifacts such as place names and mental maps are an important shared feature of the community, and are also part of the cultural landscape.

Section 2: The Hecla Settlement

2.1 Cultural context and history

Lake Winnipeg became part of the fur trade landscape in the early 1700's, continuing into the late 1800's. Contact with Hecla Island was confined to minor, local episodes such as voyageur campsites. The main canoe and York boat routes lay along the eastern shore, not adjacent to the island. In 1871-72 a Hudson Bay Company trading post was located at Grassy Narrows (Hudson Bay Company Archives), the strait separating the island from the mainland.

The growth of Winnipeg as a railway centre and gateway to the prairies pulled Lake Winnipeg into a hinterland role—supplying fish, lumber, and cordwood to the market. Logging began on the island in the early 1870's with the establishment of a sawmill. Settlement on the island by immigrants from Iceland beginning in 1876, led to intensification of land-use and the establishment of a cultural landscape. Resources of land and water provided subsistence and income. The way of life established there was based on proximity to the lake with its fish and access to transportation, logging the forests, and farming the limited areas of agriculturally suitable land.

2.1: i The Icelandic people

The Viking diaspora spread settlers to many lands in the 10th and 11th centuries. Diverse habitats and indigenous cultures were encountered. In the Kievan Rus, Normandy and Sicily the Norse culture was grafted on the top layer of society, with their cultural influence rapidly waning as they were assimilated. In the Danelaw of northern England, coastal Ireland and the Scottish islands, traces of Norse culture survive in local dialects and toponymy. The greatest impact was felt on the oceanic islands of the Faeroes and Iceland. Here Norse societies were transplanted to very sparsely inhabited or uninhabited lands. The environments found were not too dissimilar from those left

behind, but sufficiently dissimilar to require cultural adaptations to new resources and limitations.

The climate of Iceland is cooler and more oceanic than the migration source areas in western Norway, the Shetland Islands, and coastal Ireland. Iceland's cool summers limited tree growth and the fragile forests soon succumbed to overcutting and overgrazing. Cool summers also severely restricted grain crops and this basis of European agriculture was lost from Iceland's culture. The basis of Iceland's culture came to rely upon livestock which grazed upland pastures in summer and the homefields in winter, and on supplementary fishing. Settlement on individual farms was too sparse to support villages or towns. Government functions were dispersed spatially into the domains of headmen and concentrated temporally and geographically in the Althing, the early parliament of Iceland.

After the Danish takeover the settlement network became simplified into two layers: individual farms housing an extended family, their servants (if any), and perhaps a church, and a few tiny trading stations on the coast. During the emigration period from 1874 to 1905, the settlement network was starting to form a few fishing villages and Reykjavik was climbing to national dominance.

2.1: ii Traditional agriculture in Iceland

The agricultural system that the Icelanders evolved soon after their settlement period survived relatively unchanged until the end of the 19th century. If anything, it slowly deteriorated as various elements dropped out and the resource base declined under pressure from overgrazing. Iceland's population oscillated around a low level as natural disasters, famines and epidemics took their toll. Superimposed on this pattern was a steady decline as farms were abandoned due to soil erosion and loss of vegetation cover (Sveinbjarndóttir 1991).

The Landnám, or settlement period, occurred in an era of mild climate. Limited cultivation of barley was possible, as shown by the place name element, *akur* or arable

land, as found in Akureyri, Iceland's second city. However, deteriorating climate soon knocked this element out of Iceland's agriculture and grain cultivation was not part of the traditional agricultural system that Icelandic immigrants brought with them to Canada (Preusser 1976).

The traditional pastoral system in Iceland can be visualized as based on a series of concentric zones of decreasing intensity of land-use. The turf farmhouse and nearby cowshed formed the core of the farm. Sheep and horses were expected to make do with rougher shelter. Preusser (1976) divides the farm landscape into four zones. The Tún or 'home meadow' directly adjoins or surrounds the farmhouse and was used for the production of hay for cows. It was intensively managed with manuring to add nutrients, drained where necessary and mowed by hand. The first cut was in mid July and the second in the beginning of September. The 'home pasture' was sometimes used for hay but was primarily for grazing. In summer, cows with a small number of sheep and horses were grazed, and in winter sheep and some horses were kept out as long as snow conditions permitted. The 'outlying pastures' [heimagar], were mostly common lands, and provided summer grazing for sheep and horses, and transitional grazing before and after the period spent on high pastures. The High pastures [afréttir], were vital to the grazing system. By taking pressure off the lowland pastures, they allowed the production of hay needed to overwinter livestock. At the end of June or beginning of July, after the sheep were sheared they were driven up to uninhabited, common lands and allowed to graze unattended. In mid September, a roundup gathered the sheep and they were divided among their owners to be driven down to the lowland farms. Gardens were important to supplement the diet, but with a very limited selection of crops. Turnips were important, as were potatoes, especially after 1850.

2.1: iii Traditional fishery in Iceland

In traditional Icelandic culture fishing was a secondary occupation practiced by farmers to supplement their income. Most people lived on farms that did not have access

to coastal fishing grounds. About 15 % lived on coastal farms and practiced year-round supplementary fishing. Another 15 % lived in inland areas but traveled to the coast for seasonal fishing, usually for a few weeks during winter when there was less farm work (1703 census cited in Preusser 1976, p. 73). During the Danish trade monopoly accumulation of capital was very low and Icelandic fishing vessels were predominantly small open row boats. The fishing industry began to grow in the 19th century with the freeing of trade and especially after 1854 with the complete freeing of trade from the Danish monopoly. More and larger boats and sailing ships were built or acquired. The second half of the 19th century saw the establishment and growth of coastal communities. This development was concentrated in the southwest with its richer fishing grounds and year-round season. (Magnússon 1977, Preusser 1976) The real takeoff of the fishing industry and growth of fishing villages and urban settlements did not occur until after most Icelandic emigrants had left.

2.1: iv Cultural factors in choice of land

The immigrants to western Canada had no experience of town life, and no experience of field agriculture cultivating the soil and growing grains. Their experience in the home country coloured their expectations regarding suitable land for settlement. When the search party arrived in Manitoba most land was still open except for riverlots along the Red and Assiniboine Rivers and the Mennonite Reserve lands. They could have chosen lands in the fertile open prairie of the Red River Valley or on higher ground west of the Manitoba Escarpment. Instead they chose land they felt could better support their culture.

The lands they chose had several advantages: 1) the area was outside the boundaries of the province of Manitoba and could have a separate administrative structure, 2) it lay along the shore of a great lake teeming with fish, 3) it had an abundance of wood, a luxury in a treeless land like Iceland, 4) there were good natural hay lands in the marshes along the lake shore, 5) the soil, especially along the Whitemud River (later the

Icelandic), was deep and black as they had seen at the Red River Settlement, 6) the projected course of the CPR through Selkirk to the Lake Manitoba Narrows lay only a few miles to the southwest of the colony boundary, and 7) there was access by boat to the settlements along the Red River (Jonasson 1901).

The experience of Icelandic homesteaders at Foam Lake, Saskatchewan related by Hufferd (1980) is instructive regarding the persistence of farming systems in the immigrant settlements on the Prairies. This district was a tertiary settlement founded in the late 1890s and early 1900s by settlers from the Churchbridge district, an offshoot of earlier settlements in Manitoba. Contact with other settlers who sought land for grain growing had not converted them to a new agricultural system and instead they sought land which could support their culture, that is "hay ground, pasture, and lakes full of fish ... the sites in which they took interest—the shores of lakes, marshy old lakebeds, lands that were necessarily sandy and prone to occasional flooding—were sorts of places considered by other landseekers in the region to be of little or no value."

2.1: v Icelandic settlement in North America

The nineteenth century was a time of demographic expansion in Iceland and population pressure began to be felt on the limited resources of the island. The emigration wave sweeping Europe as part of its demographic transition inevitably made itself felt in Iceland. A very few had emigrated previous to 1870 to such places as Brazil and Utah. However, only in the 1870's did a self sustaining flow begin to North America.

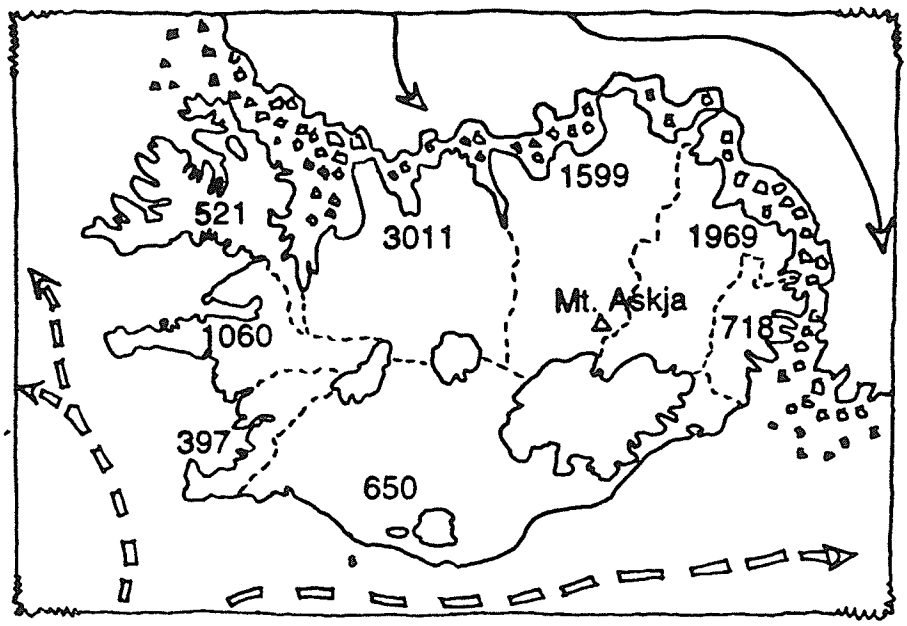


Figure 2: Iceland, regional sources of emigration, with warm and cold currents, pack ice and location of Mt Askja. (Source: modified from Juliusson et al. 1992. Íslenskur Söguatlas)

Most emigrants came from northern and eastern Iceland, see figure 2. Climatic deterioration with cold weather, blizzards, and poor growth of pastures and hay, was especially severe in this region because of the influence of the East Iceland Current in bringing pack ice to the coasts of north and east Iceland. The 1875 eruption of Mt. Askja in East Iceland, devastated the pastures and hay the herds depended on, leading to famine conditions. The decade of the 1880s saw the worst conditions of climatic deterioration and therefore the most emigration. Most emigrants came from inland areas where there was less access to fishing as an alternative occupation. Fishing settlements first began to emerge in the southwest of Iceland (Preusser 1976), providing an alternative to emigration in south and west Iceland not available to the people of the north and east.

The first immigrants in the 1870s found their way to many scattered localities on the fringes of settlement in eastern North America; including the Muskoka area of Ontario, Nova Scotia, and Wisconsin. The letters that these first emigrants sent to friends and relatives in the home district convinced more people in Iceland to try their luck in the new continent. The prospect of a sizable movement convinced several in the community in Ontario that a place should be located for a group settlement, allowing the Icelanders

to stay together. According to Jonasson (1901), the deciding factor in choosing the Canadian Northwest rather than the American Midwest, was the personal interest of two men, one, an Ontarian interested in the new Canadian acquisition of the Hudson Bay Lands, and the second, Lord Dufferin, the Governor General, who had been favourably impressed by the inhabitants during a visit to Iceland. A party was chosen to inspect lands in the Canadian northwest. They enquired about land available within a 100 mile radius of Winnipeg. The delegates examined the west shore of Lake Winnipeg as a potential colony site. The land selected was duly settled and christened Nyja Ísland, or New Iceland. This first settlement provided the spark drawing Icelandic settlers to the Canadian Prairies. Manitoba still has the largest population of Icelandic descent outside of Iceland. New settlements appeared as migrants from New Iceland and immigrants from Iceland sought better opportunities in Winnipeg, the major urban area, in other areas with resources of fish and hay such as the shores of Lake Manitoba, and prairie lands such as Mountain, North Dakota and Baldur, Manitoba.

2.1: vi History of New Iceland

Following the selection of a site, the Icelanders headed west from Ontario, via the Great Lakes to Minnesota, during the autumn of 1875. By the time they reached Winnipeg it was already October, but they decided to continue to their destination. The first winter was very hard but the next summer brought a new, large group of immigrants and with them new hope. A smallpox epidemic the next winter severely set back the colony. There followed a short period of growth before the low point in the colony's history. Floods from high waters on Lake Winnipeg and factional conflict between the followers of two different religious leaders lead to a severe depopulation as people abandoned New Iceland for new settlements to the south and west. Renewed immigration in the late 1880s and 1890s brought the colony back up to strength and the arrival of the railway and growth of the fishing industry brought, if not prosperity for all, at least the opportunity to earn a decent living.

Prior to the arrival of the railway, agricultural progress in New Iceland was necessarily limited. The immigrants lack of experience with grain agriculture could be overcome, but the lack of access to markets could not. Hufferd (1980, pp. 90-91), in discussing a similar situation in the Icelandic settlement in the Foam Lake area, observed that "improvement in transportation and shipping facilities ... influenc(ed) traditional pastoralists to begin growing wheat. ... Thus, here, as elsewhere in the prairies and surrounding areas, the growth of commercial grain production and the expansion of the rail net were inextricably linked." Access to the railway had the effect, not only of bringing the outside world closer, but of changing the way people went about their everyday lives and how they made their living. Rail access brought the wheat economy to the mainland of New Iceland, however Hecla remained a culture based on pastoral agriculture and fishing.

2.1: vii Cultural landscape in New Iceland

The influence of the Icelandic settlement on the landscape of New Iceland is evident in many subtle but pervasive ways. The most obvious influence is on toponymy—place names of Icelandic origin abound. The two local governments in the area are the Rural Municipalities of Gimli and Bifrost. Both names have their origin in Norse mythology. Most of the villages and hamlets of the district have names derived from Icelandic. Gimli, Husavik, Arnes, Hnausa, Geysir, Vidir, Arborg, and Hecla fit this pattern. The most important exception is Riverton, which has successively been known as Lundi, Icelandic River and Riverton. In the Canadian Prairies, names for new villages and towns were usually bestowed by the railway company or the Post Office. Only groups which established their settlement before the arrival of the railway, such as the Mennonites and the French Canadians of the Red River Valley and the Icelanders of the Interlake were able to establish place names reflecting their language and culture. Natural features with established names became known by new, Icelandic names as

settlement took hold. For example, the Icelandic River used to be known as the Whitemud River and Hecla Island was known as Big Island.

The Icelanders were able to modify the township and range land division system to a small extent to accommodate their need for access to water. Along the Icelandic River and the shore of Hecla Island, homesteads were modified from the standard square 160 acre quarter section to 160 acre homesteads that were typically one quarter mile wide by one mile deep and accommodated within the rectangular survey grid. This model may have been influenced by familiarity of the Icelanders and surveyors with the river lot division of land along the Red River.

Because settlement in Iceland lacked some features common to most agricultural cultures, traditions did not exist in the home country and had to be adopted by example or experimentation in the new land. Iceland had no roads or villages. Wood and building stone were too scarce for use in construction of ordinary structures. The Icelandic building tradition was based on the use of turf block construction. On arrival in New Iceland with its abundant supplies of wood, new building techniques based on log, and later frame construction, had to be adopted wholesale. Later this became literally true with widespread availability of industrially manufactured building components. Iceland was just beginning to establish coastal fishing and service villages when emigration was initiated. There was no traditional village form that could be adopted when the need arose. Three townsites were surveyed during the initial survey of the settlement in 1876 at Gimli, on the Icelandic River and at Sandy Bar (which never became a nucleated settlement). Hecla village grew without any formal structure as an intensification of the linear settlement pattern that evolved on the island.

2.1: viii History of Hecla Island

Big Island received its first settlers with the arrival of the large group of immigrants to New Iceland in 1876. The island location was advantageous to the early development

of fishing and contact with the outside world via lake steamers. The potential of the mill to provide employment was only intermittently realized.

The island shared in the religious controversies and floods that depopulated New Iceland in the late 1870's and early 1880's, but ready access to fishing grounds and some work in logging and mills ameliorated conditions. The development of the fishing industry on Lake Winnipeg in the 1880's and especially the 1890's brought a measure of prosperity and security to the island community.

2.2 Adaptation to the new landscape

2.2: i Location of the settlement

Location of settlements, settlement pattern, and type of land-use all depend to a certain extent on the natural context within which a cultural landscape evolved. The main settlement zone on the island was located in the area most favourable to settlement. Elevation of the shoreline above lake level is perhaps the best predictor of settlement around the shores of Hecla Island. Low shorelines along the western and southern shores were vulnerable to flooding from high lake levels and early homesteads were soon abandoned. The shoreline between the main cultural landscape zone and the Gull Harbour area is dominated by precipitous cliffs and saw only sparse settlement. The main cultural zone has shorelines high enough to escape flooding, but not so high as to preclude easy access to the water. Through time the homesteads clustered in the present cultural landscape zone, with outliers to the north at Gull Harbour and a few scattered on the east shore south of the main settlement area.

Areas of agriculturally suitable soil are scattered in small patches around the island. The cultural landscape zone is situated on one of the two or three largest contiguous patches. An additional factor favouring this location, and also Gull Harbour, is ready access to the main shipping channel on the lake which passes just east of the island. This locational advantage was cemented by the construction of government wharfs at their present locations in Hecla village and Gull Harbour.

Settlement Pattern

The linear settlement pattern was influenced by the distribution of resources in a gradient extending back from the lakeshore. The lakeshore itself provided access to transportation and to the fish resources of the lake. The most fertile, best drained soils were typically located adjacent to the lake, where relief allowed surface and groundwater drainage. The mixed forests of the lakeshore graded back to treed muskeg with

increasingly poor drainage further inland. The most equitable distribution of land with equal access to resources was achieved by dividing the land so that each farm received a narrow slice extending back from the lake. The hay marshes of the west side of the island, although not part of the home farm lot, were also necessary resources for almost every farm.

2.2: ii Use of the resources of land and water

Land Use and Subsistence

The resources of several ecological zones were exploited in the fishing/farming system that supported the settlement. The commercial economy was primarily based on the exploitation of the fish resources of the lake, both locally and in distant fishing camps. Production of grain from arable fields is possible but with restrictions due to cool summer weather and marginal, poorly drained soils. Competitiveness of commercial grain production was hindered by transportation difficulties and thus never became part of the farming system. Subsistence was primarily based on stockraising that relied on natural hay meadows and pastures cleared for grazing. Forage grasses are more productive than grains in a relatively cool, moist climate. Exploitation of the forests and marshes also contributed to support of the community. Much of the forest on the island was cut over to supply sawmills in the community. Wild resources of the island also contributed through the sale of furs and the gathering of wild foods and materials.

2.2: iii The land and waters

Lake Winnipeg

By surface area, Lake Winnipeg is the world's 13th largest lake, and Canada's 6th largest, with an area of 24 390 km^2. Lake level lies at 217 metres above sea level. The lake is divided into two large basins with a channel connecting them, known as The Narrows. The larger and deeper north basin, has a flat bottom 16.5 to 18.5 m deep, with several islands of moderate size in the open basin. The Narrows has a complex

morphology with large shallow bays on the west side, a central channel and a few deep troughs. The south basin is saucer shaped with a flat bottom at a depth of 12 to 13 m and is uninterrupted by islands. The lake extends 416 km from south to north. Its drainage basin of 984 200 km^2 extends to four provinces and two states. Its major tributary the Saskatchewan River, rises in a number of headwaters in the Rocky Mountains of Alberta and flows through central Saskatchewan to enter Lake Winnipeg at Grand Rapids. The Winnipeg River is the second major tributary. It drains the forests of southeastern Manitoba, northern Minnesota, and southern Northwestern Ontario. A third major river, the Red, enters the lake from the south after draining a very large, but semiarid to subhumid, drainage basin in southern and eastern Saskatchewan, northern and eastern North Dakota, northwestern Minnesota, and southern Manitoba. Lakes Winnipegosis and Manitoba also drain into Lake Winnipeg via the Dauphin River.

Navigability

Ship and boat traffic on the lake is limited by lack of navigability on the rivers that link it to markets and resources. During the fur trade era, canoe and York boat routes followed the rivers radiating to and from Lake Winnipeg, making the lake an important link in the east-west and north-south fur trade routes. During the steam era, steamboats plied the Red River between Minnesota and Winnipeg. Rapids limiting navigation from Winnipeg to the lake were not overcome until the opening of the Lockport dam and lock in 1911. The portage at Grand Rapids limited access to the Saskatchewan River. Steamboats plied the river to Edmonton before competition from rail ended the prairie riverboat era. The steep drop and turbulent rapids of the Nelson as it flows to the sea, make it completely impractical for navigation.

Lake Winnipeg was a busy highway for freight and passenger traffic before the extension of roads along its shores and to northern Manitoba in the post war era. The main shipping channel passes between Hecla Island and Black Island. All shipping from the north passed Hecla Island on its way to Selkirk or Winnipeg on the Red River, or to

the pulp and paper mill at Pine Falls on the Winnipeg River. Grassy Narrows separates the island from the mainland to the west. It is quite shallow and can only be used by shallow draft vessels.

Gull Harbour, at the northeast end of the island, is an excellent natural harbour protected from three sides. A small artificial harbour has been developed at the government wharf in the village.

Physiography[1]

Manitoba is located on the stable continental platform underlain by Precambrian rock that forms the core of the continent of North America. In most of Manitoba the sedimentary cover has been removed exposing the Canadian Shield. In the northeast, the Hudson Bay Lowlands remain, and the southwest includes the edge of the great Interior Plains of North America. The Manitoba Lowlands lies between the high ground of the Manitoba Escarpment to the west and the Shield to the east and north. The bedrock of the lowlands is primarily Paleozoic carbonate rocks. The physical features of the Manitoba Lowlands have been extensively modified by glaciation and subsequent occupation of the basin by Lake Agassiz. The Manitoba Lowlands are predominantly flat lying with extensive lake clay plains, rougher but still low relief till plains, and large shallow lakes that are remnants of Lake Agassiz. The Interlake region within the Lowlands is noted for its limestone till forming a ground moraine that is extensively molded into drumlinoid features. Low lying areas of the plain, such as the Icelandic River basin and Hecla Island received moderate deposits of Lake Agassiz clay. The fine grained sediments of the lake clays are relatively impermeable, creating extensive wetlands and poorly drained woodlands.

Hecla is low lying with significant relief confined to shoreline areas. Low cliffs are found on headlands on the east and north shores, culminating in the 25 m cliffs at the north point. Wave erosion and deposition have extensively modified the shoreline of the

[1] Information on physiography from: Canada Land Inventory 1973, Smith et al. 1975, Weir 1960, & personal observation.

island. Longshore drift has created two major spits, Sandy Point at the southwestern corner of the island and Lighthouse Point protecting Gull Harbour. Shoreline cliffs were created by wave erosion cutting back into bedrock. Elsewhere boulders eroded out of glacial till give graphic evidence of shoreline retreat. The shoreline of the cultural landscape is quite stable. However, the sediment carrying capacity of the longshore current is graphically illustrated by the infill of sediment on the south side of the government dock.

Cliffs expose the limestone bedrock of the island. Hecla Island is underlain by rock of Ordovician age, 500 to 440 million years old. Dolomitic limestone of the Red River Formation overlies sandstone and shale of the Winnipeg Formation, which is exposed on Black and Deer Islands.

Lake Winnipeg was excavated during the Pleistocene ice age. Ice from the Laurentian icesheet eroded the contact where the resistant Precambrian shield dips below relatively softer sedimentary rocks to the west. An end moraine at the northern outlet of the lake helps dam its waters.

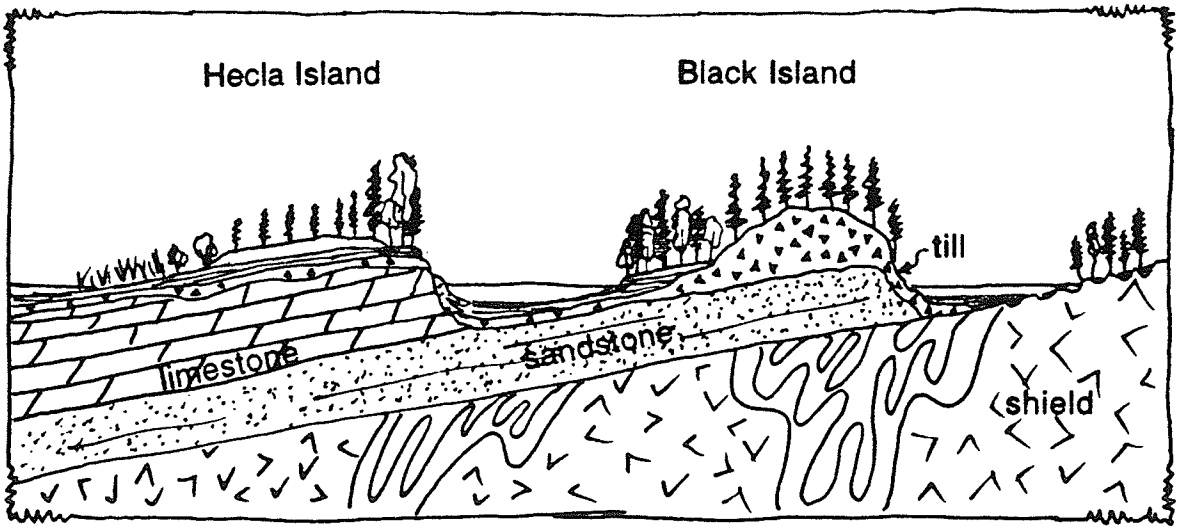


Figure 3: Physiography and vegetation, cross section of Hecla and Black Islands (Source synthesized from information in Goulet 1992 and surficial and bedrock geology maps).

Vegetation[2]

Hecla Island is located in the southern fringe of the great boreal forests of North America that sweep from Alaska to Newfoundland. A Manitoba classification of plant communities places Hecla Island in the Mixed Deciduous-Coniferous Forest zone, characterized by white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), trembling aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and the shrubs mountain maple (*Acer spicatum*), and common juniper (*Juniperus communis*) (Shay 1984). The deciduous forests found along the rivers of southern Manitoba also spread their influence to Hecla Island. Stands of green ash (*Fraxinus pennsylvanica*) are fairly common and Manitoba maple (*Acer negundo*), American elm (*Ulmus americana*), and bur oak (*Quercus macrocarpa*) are also found on the island. The poorly drained nature of many of the soils favours moisture tolerant trees such as black spruce (*Picea mariana*) and tamarack (*Larix laricina*). The Mixed Deciduous-Coniferous Forest when examined on a larger scale is found to be a mosaic of mixed and segregated forest stands, with extensive wetland areas added to the mix. The study area had deciduous and mixed forest stands along the shore, grading back to poorly drained, predominantly coniferous stands inland.

Deciduous forest stands are usually dominated by trembling aspen, a pioneering species often found in former burned or logged areas. Stands of paper birch and green ash also occur. The most common understorey shrub in the deciduous forest is hazel (*Corylus cornuta*). Deciduous stands occupy approximately 20% of the island.[3]

Mixed forest stands combine associations of black spruce, tamarack and balsam fir with deciduous trees such as trembling aspen, balsam poplar (*Populus balsamifera*), and paper birch. Better drained areas see a shift to white spruce with trembling aspen. Mixed forests cover about 16% of the island.

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[2] Information on vegetation from: Canada Land Inventory 1973, Goulet 1992, Shay 1984, personal communication with park interpreter, and personal observation.
[3] All information on forest cover is adapted from Goulet 1992.

Coniferous forest stands cover the largest area of the island at approximately 26%. Black spruce is usually dominant with tamarack and balsam fir as secondary components. White spruce grows in better drained areas.

Black spruce also dominates in muskeg areas growing on organic soils. Treed muskeg covers about 11.5% of the island. Open muskeg areas are found adjacent to treed muskeg in inland areas of the island.

As the western shore of the island is approached, wetlands grade from willow (*Salix* spp.) / alder (*Alnus* spp.) fens to marshes dominated by cattails (*Typha latifolia*), reeds (*Phragmites communis*), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.) and reed grass (*Calamagrostis* spp.). (Shay 1984, Goulet 1992)

The natural vegetation of the island provided many resources for the settlers. Forests provided logs for the sawmill and logging cleared land for pasture. Cordwood kept houses warm in winter. The marshes on the west side of the island provided hay for forage. Berries provided a welcome change in diet. Other plants were used as medicinal herbs, as dyeing agents, and as ornamental plants.

Soils[4]

Soils are formed by dynamic processes involving soil parent materials, water, climate, vegetation, soil organisms and their interaction through time. On Hecla Island, these processes have combined to produce soils, that for the most part, are marginal for agricultural operations.

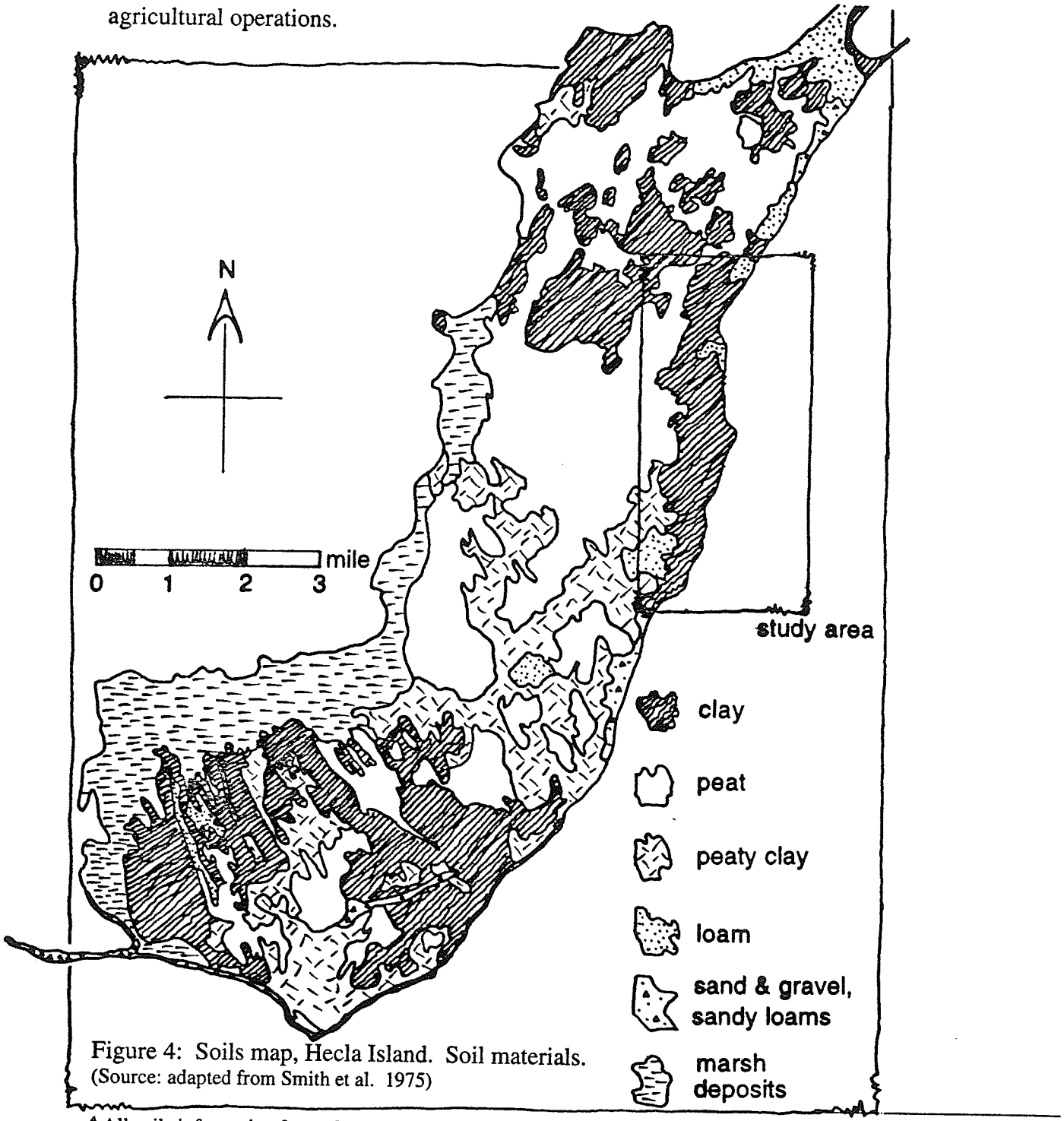

Figure 4: Soils map, Hecla Island. Soil materials.
(Source: adapted from Smith et al. 1975)

[4] All soils information from: Canada Land Inventory 1973, Smith et al. 1975.

Parent Materials

The main surficial deposits on Hecla are lacustrine clay and calcareous till. Over most of island calcareous till is veneered by lacustrine clay. In areas of level to depressional topography the poorly drained clay is often covered with peat. The best soils on the island occur where sufficient relief exists for imperfect to good drainage on lacustrine clays. The strongly calcareous till is found primarily in upland sites and tends to be quite stony. This restricts its suitability for agriculture. Ancient and modern beach deposits have left small areas of sand and gravel deposits primarily along the shore.

Climate

The cool subhumid climate of Hecla retards soil forming processes and the soils tend to be thin and undeveloped as a consequence.

Vegetation

Hecla is covered by mixed deciduous and coniferous forests and extensive wetlands. Leaching is the predominant process in the forests. Litter from coniferous trees produces organic matter that is more acidic and lower in nutrients than deciduous trees and soil underlying coniferous forests is therefore less fertile. Wetlands formed in poorly drained areas inland are usually infertile bogs which accumulate significant amounts of sphagnum peat. The marshes on the west shore of the island receive more moisture from runoff and lake flooding and are more fertile with expanses of marsh grasses, sedges and reeds. There is less accumulation of organic matter on the surface of these soils.

Time

The soils of Hecla Island are have had only a very limited time to develop. Soil formation was initiated with the post glacial retreat of Lake Agassiz. During the post-glacial temperature peak approximately 7 000 to 5 000 years BP, prairie parklands extended north to include Hecla Island. Chernozemic soil features produced under a grassland are still evident in a degraded form. During the last 3500 years climate and vegetation has been similar to the present.

Agricultural Capability-Soils

In a regional context, Hecla Island is on the boundary between an area dominated by dark-gray chernozems and brunisols to the southwest and an area dominated by luvisols and brunisols in the north and east. Gleysols and organic soils occur in both areas. The chernozemic dark-gray soils are the most fertile in the region with a dark surface horizon high in organic matter. They are rated class 3 for agriculture. Luvisols found on the island are also rated class 3 for agriculture. Luvisols developed on lacustrine silts and clays and are limited for agriculture by wetness and soil structure. Brunisols are developed on calcareous till and are limited by coarse texture, stoniness and low fertility. Gleysols are developed on soils that are saturated with moisture for at least part of the year. Gleysols are not suitable for agriculture unless they are drained. Organic soils cover a major portion of the island and need a significant investment in drainage and preparation before they can be used for agriculture. (Canada Land Inventory 1973; Smith et al. 1975)

The former agricultural area within the study area on the east shore of the island almost exactly matches an area that is 80% class 3 with a limitation due to soil structure and 20% class 5 with the main limitation due to wetness.[5] There are no other patches of land suitable for agriculture of equivalent size on the island. Altogether only 15% or less of the island is suitable for agriculture in an unmodified condition. The main limitation to agriculture throughout the island is excessive wetness, with large areas classified as 5, 6 or 7 due to wetness. There are also large areas of organic soils.

In the absence of massive investment in drainage and land clearance, as has occurred at Washow Bay, a district with similar characteristics 15 km to the west of the island, Hecla Island is inherently marginal for agriculture. This is especially the case when isolation from markets prior to road access via the causeway is taken into account.

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[5] The Canada Land Inventory rates suitability for agriculture in seven classes. Class 1, with no limits for agriculture, is not found in the region due to climatic constraints. Classes 2 and 3 are suitable for agriculture with some restrictions. Classes 4 to 6 are suitable for forage production. Class 7 is unsuitable for any agricultural purpose.

Climate[6]

The region has a cool continental subhumid climate influenced by isolation from oceanic influences and high middle latitude. The summers are short and warm and the winters are long and cold. Most rain falls in the summer months when convective rainfall increases. However, no season is without precipitation as the storm track of low pressure systems affects the region at all times of the year.

The January mean temperature is approximately -19 to -20°C while the July mean temperature is approximately 19°C. A total annual precipitation of 550 mm, includes 415 mm of rain and 135 mm moisture equivalent from snowfall (Canadian Climate Normals 1993).

Lake Winnipeg has a local moderating effect that is felt most strongly in spring and fall. During winter the lake freezes over and any moderating effect is very minor. The lake lags several weeks behind land in spring warm-up and cool breezes retard the advance of spring near the lake. By the middle of summer the lake has warmed considerably and moderates nightly temperatures. In autumn the land cools significantly faster than the lake and its moderating effect extends the frost free season. Arctic air masses crossing the lake in late fall can pick up moisture and become unstable resulting in lake effect snow squalls with locally heavy accumulation.

Agricultural suitability - climate

All the climatic statistics for agriculture for Hecla are within the bounds found for agricultural areas of the eastern prairies. Hecla's cool summers do limit the cultivation of some agricultural crops. However, major prairie crops such as spring wheat, barley and canola will grow well in this climate. Production of forage crops and pasturage is well suited to the climate. Expansion of the Washow Bay agricultural region 15 km west of the island indicates that the agricultural frontier in the region is limited by lack of suitable soils, not by climate.

[6] Information on climate from: Ash et al. 1992, Canada Land Inventory 1973, Canadian Climate Normals 1993.

Table 1: Climatic statistics compared to agricultural regions of the eastern Canadian Prairies

Average Date of Occurrence of Last Spring Frost at 0°C	May 30	ave.
Average Date of Occurrence of First Fall Frost at 0°C	Sept. 12	late
Average Length of Frost Free Period Above 0°C	110 days	>ave.
Average Accumulated Number of GDD[7] above 5°C	1500	< ave.
Average Accumulated Number of GDD above 10°C	875	low

Source: Ash, et al. 1992 Agricultural Climate of the Eastern Canadian Prairies.

Fauna[8]

Hecla Island has a rich and diverse fauna and the waters of Lake Winnipeg and the marshes harbour many more species. Among the vertebrates the most diverse group is the birds, with many species occupying the island and others using the island as a resting stop during migration. Fish, mammals, amphibians and reptiles are also represented in the island's fauna (in descending order of number of species).

BIRDS are the most visible members of Hecla's wildlife. Diverse habitats of wetlands, shorelines, open water, coniferous forests, deciduous forests and meadows support a corresponding diversity of birds. The Hecla marshes support breeding populations of many ducks, Canada geese, grebes and other marsh birds. The marshes are also an important migrant staging area. Hecla's mixed forests support birds characteristic of both the aspen forests to the south-west and of the boreal coniferous forest on the east side of the lake. The waters of Lake Winnipeg and Hecla's long shoreline support many bird species, including sandpipers and plovers, fish-eating raptors such as osprey and bald eagle, gulls, terns, cormorants, pelicans and herons.

[7] Growing Degree Days, a measure of accumulated warmth above a set temperature during the growing season.

[8] Information on fauna from: Goulet 1992, Heuring 1993, Remnant 1991, personal communication with Hecla residents.

Birds taken for human consumption include ducks, geese, and grouse. The Icelandic tradition of egg-gathering from colonial nesting birds may have continued as well. This activity is still undertaken as part of traditional aboriginal food gathering.

MAMMALS found on the island are typical of the boreal coniferous and mixed woods biomes. The most spectacular member of the mammalian fauna is the moose (*Alces alces*), an unofficial symbol of the park. Other large fauna include the black bear (*Ursus americanus*), the timber wolf (*Canis lupus*), and the white-tailed deer (*Odocoileus virginianus*). All these large mammals were hunted in the past. The moose and deer were probably important food sources at times in the past. Trapping of furbearing mammals was also important to at least some individuals. Among the species taken were muskrats (*Ondatra zibethicus*), beaver (*Castor canadensis*), lynx (*Lynx lynx*), red fox (*Vulpes vulpes*), mink (*Mustela vison*) and weasel (*M. erminea*). Rabbits, hares and squirrels were also hunted and trapped for fur and food.

REPTILES and AMPHIBIANS are not common in Manitoba's extreme climate. However, a few hardy species range well to the north. Western painted turtles and garter snakes are fairly common on the island. Frogs and toads are abundant and include several species at the extreme margin of their range.

FISH and fishing were one of the main bases of settlement on Hecla Island. The waters of Lake Winnipeg yielded an abundance of fish for home consumption and the market. Common names for fish, referred to in this section and throughout, will follow the names used on Hecla Island which corresponds to usage by Lake Winnipeg commercial fishers. Lake Winnipeg supports forty-eight native species and four introduced species of fish. The three main commercial species are whitefish (*Coregonus clupeaformis*), pickerel (*Stizostedion vitreum*), more usually known as walleye in the rest of North America, and its smaller relative the sauger (*Stizostedion canadense*).

Whitefish was the first species to dominate the commercial fish harvest. This fish is still taken in large numbers from the north basin of the lake but is not commonly caught

in commercial quantities in the vicinity of Hecla Island. The most important fish in the present commercial catch in the waters around Hecla are sauger and pickerel. These closely related fish are prized by both commercial and recreational fishers for their firm white flesh and delicate taste.

Other fish are also important in the lake. The various minnow species occupy the base of the food chain. Tulibee (*Coregonus artedii*), also known as lake cisco and lake herring, is a plankton feeder which was an important commercial species in the past but is no longer sought due to lack of markets. Jackfish (*Esox lucius*), also known as northern pike, is a minor commercial species. Lake sturgeon (*Acipenser fulvescens*) was important in the early commercial fishery but its numbers are now very much reduced. Maria (*Lota lota*), also known as burbot, is a member of the cod family that has traditionally been rejected by the industry and local inhabitants due to its scaleless slimy skin. The various bottom feeders, such as the suckers (*Catostomus & Maxostomus* spp.), the introduced carp (*Cyprinus carpio*), and the sunfish, or freshwater drum (*Aplodinotus grunniens*) are abundant but considered to be coarse fish and enter the market only irregularly, except on a local level.

2.3 Historical land-use patterns

The main pillars on which settlement of the island was based were pastoral farming and fishing. Captain Helgi Jones of Birkiland recognizes this implicitly when he writes, "As I grew up on Hecla fishing was the way of life. The land that was not covered with heavy timber was very stony and not suited for agricultural purposes even though most, if not all of the homes had cattle and sheep along with a garden, therefore food was always plentiful ... The fish sold brought in a few dollars which bought the necessities" (McKillop 1979, p.55). Other natural resources were also exploited, either on a subsistence basis or for the market. The most important was logging. Others included woodcutting for fuel, trapping of fur-bearing mammals, hunting of birds and game, and gathering of fruits, berries, medicinal herbs, dye plants, and ornamental plants. Cultural patterns of resource use are a blend of those inherited from Iceland, those learned from other groups on the lake and prairies and innovations evolved on the island.

2.3: i Farming

Hecla Island is marginal for prairie grain crops and remote from markets. The agricultural system developed by the Icelandic settlers on the island was a distinctive mix dependent on stock raising. Horses,

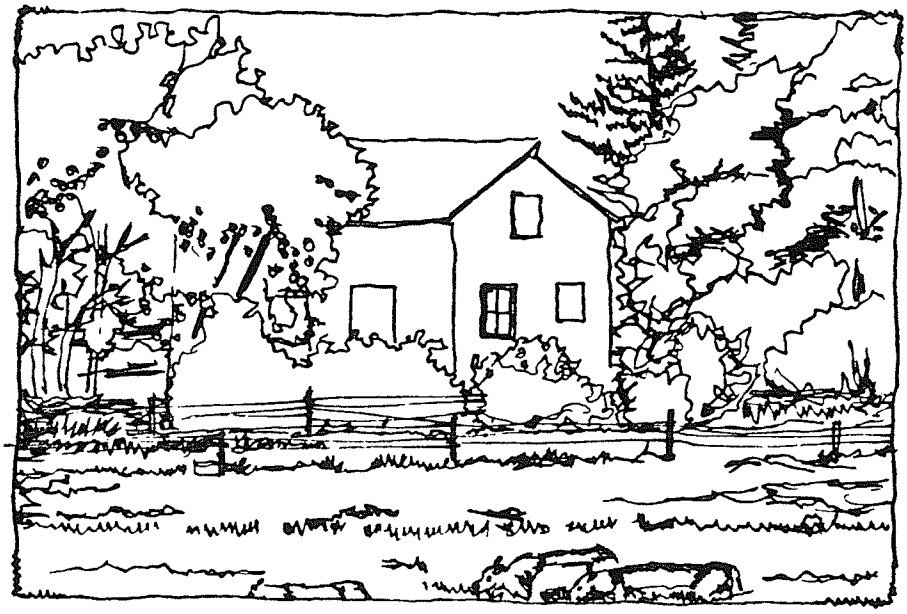


Figure 4: Typical farm scene of beef cattle grazing in a pasture with barn in the background.

sheep, beef and milk cattle all had their place. Horses were used for draft purposes on the farm and on the lake and forests for winter freighting. Sheep were necessary for wool processed on the island into clothing. Beef was produced for home consumption and for market. Dairy products were significant for subsistence and could be sold for extra income. Fodder production for livestock was therefore the main objective of farming. Home field pastures and hay meadows were important, as was wild hay from the marshes on the western shore.

Hay

The hay harvest was one of the most important events in the year and a great deal of labour was invested in it. In the early years, all mowing, raking, drying and stacking was done by hand. It took the larger part of the summer to gather the hay crop using this labour intensive process . Emalía Íngólfsdóttir Williams (McKillop 1979, p.42-45) describes haying as follows. "Towards the end of June the grass was ready to cut for winter hay." The Father and eldest son "did all cutting by hand and scythe. ... The following day in the forenoon mother and children turned the hay to dry the underside, in the afternoon we would rake it all together and pile it into high cone-shaped piles, these were later carried together to make haystacks by putting long poles under them."

In contrast with other groups such as the Wisconsin dairy farmers who stored their hay in large storage barns, most hay in Hecla was stored outdoors in haystacks. The compacted hay had a rounded form and shed water like a thatched roof. Haystacks were a conspicuous part of the cultural landscape.

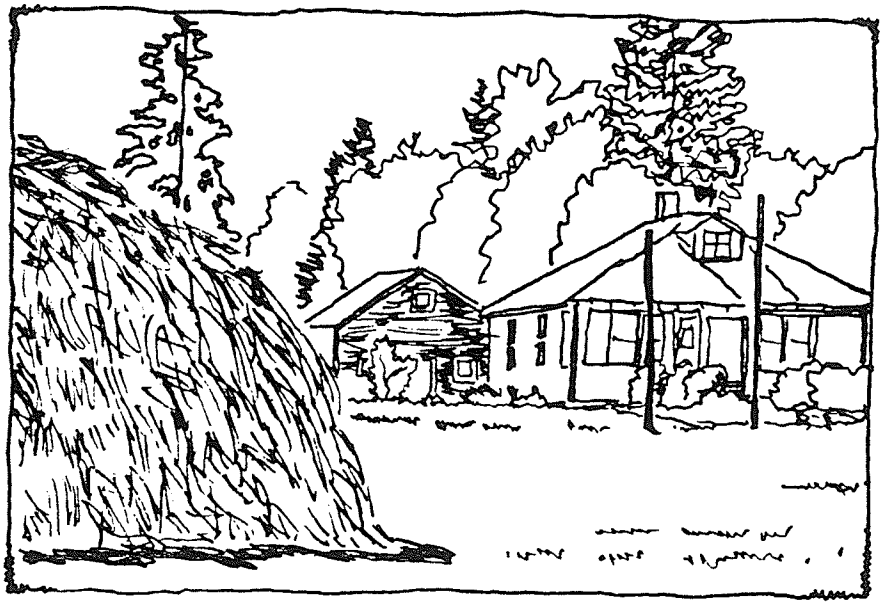


Figure 5: Haystack near farm house.

The introduction of horse drawn mowers and rakes made the haying process quicker and more efficient. At the same time, the widespread adoption of horses for draft purposes increased the demand for hay.

The hay marshes or meadows, on the west side of the island were vital to the settlement of the Island. Clearing of the heavy forest on the east side of the island to create hay fields was impractical for the early pioneers with their limited resources. Some of the early homesteads on the island were located on the low western shore in order to take advantage of the nearby wild hay. However, flooding from high water on the lake soon forced them out. The early settlers located on the higher east side had to cross the island for their winter hay. Sigurdur Erlendsson of Skógum, a pioneer in the 1870s (McKillop 1979, p. 24), states that "We had to walk six miles to the hay meadow to make hay for the cow and ox." As land was cleared on the east side it could support more animals, which in return required more hay, which the marsh hay could provide. The marshes did not have to be cleared or fertilized with manure to yield an abundant harvest.

The marsh hay meadows were still very important in the 1930's to the Hecla Lumber Company, Reynivellir, whose logging camps depended on horse power to skid logs and pull freight on team sleighs. It was therefore one of the biggest users of hay on the island. Each August, the company had a gang of men haying on the west side of the island (McKillop 1979, p. 97). The tracks across the island, used by the islanders to

reach the hay lands were rough and usually had to pass through muskeg and other soft spots on the way. However, in winter loaded team sleighs could easily pass over packed snow trails bringing the hay harvest to the farms on the east side of the island.

Horses

Before the widespread adoption of tractors and other motorized vehicles after World War Two, horses supplied the main motive power for transportation. Horses were used on the farm, on the lake in winter, and in the forest. Teams of horses were kept on all farms, trained as draft animals or as carriage horses drawing buggies or passenger sleighs.

Sheep

Sheep were important in Icelandic culture as a source of wool and meat. Most islanders kept sheep for their home use. The sheep were sheared in May and their wool prepared for use. It had to be washed, dried, carded, spun, dyed and knitted to produce a finished garment. Emalía Íngólfsdóttir Williams remembers helping her mother, "card the wool, some of which was used for comforters, the rest spun into yarn then knitted into mitts, socks, leggings, sweaters, skirts, skarves and toques.." (McKillop 1979, p. 45) Wool was used as a stuffing for quilts. Sheep skins were scraped, cleaned and dried to produce skins used for footwear.

Hangikjöt, smoked mutton, was a favourite food. Rullapylsa, a spiced sausage rolled from the flanks of lamb, was also typical of the Icelandic cuisine on Hecla Island. The rest of the animal was used in a variety of ways.

Milk Cows

Milk and dairy products were very important food products on the island. An early pioneer on the island counted the acquisition of a cow as an important asset in improving his family's circumstances (McKillop 1979, p. 24). Milk, butter, skyr and whey all formed important parts of the diet. Skyr is an Icelandic soft cheese, similar to yogourt, that was eaten as an every day staple. For breakfast and desert it was eaten with a little

sugar and milk. The whey left from making skyr was an important preserving agent and was also used as a beverage. Emalía Íngólfsdóttir Williams (McKillop 1979, p. 42-45), discusses the use of whey to preserve meat at the end of winter when the frost would no longer keep it frozen. "Through the winter the whey had been saved from the skyr. This was kept in a stone crock in a warm place that it might sour. When the head cheese and legs were prepared they were placed into the soured whey, two weeks later we had delicious pickled meat." When haying on the west side in August, the lake water was undrinkable because of the green scum from algae blooms. Soured whey provided an adequate replacement in the diet of the men working in the hay fields. "For many months before haying time the women would save the whey from the skyr, pour it into a stone crock, store this in a warm place to sour. ... Holes were dug in the centre of a clump of willow bushes, the food and drink placed into these holes." (McKillop 1979, p. 97)

Every farm had milk cows to provide its own daily needs. As well a few farms specialized in dairy production. Milk cows received better feed and shelter than other animals. The extra effort involved was more than worth the trouble because of the importance of dairy foods in the diet.

Beef Cattle

Several farmers specialized in beef cattle once access to the market improved with the opening of the ferry service to the mainland. One farmer had three hundred head of beef cattle in 1962 (McKillop 1979, p. 120). During the subsistence era farms were likely to raise a non-specialised breed of cattle, producing both meat and milk. Beef breeds such as Hereford are more efficient in larger commercial herds.

2.3: ii Fishing

The men of Hecla Island took part in fishing in both local waters and on fishing grounds on northern Lake Winnipeg. The early summer and fall seasons are open water fisheries and an active winter fishery occurs through the stable ice cover. Local fisheries with their decentralized operation had a different effect on the cultural landscape than

distant fisheries that took labour away from the island. Similarly open water and winter fisheries had different impacts on Hecla Island.

Distant fisheries took a significant portion of the male workforce of the island away for a period as long as four or five months (early June to October). The summer season was also the season of greatest demand for labour on farms as it corresponded with the hay harvest. Fisheries in the north basin of the lake also had a positive effect on the island as lake steamers carrying freight and fish to and from the north end of the lake followed a shipping route just off the east shore of the island, making it convenient to land. Access to Selkirk and Winnipeg was assured to the settlement.

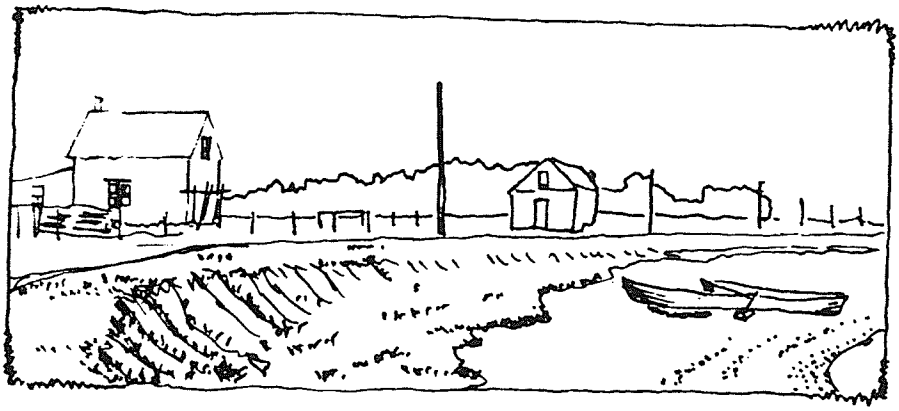


Figure 6: Fishing boats drawn up on the beach at Skjaldartröð

Local fisheries could take place just offshore of the farmhouse if there was a landing place on the beach. The subsistence fishery this encouraged was valuable in the early days of settlement. Greater capital investment was needed to pack fish commercially in the village. This concentration required the catch of many fishermen from throughout the island. An early fish packing plant, operated by the Sigurgeirssons of Reynivellir illustrates the influence this had on the establishment of the village in conjunction with the saw mill. Barns for horses, a dock to tie up ships and a freezing plant (that relied on ice harvested from the lake) were built (McKillop 1979, p. 92). Fish packing remained in the village until the one year closure of the Lake Winnipeg fishery in the early 1970's. The present fish shed on the government wharf is a reminder of this important activity.

The waters off Hecla Island are presently fished in all fishing seasons. Fish are packed at the fish packing shed in Riverton or on a fisherman's own premises. All fish for commercial sale caught in Lake Winnipeg, and indeed in the whole province, are shipped to the Freshwater Fish Marketing Corporation plant in Winnipeg.

Fish For Home Consumption

Fish for the market were packed frozen or fresh on ice, but fish for home consumption were preserved in many ways. A popular method to preserve fish was to make Harðfiskur, prepared as follows: "a large number of Pickerel were washed, cleaned then strung on long poles that were hung out in the open air until the flesh was white and dry. It was then pounded with a hammer and served with butter."(McKillop 1979, p. 77) This fish is still considered a treat by many of Icelandic descent. Fish were also salted, smoked, and canned, as well as frozen during winter. The preferred fish for smoking were goldeyes and catfish. Whitefish and sunfish were also smoked. Canning was not part of the original fish preserving techniques brought from Iceland, and was assimilated later. Canning was used primarily for suckers and other rough fish.

Winter fishing

Winter fishing presented novel demands and opportunities for the fishermen and fishing industry. The frozen surface of the lake was an opportunity to use animal power to assist in transportation. Dog sleds were used on early thin ice and for quick trips to and from the fishing camps. Dog teams were fed from rough fish that could not be sold on the market, including tulibee and maria. Horses provided heavy transport, pulling team sleighs loaded with freight of fish boxes. Lake Winnipeg was a highway for 'trains' of freight sleighs hauling fish and other freight to the railhead. Stopping places, where travellers on the lake stayed, served this traffic. Demand for feed for horse teams brought hay and oats into the commercial market.

One fishermen relates that, "it was a big occasion when we retired the dogs and horses in 1950 when we bought our first Bombardier."(McKillop 1979, p. 57) The

period immediately before and after the war saw a big change in the winter landscape of the lake. The Caterpillar™ tractor took the place of the horse in freight hauling. A road was extended north along the west side of the lake to Pine Dock at the north end of the narrows—diverting freight traffic from the north basin away from lake ice and Hecla. The Bombardier was a significant advance in the winter fishery. This enclosed tracked vehicle ventured anywhere over the frozen surface of the lake once the ice reached a sufficient thickness for safety, generally twenty centimetres (eight inches). The extended range available to fishermen using a Bombardier enabled winter fishing to take place from the home, instead of from a fish camp set up for extended stay near the fishing grounds.

This account of winter fish camps in the 1930's gives a good idea of the conditions encountered in the search for the best fishing locations. "For (winter) we went away from home and lived in what we called 'Camp.' The 'Camp' was a small winterized hut, this was transported along with ourselves, a good team of the best Husky dogs, necessary food and equipment. We used kerosene lamps and lanterns. The food packed into a fish box consisted of tea, sugar, flour, rice, beans, coffee and some salt pork. Our meat we hunted from the forest nearby. ... All this was transported in the late fall on the small pick-up boats. They usually took two outfits on each trip. To locate we would choose a sheltered area where there was the least danger that the ice might sink from underneath us. Now we could set our nets immediately following freeze-up for that was the time the catch was most abundant. The huskies would haul the catch and when the ice got stronger we could visit our homes on Hecla with the aid of our willing helpers." (McKillop 1979, p. 77)

These isolated locales along the lake shore were linked to a freight system on the lake set up by the fish companies. Fish was collected, freighted to a railhead and shipped to market in the United States.

Organization of the Fishing Industry

A similar system was set up on the lake by fish packing and freighting companies for the open water fishery. Stations were set up on islands and points with good harbours that could accommodate ships used to carry fish to the railhead at Selkirk, Gimli, or Riverton, and that were near to good fishing grounds. During the 1937 season the following stations were in operation: Warren's Landing, Big George's Island, McCreary Island, Big Black River, Poplar Point, Little George's Island, Shoal Point, Sandy Island, Spider Island, and Berens River (Grant 1938, p. 8). South of the whitefish grounds, smaller stations or fishing camps were scattered along the shores through the narrows down to Black and Deer Islands. From Hecla southward, settlers fished from their homes (Grant 1938, p. 9).

Freighting on Lake Winnipeg was first handled by steamers, which were later replaced by smaller diesel engine boats. Diesel powered boats were cheaper to acquire and operate, so local packing companies and independent freighters with less capital were able to enter the market once dominated by large American controlled fish companies (Grant 1938, p.9).

Ninety percent of the fish from Manitoba's freshwater fisheries were exported to the United States (Grant 1938). Contacts in the markets of big American cities, such as Chicago and New York, helped American companies to control the export of Manitoba fish.

Most fishermen were dependent on fish companies or packers for financing of their operation and were not in a good position to bargain for better prices. During the 1950's prices were kept low in the fishing industry and job prospects in the post-war boom economy increased (Heuring 1993). It was at this time that many fishermen began to leave the fishery, and Hecla Island, to search for better prospects elsewhere.

Fishing Equipment

The earliest boats used in the fishery were open rowboats and sailboats. Nets were handmade from linen or cotton twine. Lake steamers towed sailboats to the fishing grounds and transported the product to market. With the introduction of diesel powered engines, smaller boats could be mechanized. Whitefish boats are still known as 'gas boats' to a few in the older generation. Finally, the introduction of outboard motors in the late 1930's brought internal combustion power to the smallest boats—skiffs. An important innovation of the postwar era has been the factory made synthetic fibre net. Natural fibre nets had "to be dried and cured every week while ... fishing"(McKillop 1979, p. 58). The nets were spread on reels—rotating open frameworks of wood.

An important innovation in the winter fishery was the invention of the jigger around the turn of the century. This device floats along the bottom surface of the ice. A rope, known as the running line, trails behind to the operator standing at a hole in the ice. Pulling the running line engages a lever that uses the ice as a fulcrum, sending the jigger forward. When the jigger reaches a predetermined distance, the jigger is located by sight, or by sound as it knocks the bottom of the ice. A hole is chopped or augered through the ice to retrieve the running line. The running line can then be used to pull a net under the ice to be suspended between the two holes. A whole series of nets is set in this fashion, forming a 'gang' of nets. This method is much faster and more efficient than the previous one involving long poles. It also allows nets to be set through much thicker ice.

The backbone of the open-water fishery has always been the open skiff used for gill netting. These small boats are manned by one to three people who haul the net across the bow of the boat, picking the fish from the net as it passes.

Larger in size is the Whitefish boat, used for extended journeys to the north basin during the summer whitefish season. An enclosed cabin provides room for crew and galley. Grant (1938, p. 18-19) describes the use of these boats in the north basin fishery during the 1930's, as follows: "In summer and fall the boats pull out from camps about

daybreak, each boat carrying a crew of four men ... The size of the fishing boats ... is from 32 to 36 feet in length. ... When the boat reaches the locality selected for that day's setting, the end buoy is thrown overboard and after that the anchor stone. ... On the upper end of the buoy is a canvas flag on which is printed the license number under which the nets are being fished. The nets are 'payed' out over the side of the boat while the engine is running at slow speed. ... The nets are lifted daily when weather permits. As the nets are pulled into the boat the fish are taken out and put into what is known as the 'fish pocket' amidship. This pocket is from 5 to 6 feet long and in breadth, the entire width of the boat. ... the bottom is covered with a layer of crushed ice and during the process of lifting, ice is continually added so that ... the fish are kept smothered in ice from the time they are taken from the net until they are landed at the station, which may be for a period as long as eight hours.

Fishing Regulations

The regulatory framework under which fishermen operated significantly affected participation in the fishery. The restriction of the summer whitefish fishery to the north basin kept the opportunity cost to enter the fishery high, restricting entry to the more prosperous fishermen. The winter fishery had lower opportunity costs; it was closer, fishermen could set up their own camps, and fishermen did not have to own or rent the expensive whitefish boats.

2.3: iii Other natural resources

Logging

Logging began on Hecla Island before the Icelandic immigrants arrived. Logging started in the early 1870s with the establishment of a sawmill on the island, which was then known as Big Island. The expectation of work at the sawmill was an important factor in locational decision-making of the early pioneers. Commercial logging was not continuous on the island. The original sawmill did not operate for long and the islanders'

own sawmill eventually exhausted the supply of large logs. While they operated, the mills provided a source of income and acted as a centralizing factor in the village. Logging also left behind cut over areas in the forest, with farms subsequently occupying some of this land.

The sawmill at Reynivellir in Hecla village, was purchased in 1913. It operated as the Hecla Lumber Company in the 1920's and 1930's. The mill was in production through each summer with forest operations during the winter months. "It was made up of two large boilers heated with slab edgings and saw dust. A large saw, edger and planer. Men and horses skidded each log to the carriage, the outside was sawed away, the log was then sliced into boards, each board was then edged and planed. The lumber was placed on carriers and transferred to the lumber yard where it was piled in a manner that air could seep through, drying time took two months."(McKillop 1979, p. 93) The workmen of the mill were called to work with the mill's whistle. The prospect of steady work at the sawmill and other enterprises in the village induced families to locate in houses in the village, instead of living autonomously on a farm.

Winter operations took place in the forests of the island. "At the peak of the mill's operation (it was) leasing seventeen quarters of forest land on the Island"(McKillop 1979, p. 93). The logging camp was a busy place employing men and horses during a time of the year when there was less work on the farm. "The winter logging camp employed fifteen men and three teams of horses. The trees were felled, two men, one on each end of a buck saw, the branches chopped off and one horse used to skid them into a pile. They were then loaded unto (sic) double sleighs and pulled into the mill sight (sic). When sawing on land near the lake the logs were skidded into the lake, a large frame was made of logs and into this frame the rest of the logs were crammed together, the 'boombs,' (sic) as they were called, were then towed to the mill site " (McKillop 1979, p. 93)

The network of forest trails and camp sites used by the logging operations formed a significant part of the cultural landscape of the island. Some of these forest trails are still in use as recreational snowmobile trails.

Woodcutting

A winter's worth of fuel wood had to be collected and stored every year. In the cold climate of Hecla this was a major undertaking. Wood was cut in early spring when sufficient snow remained on the ground to make use of horse drawn sleighs. After splitting and piling, the wood had all summer and fall to season.

As well as heating the house, wood was used in the kitchen wood stove on which so many chores were done—cooking, baking, heating water for washing, heating irons for laundry, etc. Many families also had a second wood stove outside the main house in a building called a summer kitchen. The heat produced by a wood stove is considerable and the summer kitchen, unlike the main kitchen, did not heat the living areas of the house. In the summer kitchen, "the stove was kept burning, all cooking took place in it as well as heating of the irons on wash day. This kept the main house cool and fresh through the summer months"(McKillop 1979, p. 239). The summer kitchen was not often found in areas settled by British Canadians. In the United States the summer kitchen is associated with areas of German settlement (Conzen 1990a, p.229).

Furs

Fur bearing mammals were reasonably abundant on Hecla Island and supported a small trapping industry. The most abundant fur bearer was the muskrat, found in large numbers in the western marshes. In high population years, the marsh appeared dotted with miniature hay stacks—the winter lodges of these semi-aquatic rodents.

Related to trapping is the farming of animals such as fox or mink for fur. Jón Kjartanson of Brekka, raised minks on his farm from 1930 into the late 1960's. The minks were fed on fish and grown for their pelts.

Hunting

Although hunting was not important economically it had important functions in the community. The social aspects of the camaraderie of the hunt are always important wherever hunting is engaged in. The provision of meat for subsistence was also important, as was related with regard to winter fishing camps.

Gathering

Wild plants supplied variety to diet and also were used around the household as dyeing agents, ornamentals, medicines and perfumes.

Some of the most important wild plants were edible berries. Three berries can be picked in significant quantities in the environment around Hecla Island. Saskatoon berries (*Amelanchier alnifolia*), are borne by tall shrubs and were used in pies and jams. Blueberries (*Vaccinium* spp.) are found in pine woods on the sandy soils on nearby Black and Deer Islands. Expeditions to pick blueberries went out to these islands in early August. Raspberries (*Rubus idaeus*), although found on Hecla Island, were also the subject of berry picking expeditions in July and August. These were festive occasions, "Raspberry picking time was such a pleasure. Dad would take the boat and all of us on just the nicest day in July across to Black Island"(McKillop 1979, p. 102). Other berries not as palatable to eat fresh were used in preparing jellies and preserves. Highbush cranberry (*Viburnum trilobum*) is a sour berry used to make jelly. Of the two wild cherries (*Prunus* spp.), the pin cherry is very sour and the chokecherry, while sweet is also astringent. Wild strawberries (*Fragaria* spp.) were found in some abundance in the hay meadows on the east side of the island.

The preparation of wool to make warm clothing benefited from the use of wild dye plants. A red berry was used in preparing red dye for yarn spun from wool (McKillop 1979, p. 45 & 73).

Herbal medicine is part of all folk traditions. The one herbal medicine mentioned in McKillop (1979, p. 42) is Vallhumall, an ointment made from Yarrow, a weedy herb

introduced to North America from Europe. Juniper berries were also used in a medicinal preparation.

Native plants were transplanted to houseyards as ornamentals and were also gathered from the wild to decorate the hall on festive occasions. For a Friday night summer dance, the hall would be decked with wild Marsh-Marigolds, Irises and Ferns (McKillop 1979, p. 187). Of the ornamental plants transplanted to the Islanders' gardens the most common was the mountain ash. This large shrub to small tree was valued for its form, compound leaves and clusters of bright orange-red berries that last from July to winter. Other plants commonly transplanted were ferns, and deciduous shade trees.

2.4 Historical evolution of the cultural landscape

Hecla settlement in the Frontier Context

Hecla was settled before the main pioneer wave that swept over the Prairies between 1896 and 1910. New Iceland was an early outlier of settlement in the northern forest fringe of the Prairies. Only after 1910, when the "best of the easily accessible land south of a line from Winnipeg to Edmonton was taken," did the general frontier push into this zone (Ironside 1974b). Hecla's problems during the 1950's and 1960's were typical of many frontier areas. Many areas were experiencing a population decline, low farm incomes and abandonment of farms and farmland. On Hecla Island agriculture was marginal in both physical and economic terms. Fishing had brought prosperity, but was declining. Legislation to counteract rural poverty in the marginal, frontier areas of the Prairies was passed in the 1960's (Ironside 1974b). It was in this context that the conversion of Hecla to a park was proposed. The Interlake area of Manitoba was one of the development regions studied by the Department of Regional Economic Expansion (DREE). Hecla was identified as a potential tourist area in the Interlake that could spark regional development. Government funding bought out the land owners, connected the island to the mainland with a causeway and developed a tourist infrastructure at the north end of the island. The cultural landscape entered a period of neglect and radically different maintenance regime.

2.4: i Evolution of the Cultural Landscape on Hecla Island

The historical processes that led to the evolution of the cultural landscape on Hecla Island following the first Icelandic settlement may usefully be analyzed using a quarter century framework. The first twentyfive years saw development from a pioneer situation to a stable community. Twentyfive years later, in 1926, population was similar and the community was about to enter its era of greatest prosperity and growth. The 1951 census revealed a population just slipping from its highest plateau, in a community that was

improving its links to the outside world. The following twentyfive years witnessed a collapse in population and a desperate attempt to introduce tourism to save the community. This strategy backfired and accelerated the breakdown of the community as property was expropriated to develop a provincial park.

1876-1901: This era saw the earliest pioneering efforts and the development of a self-sufficient community. The nucleus provided by the pre-existing sawmill encouraged settlement in the immediate neighbourhood. This mill is commemorated in the name of the farm at Mylnuvík. Homestead survey maps document changes from the 1880's through to the first decade of the twentieth century (Dominion Lands Office/ Department of the Interior 1889, 1913, 1916). Early attempts at settlement on the south west and northwest shores of the island met with failure during the years of flooding and high water on the lake. Settlement consolidated in a strip on the east shore, on farms a quarter mile (800 m) in width. A lakeside trail linked the farms almost from the beginning, but was not yet a formal road.

1901-1926: Demographic expansion of the settlement was limited by opening of new settlements in the great prewar pioneering rush on the Prairies and by the effects of the war. Greater involvement in the fishing industry and renewal of lumbering with the new sawmill caused a greater demand for horses as draft animals. In summer, horses provided the power for the mechanization of the hay harvest. In winter, fish freighting and lumbering depended on horses to pull freight sleighs. The expanded hay harvest led to greater exploitation of the west side hay marshes.

1926-1951: This era of growth saw increased concentration of population within the village as commercial and industrial opportunities increased the number of jobs available. Most of the substantial houses were built during this era, replacing earlier pioneer log dwellings and the initial small frame houses. Substitution of the internal combustion engine for animal draft power during this era led to the construction of a road network

and the effort to provide a link to the mainland, which was fulfilled two years later with the opening of ferry service.

1951-1976: Population decline determined the course of landscape evolution during this era. Decline in the fishing industry, combined with low wages relative to those in expanding portions of Canada's post-war boom economy, led young people to leave the island in search of better opportunities elsewhere. The decline in demand for draft animals, plus the loss of individual household demand for milk, led to a shift in the emphasis of the pastoral economy toward beef cattle. The ferry connection provided closer links to markets for beef cattle.

With the decline in population the islanders' began to see tourism as the last hope to provide a sustainable basis for their community. They knew that the limited capacity of the ferry and the long, gravel road used to reach it would discourage growth in tourist traffic. Therefore they turned to government for help. Tourism on Hecla Island fit in well with the goals of regional development for the Interlake, and federal funding was available for regional development, including tourist facilities.

1976-present: Since the centennial of Icelandic settlement in 1976, the status of the cultural landscape within the park has been problematical. The original vision of an 'Icelandic fishing village' has not been carried out and would not adequately represent the nature of the community. The cultural landscape was also seen as an encumbrance to development of the park. The expropriation process effectively dismantled the community to make way for ease of development. Houses and other buildings were auctioned off and removed from the island, thereby opening major gaps in the physical fabric of the settlement. A newspaper advertisement for an auction sale indicated twentythree houses were to be sold (Land Acquisition Branch 1975), fortunately a few of these still remain on the island.

2.4: ii The contemporary cultural landscape

The village has been partially restored and various buildings are used as museums and visitor interpretive centres. Only a fraction of the historic buildings on the island are well maintained, consisting mainly of inhabited houses, and restored buildings in the village. Neglected buildings that remain are weathered and on the verge of collapse. However some buildings have been stabilized as part of the restoration effort. The fields and meadows are subject to an irregular maintenance regime or are kept mowed in a wide roadside verge. In the absence of the processes that shaped the landscape the cultural landscape is changing and losing its connection to the people of the island, their way of life and how they used the land.

The cultural landscape within a provincial park

Hecla Island is located within Hecla Provincial Heritage Park. Land use and development are set by a management plan approved in 1988 for a ten year span (Hecla Management Plan 1988). A management plan reflects the unique aspects of a park while following the legislation establishing the provincial park system and the overall park system plan. Provincial parks in Manitoba allow for mixed use with provision of zones where certain activities are prohibited. Land may be set aside for intensive recreation and associated commercial development, or at the opposite extreme may be preserved as wilderness. Four zones have been established on Hecla Island. An Access Zone follows major thoroughfares. An Intensive Recreation Zone is located in the Gull Harbour area. The majority of the island is zoned for Extensive Recreation. This zone allows remote camping, hiking, viewing, photography, trail systems and interpretation. Traditional trapping and berry picking are permitted. Active habitat enhancement and wildlife viewing structures are used to increase enjoyment of wildlife.

The Cultural Heritage Zone encompasses most of the remnant of the cultural landscape. It is intended "to give visitors an insight into life in New Iceland." Interpretation programs that relate to "the life and culture of the settlement" including

fishing and traditional agriculture are considered appropriate. Developments are also considered appropriate where they respect the cultural heritage and architectural standards.

Section 3: Analysis

The cultural landscape will be analyzed using present and historic landscape features and patterns of use to determine the organization of the landscape and to determine the essential characteristics of process and pattern that define the cultural landscape. Among the resources available for analysis are homestead survey maps ranging from the late 1880's to the early 1910's, several sets of vertical air photos at various scales for the Postwar era, a modest selection of historic photographs, and numerous site visits.

Air photo analysis, using graphic, non-quantitative examination of visible patterns and changes, together with documentary and interview sources on historic land-use patterns are used to delimit the extent of the cultural landscape, describe the overall form of the cultural landscape and the form and function of units that are elements in the larger form. The forces that interacted to produce the characteristics of the cultural landscape as a result of the interaction between human cultural and landscape ecological systems are modelled to determine the processes that were essential in creating the cultural landscape. Visual and aesthetic typologies characteristic of the cultural landscape are abstracted. From the above analyses the essential characteristics necessary to maintaining and understanding the cultural landscape are extracted.

3.1 Delimitation of the cultural landscape

Theoretically there are no sharp boundaries on the continuous gradient from a landscape purely formed by human actions to a completely natural landscape. If we consider any landscape modified by human action, no matter how slight the influence, to be a cultural landscape, then virtually the entire island could be defined as such. However, there are obvious differences in the extent of human modification of the landscape from which three levels can be abstracted.

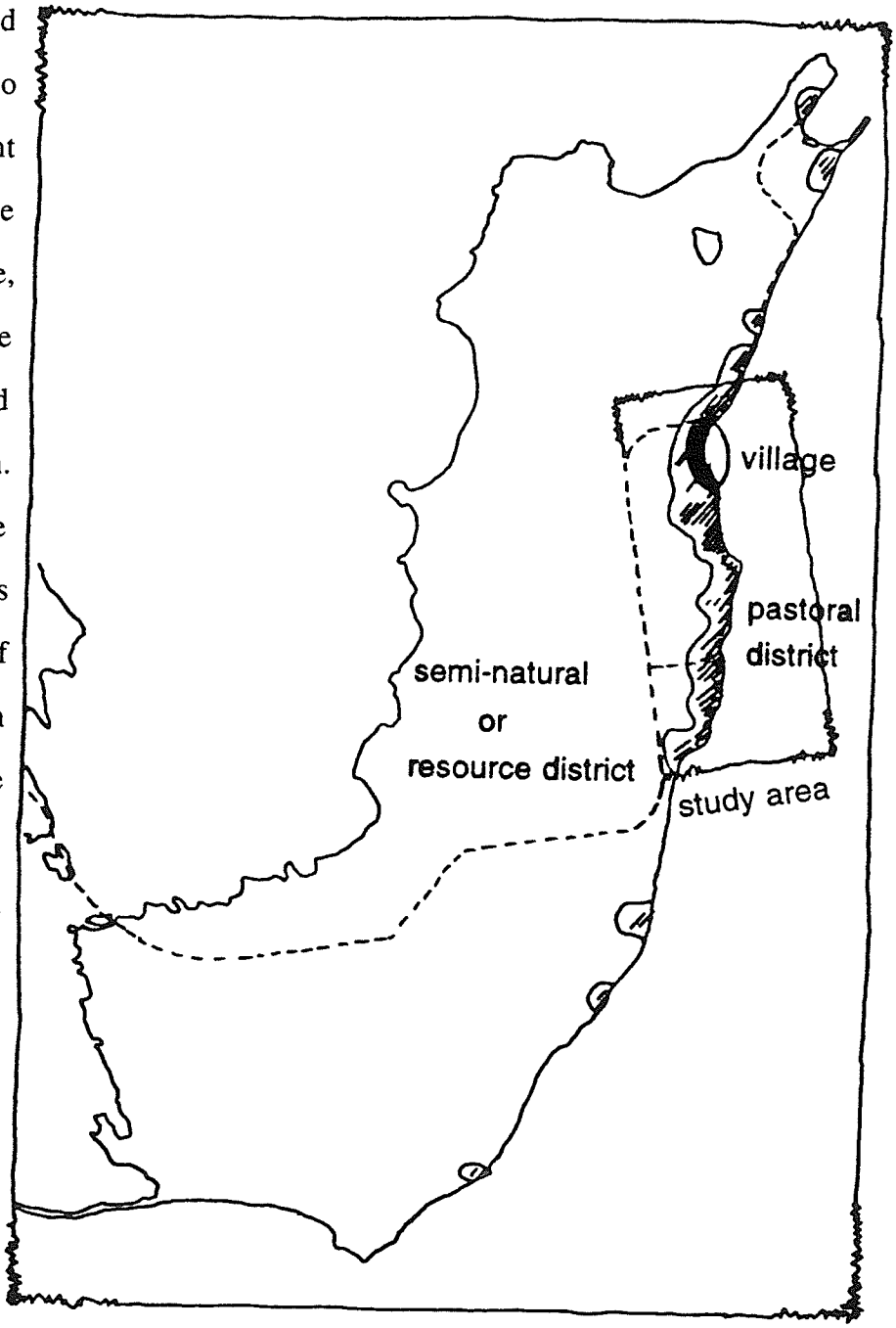


Figure 7: Delimitation of the cultural landscape: **i.** village or core, **ii.** pastoral district, and **iii.** seminatural or resource district.

3.1: i Village or Core

Hecla village acted as a control and transportation node in the context of the Total Human Ecosystem. Collective community images of the inhabitants' place in the world were formed by socialization in the school and church. At the contact between external economic forces and the ecosphere stood institutions, such as the fish buyer and the lumber company, which determined the exploitation of natural resources derived from the ecosphere. At the mediating point between the external human world and the local landscape ecology, Hecla village extended its influence over the whole cultural landscape of the island and its waters.

The institutions that were important to the people of Hecla on a communal level have been remembered and preserved under the new regime of the park management. The church, school and hall have been maintained, restored and reconstructed, respectively, and adapted to new uses. Together with other village structures they have a new role in tourism and a continuing role in the maintenance of links among former residents of Hecla Island.

3.1: ii Pastoral district

The pastoral district is a landscape unit characterized by an association of ecotopes associated with the interaction between domestic grazing livestock, the natural landscape and human control. Each ecotope has a different degree of human control, ranging from the built landscape of the farmstead to forested pasture with modification limited to the selective pressure of grazing and the effects of hoof trampling.

At present, this district is distinguished by the effects of past land-use. Present land-use has superimposed another layer with a pattern only partly congruent with that inherited from the past. Present land-use, which is primarily sightseeing, is concentrated in a narrow zone along the road and shore with a few nodes of greater intensity where inhabited places remain among the abandoned homes. A verge of variable width is

mowed, to a lawn height, along the road and in the yards of remaining houses, both occupied and abandoned. Reduced mowing frequency in the former hay fields has led to the operation of successional forces in the meadow vegetation community, with subsequent invasion of woody plants.

Adaptation of the cultural landscape to new cultural forces brought about by tourism and institutionalized maintenance is having a negative effect on the expression of the cultural forces that formed the landscape.

The characteristic features of this district define much of the image of the cultural landscape and lasting impacts of cultural activities still dominate the form today. It is this landscape that forms the core of the Hecla settlement and reveals so much of the way of life of its people.

3.1: iii Semi-natural or resource district

Occupying most of the island, this district of seminatural landscapes and minimally exploited natural landscapes was formerly used to varying extents for productive purposes. Over most of the forested portion of the island, evidence of former logging or fuel-wood cutting is visible to the ecologist or forester. However, twentyfive to eighty years of successional growth of the forest has produced forests indistinguishable to the casual observer from completely natural growth. The forested area is therefore no longer regarded as belonging to the cultural landscape.

The marshes on the west side of the island have not been hayed for years. The seminatural landscape of the wild hay fields formed a vital part of the cultural landscape during the agricultural period on the island. However, they were clearly seen as separate from the main cultural landscape. At present a new cultural force is active in the marshes adjacent to the causeway. A wetland enhancement program with cells to regulate water levels, has been constructed in the marsh. Wetland enhancement projects across the prairies have enhanced marsh hay harvests as well as supporting the main goal of wildlife

enhancement. Where compatible with the primary goal of the project the Hecla marshes could again produce hay harvests at times of serious shortfall of tame hay.

Analyzing and planning management options for the marshes as a cultural landscape is no longer feasible or appropriate. It should be analyzed as part of the natural landscape of the island, and is therefore not included in this study.

3.2 Description of form and function of the cultural landscape

3.2: i Linear settlement form

Early pioneers on the island recognized the advantages of settling close together on the shore for better communication and to share the best land. A letter dated January 30, 1877 was written by the settlers requesting lots 20 chains wide extending back from the shore to make 160 acres (McKillop 1979, p. 15). In the study area settlement became continuous along the shoreline. South and north of this area a few farms were scattered along the shore in patches of better land. A road generally following the shoreline linked the farms in the settlement. Along the road were found the farmsteads, each in the cleared area of a farm. The cleared land was contiguous in the cultural landscape zone, forming a strip of fields between the forest and the lake, with farmsteads, scattered trees, haystacks, and farm animals as elements in the landscape.

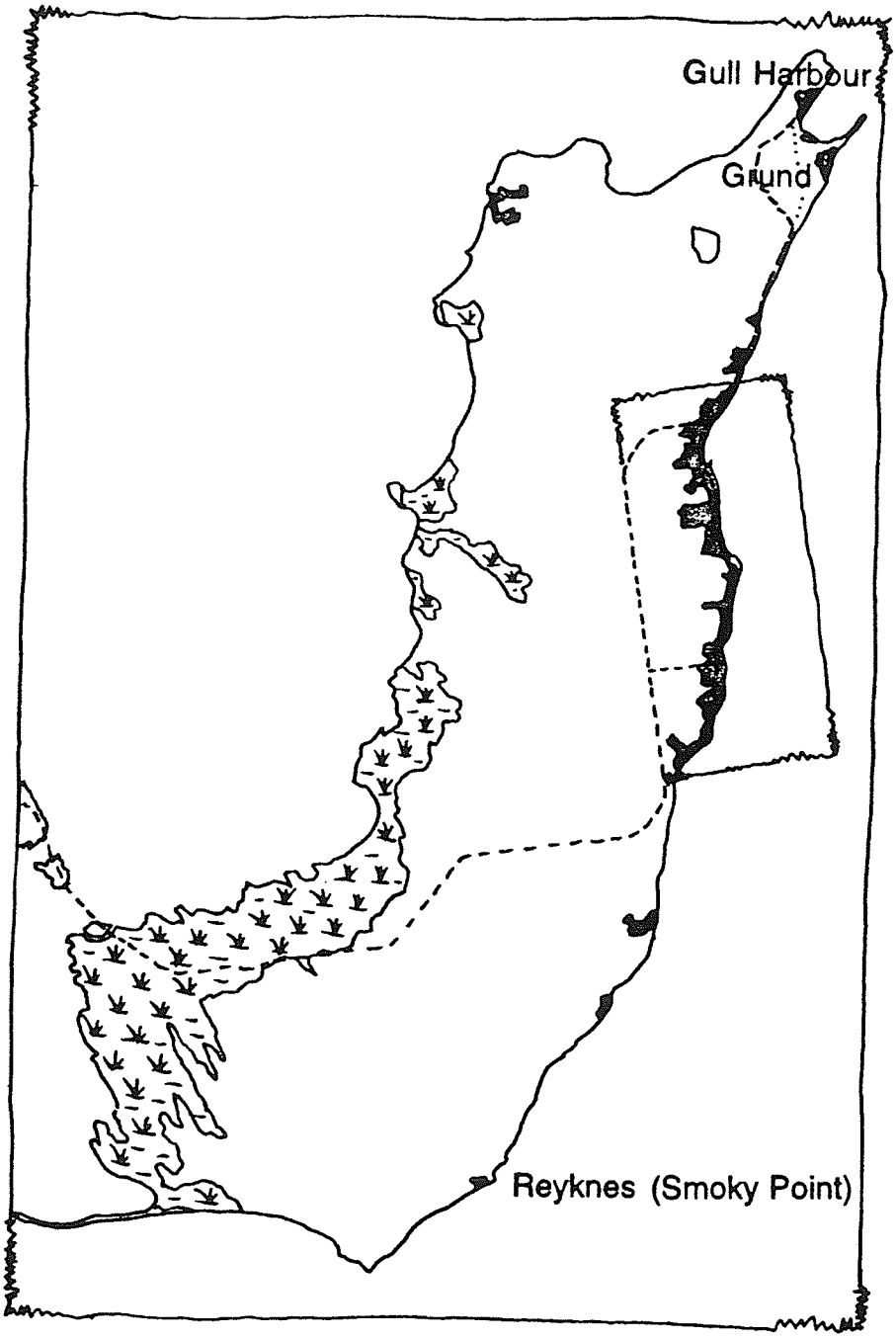


Figure 8: Map of linear settlement form, Hecla Island.

3.2: ii Farm

The farm was the main organizational unit of the cultural landscape in both the sphere of landscape ecology and in social relations. Clearing of land, haying, and pasturage of animals were organized at the level of the individual farm. As it exists now the cultural landscape gives the impression of being a single continuous cleared zone with houses and associated buildings set down at irregular intervals. The sense of the land being occupied by individual farms has been lost. At the level of social relations in the community, the family on its farm was the basic unit. The named farms did not correspond exactly to independent households. When a farm was subdivided for the next generation, the name continued to hold for the whole farm.

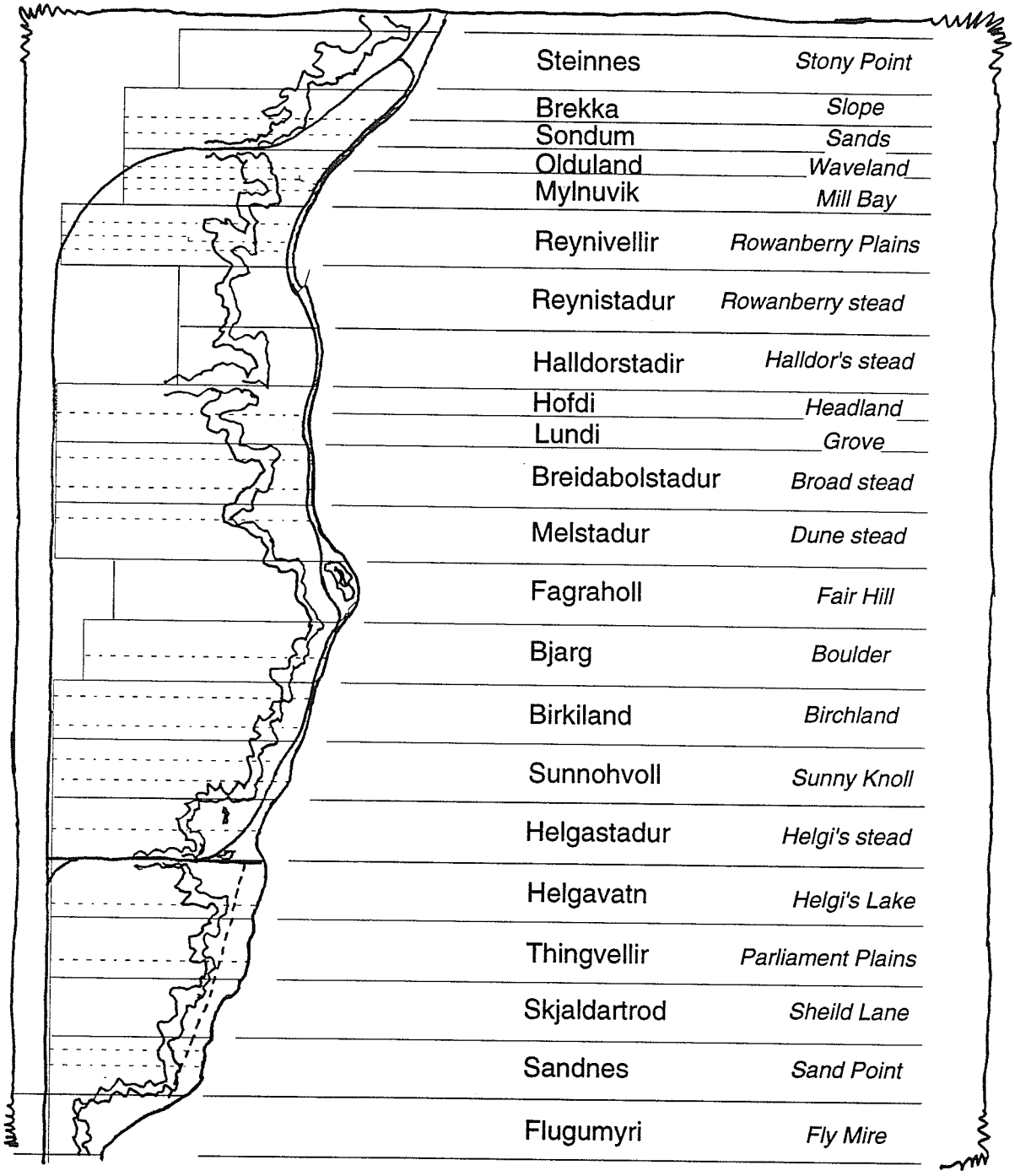


Figure 9: Farm boundaries and names within the study area.

Placenames

Following Icelandic custom of naming each farm, the islanders had a dense pattern of placenames in the landscape. Each 400 m (1/4 mile), or exceptionally 200 m (1/8 mile), of shoreline had its own name. The name applied not only to the physical features of the

land and farm but also to the inhabitants of a place. Christine Jefferson, of Reynistað, has this to say about use of names for farms or homes: "... names given to their homes became attached to them personally and very often were used in place of their surnames"(McKillop 1979, p. 73). Reynistað itself was named for red berries found in the bush. Reyniber, or rowan berries, and stað or staður, which is cognate to English stead as in homestead or farmstead are the elements of the placename. Placenames were based on three main themes. Some were derived from the immigrants' homes in Iceland. Phrases or words descriptive of the new homestead were also used. Pioneers also named their farms after themselves, for example Helgastoðum meaning Helgi's place.

Spatial organization of the farm

A typical farm had a farmstead near the shore road with associated outbuildings. The homefield was located close to the house nearest the shore on the best land. Beyond that was the main pasture. Bush pasture occupied an intermediate, ecotonal position between the pasture and the forest at the back of the farm. Often the farm also had land in the wild hay fields on the west side associated with it.

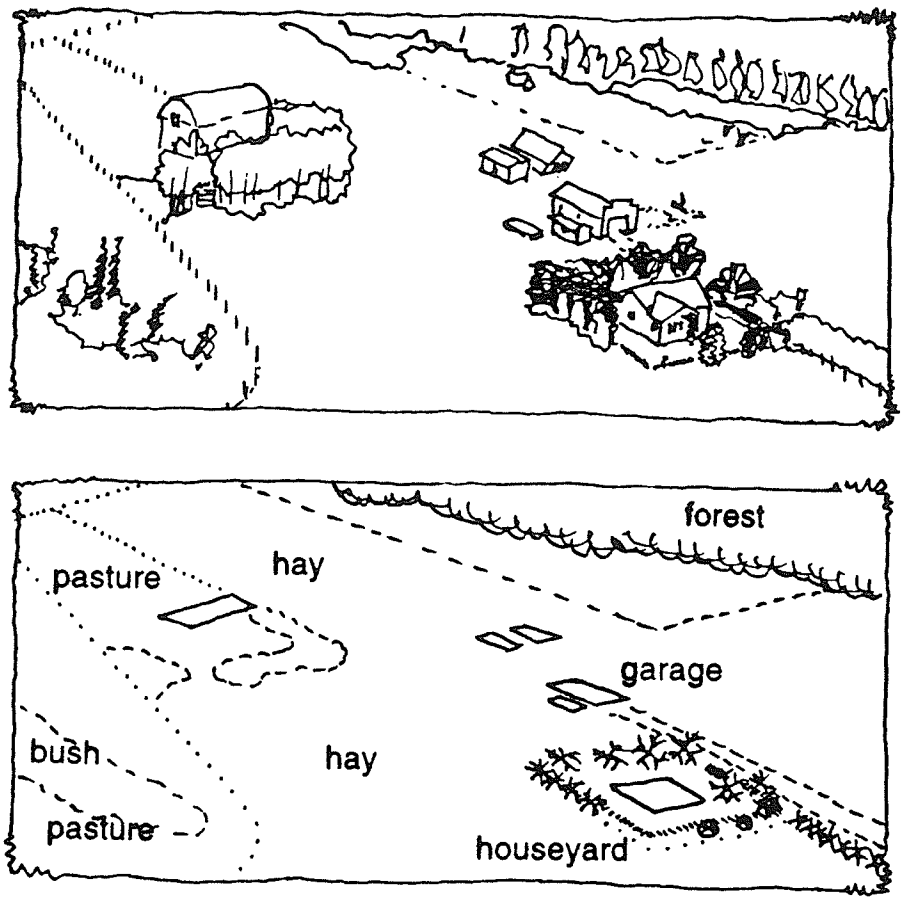


Figure 10: Spatial organization of typical farm. Aerial view of Flugumyri.

Farmstead

The farmstead consists of the house and outbuildings and the grounds on which they sit. A typical complement of buildings could include a house (with outhouse before indoor plumbing), summer kitchen, barn, cowshed, chicken house, various storage sheds including a net shed, garage, and perhaps an icehouse.

The House Yard

The house was almost always located a short distance back from the shore road, with a yard and porch facing toward the road and the lake beyond. The vegetation planted around the houses and yards has been abandoned in many cases and subject to a reduced and / or erratic maintenance in other cases. However, essential elements can still be deduced from surviving examples. To set the yard off from the open fields beyond a row

of deciduous shade trees, perhaps with a hedge, enclosed it on all sides. The yard was usually partly open to the front where it faced onto the shore road. Common ornamentals included typical old fashioned shrubs and flowers found on the prairies, as well as some of the more ornamental natives transplanted from the bush. Conifers were not favoured in plantings. Typical trees and shrubs used in ornamental plantings are indicated in table two.

Table 2: Common ornamental species

	Species	scientific name
Deciduous trees	Manitoba maple (native) American elm (native) green ash (native) willows	Acer negundo Ulmus americana Fraxinus pennsylvanica Salix spp.
Ornamental trees	Mountain ash (native) Crabapples	Sorbus americana Malus spp.
Ornamental shrubs hedge hedge	honeysuckle shrub roses common lilac caragana	Lonicera tatarica Rosa spp. Syringa vulgaris Caragana arborescens

The houseyard was part of the domestic sphere of the household that was generally the responsibility of the women of the household. It held the summer kitchen, where cooking and washing ocurred during the summer months, and was also the setting for the vegetable garden. The produce of the garden in fresh, stored and preserved forms made a significant contribution to the diet of the family.

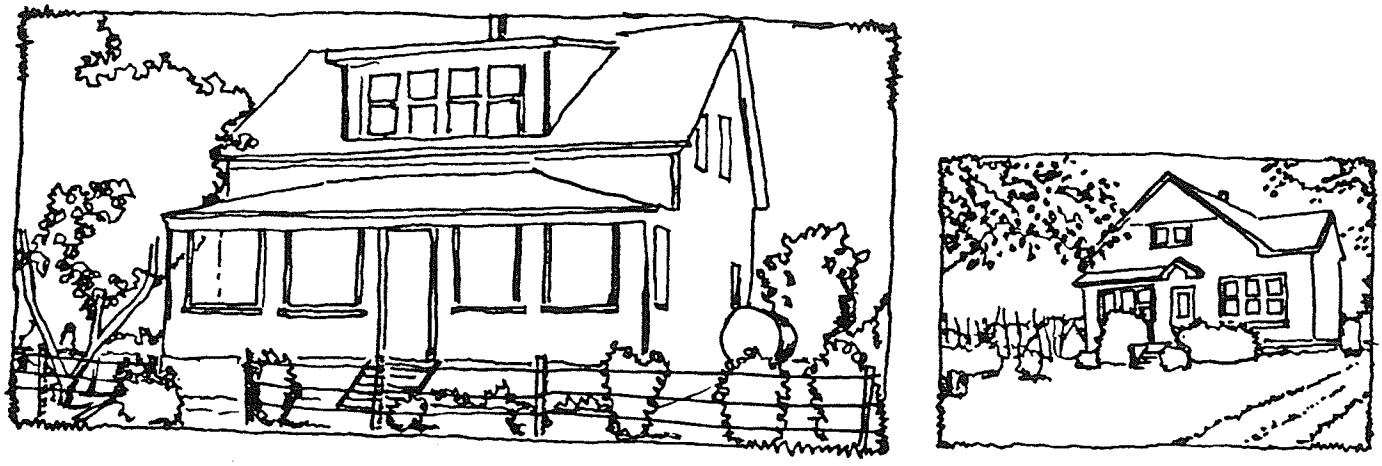


Figure 11: Houseyards at Breiðabolstadur (left) and Söndum, showing foundation planting of small shrubs and flowers, hedges of lilac or caragana, and shade trees on three sides opening to the lake.

Farmyard

The farmyard was organized to support both farming and fishing operations. Fishing operations required large areas of storage where nets, buoys and other fishing equipment could be stored between fishing seasons. Prior to the introduction of synthetic nets, nets had to be dried every few days to prevent them from rotting. Net reels, the large, open construction, wooden wheels used to stretch nets out to dry them were a conspicuous feature of the farmyard until approximately 1950. Between fishing seasons the small wooden skiffs used in fishing were also stored in the farmyard. Skiffs were turned upside down to keep the weather out. A few fishermen also had icehouses to store ice for icing down summer and fall catches. Spatially the storage sheds formed a loose grouping near the house and close to the water. In only a very few cases were sheds set adjacent to the shore accross the road from the house.

Barns tended to be small, story and a half frame construction. Most hay was stored outdoors as haystacks rather than in the hayloft of a barn. Barns were often set at quite a distance from the house, sometimes even isolated in the middle of the field or adjacent to the pasture at the back of the farm.

Homefield

The homefield was found at the front of the farm on the most fertile, best drained land adjacent to the lake. It was reserved for production of hay for winter fodder. This was the primary land that received manure to increase its fertility. When ground was occasionally broken for the sowing of a grain crop, this land was used.

Hay and Pasture

The transition zone between the homefield and bush pasture was the largest productive area in the farm. This land could be used for either haying or pasture depending on the time of year, the number of livestock being raised and access to marsh hay. Whatever the case, after the hay crop was cut and stored, livestock would be turned out to graze. On farms on higher ground with thin, stony till based soils, such as Steinnes

and Reynistað, pasture extended right to shore. These farms relied on the marsh haylands for their winter fodder.

Bush pasture

At the edge of the forest was an area where not all the trees had been cleared but the pressure of grazing kept the ground cover in a grassy meadow. Most of the conifers were cut down, with a few mature conifers left for shelter for animals. The main trees left standing were trembling aspen. The patchy nature of the bush pasture as it penetrated the forest resulted in extensive edge habitat. Removal of grazing pressure in a trembling aspen stand results in rapid regrowth from root suckers. Most of this zone is therefore now covered with a dense growth of aspen trees.

Forest

At the back of the farm where its legal limits extended back into the forest, was an area used for cutting wood, hunting, and trapping. Inland from the shore the lack of relief and poorly drained soils resulted in moist woodlands that were of little use when cleared. Near the village, in the northern part of the settlement, the farms extended back to the black spruce muskeg which the highway presently traverses. Trails led through the forest, accross the island to the marsh haylands on the west side in some cases.

Marsh Haylands

Each farm could have a certain acreage in the marshes for their own use. The marsh haylands were therefore part of the extended territory of the farm. Little or no clearing or fertilizing was needed to make the marshes yield abundant stands of grasses. The only time the marshes were actively exploited was during the hay harvest itself. During the winter the marshes were also visited to bring haystacks back to the farm. Cutting of wild hay can have a large impact on the floristic composition of the vegetation community. Cutting creates selective pressure on the vegetation. Plants which can sustain cutting and which flower and set seed before the meadow is mowed are at a competitive advantage over plants which are sensitive to mowing and which fail to set seed before mowing.

3.2: iii Village

The village evolved as an intensification of the linear settlement pattern on the island. The closest analogy in traditional village patterns is a one-sided street village. All buildings except for those associated with a dock or wharf were on the inland side of the road. The village stretched for 1.2 km (three-quarters of a mile) along the shore road. The three farms in the village (Reynistað, Reynivellir and Mylnuvík) underwent subdivision to provide land for community facilities, businesses and village lots.

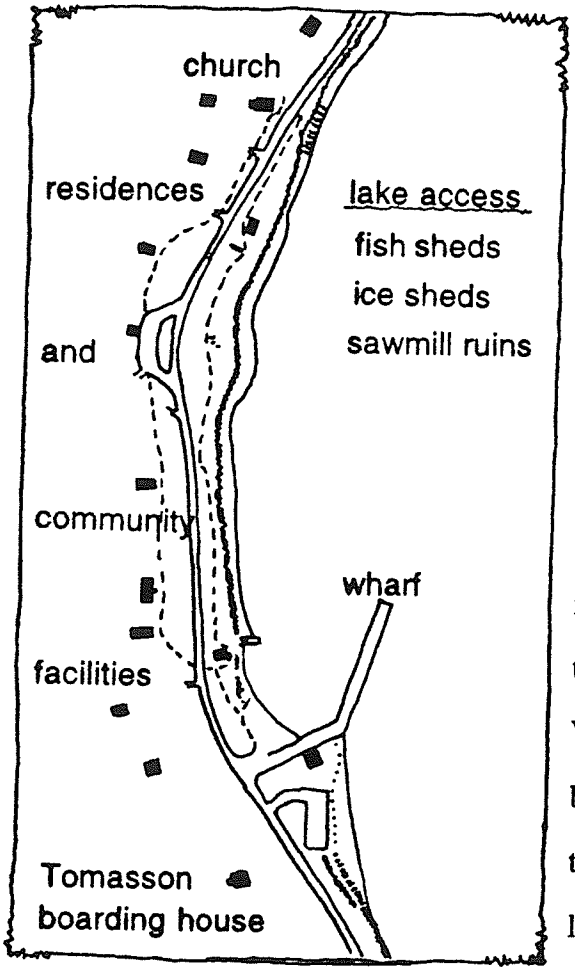


Figure 12. Hecla Village

Community facilities

The most important community facilities, the church, the school and the community hall are all located in the village.

The earliest church was built in 1890. In 1927, a new church was built to replace the original one, which was showing signs of decay. This church is still standing on the island today. The church continues to be instrumental in keeping the Hecla community together in its present extended state. Weddings and funerals are held in the church bringing friends and family back to the island to gather to mark important passages in their lives. The main cemetery on the island is located in the churchyard.

The school and hall were located adjacent to each other in the centre of the village. Their adjoining grounds played host to many activities including children's play, sports such as baseball, and special occasions such as picnics and sports days. Most social events were associated with either the hall or the

school. A typical social calendar for the year had its highlight in the Christmas season and was very active in the summer.

Table 3: Community Social Events

Month	Social Events
January	New Year's Dance
February	Valentine's
March	Help in Emergency concert
April	Ladies' Aid, first day of summer concert
May	Church Picnic and Dance (May 24th)
June	School Picnic
July	Sunday School Picnic Summer Dances
August	Summer Dances
September	
October	
November	Library Concert
December	Christmas School Concert Christmas Sunday School Concert

Source: Modified from McKillop 1979, p. 184.

In addition to the regular events, at least one or two plays were rehearsed and performed every winter. Like all the social events on the island, the plays were a community effort. "The Island people were the organizers, the entertainers and with all these events each year a great deal of time must have been donated by each and everyone. After each concert a dance followed and refreshments were sold"(McKillop 1979, p. 184). In addition to bringing people together to prepare and participate in these events, they also served as a fund raiser for community organizations. The Ladies' Aid, the library, the Help in Emergency fund, the hall committee, and the church all sponsored events and used the proceeds to benefit the community.

There was a recognition that the linear form of the settlement made it difficult for those at the north and south ends of the island to use these community facilities and attempts were made to alleviate the situation. As early as 1918, "they felt the necessity of having a second hall so that periodically it would be easier for the people living farther south to attend meetings and social functions" (McKillop 1979, p. 187). The southern hall was also used for church services and was later relocated to be used as a second

school. This school was three miles south of Central School and cut the distance the furthest children had to walk to school in half (McKillop 1979, p. 79). The residents most isolated from the village were those at Grund and Gull Harbour at the north end of the island. Population was insufficient to justify separate facilities such as a school and hall. Gull Harbour did have a store and the government fish hatchery.

Infrastructure

The location of the government wharf in its present position in Hecla village was vital for the prosperity of the village. Private docks were not as substantial and did not provide as much protection for ships and boats at dock. The construction of the private dock for the mill at Reynivellir is described below: "A plan for a dock was laid out. Cribbs (sic) were constructed from tamarac, there were of course several and these were spaced apart and anchored securely to the bottom of the lake by filling them to lake level with large rock. The depth of the cribb depended on the depth of the lake. A platform was nailed on the cribbs, large poles were fastened securely in order to tie the ships up safely. Into the platform they sank a railroad track, this enabled them to run the loaded cars of fish and lumber with ease to the awaiting ship or barge. The dock was built out from shore to ensure water depth, added to this was an L-shaped extension that served as breakwater shelter."(McKillop 1979, p. 92) The remains of this dock can still be seen at the shoreline by the ruins of the sawmill.

The prominent families of the island-used their political connections and lobbied to have the wharf constructed (McKillop 1979, p. 74). Once it was in place the development of the village was assured.

Businesses

Activity associated with the early private dock, including a saw mill and fish freezing plant, were important centralizing factors in the formation of the village. The wharf was also important to village merchants who purchased produce of the land and the lake and ran general stores. Their imports and exports went through the railhead at Selkirk via the

lake ships. Before the wharf was built, goods often had to be taken by smaller boat to the ship anchored offshore.

The post office in a small community is often a centre of activity. The post office in Hecla was usually operated by the general merchant in his store. This arrangement helped bring people in to do business in the village.

Residences

Social divisions in the village were reflected to a certain extent in village residences. The more prominent families who operated fishing crews, logging camps or general stores, lived in houses not much different from prosperous farm families on the island..Working class families lived in smaller gabled houses or shanties. During expropriation most of these smaller houses on lots on the northern and southern edge of the village were moved or demolished, leaving the substantial houses.

3.3 Cultural landscape ecology models

Our species is an important agent in shaping inhabited and resource exploitation landscapes. On Hecla Island the primary effects of the human factor were felt by the flora, fauna, vegetation and soil. Analysis of the ecology of the cultural landscape on Hecla Island reveals patterns that determined the form of the landscape. (See section 1.4: ii -Landscape Ecology and references therein for theoretical bases of this section.)

3.3: i Spatial model

The flow of energy and materials that connected the components of the cultural landscape depended on the relationship between three key components: the human component, domestic animals, and natural and tame grass lands. Livestock were the essential component enabling humans to concentrate the food energy they needed from the environment into a usable form. Animal power provided the mechanical energy needed to modify the landscape and harvest the materials needed for subsistence.

The most significant connections in the system were between livestock and the

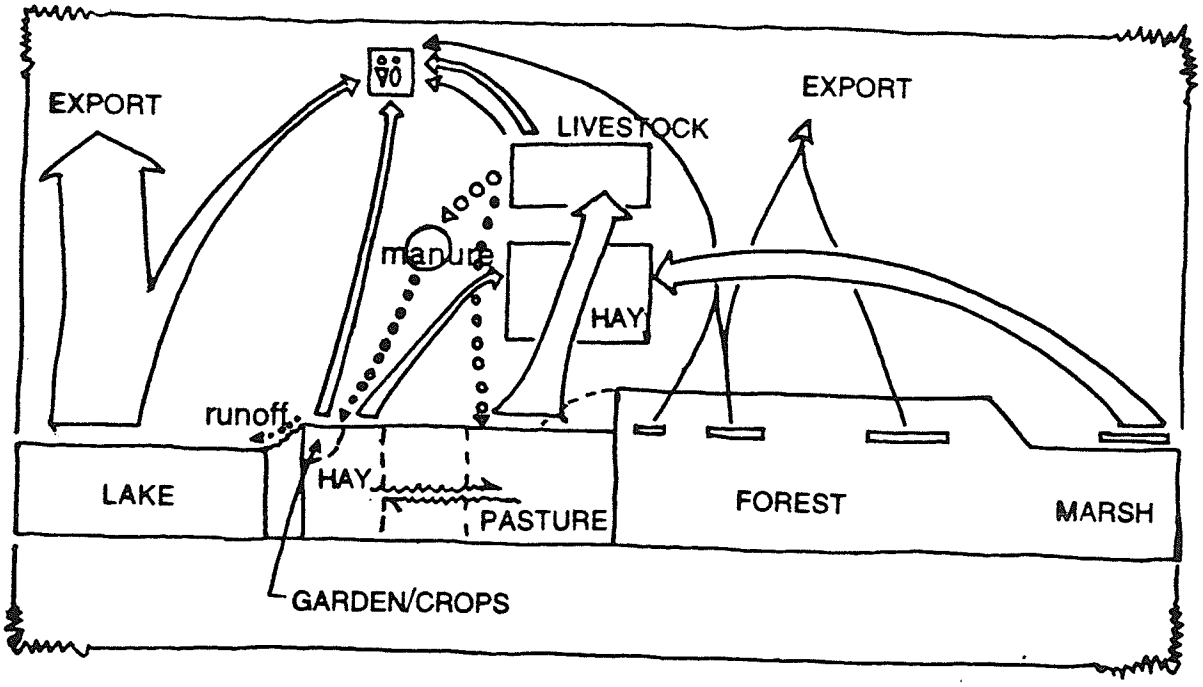


Figure 13: Spatial model of landscape ecology: flow of nutrients and energy (Source: adapted from Naveh & Lieberman 1984).

pasture and meadows. The winter feeding season lasted more than half the year, and livestock needed a reliable source of winter fodder. The natural meadows of the marshes provided an abundant supply of hay. Most animals were penned inside for the winter and their manure was stockpiled. Stockpiled manure was spread in the fall on the fields of the east side. The small area of hay meadows set aside on the east side gained fertility from transfer of nutrients in the manure. The eastern hay meadows provided a finer, more nutritious hay. The limited supply of cleared land on the east side was more valuable for summer and fall grazing than for hay meadows because of the ready supply of hay from the marshes.

Humans depended on the food energy they received from their livestock in the form of milk and meat. Mechanical energy supplied by draft animals allowed exploitation of resources from the environment. Indirectly, supply of vegetable food stuffs from the islanders' gardens depended on the maintenance of fertility in their gardens by the application of manure as a soil amendment and fertilizer.

Human control over the system was the factor that organized the cultural landscape. Human control led to the clearing of lands for pasture and hay, to the harvest of hay from the marshes, and to the construction of buildings needed to house and protect the animals. The organizational unit of human control was the individual family farm. Each farm had all the elements needed for production within the human—livestock—grassland system.

In most traditional livestock based farming systems in northern Europe, the spatial organization of the farming system proceeds from a core with labour demanding, intensively managed arable infield nearest the village or farm, through hay meadows to an outer zone of common grazing land. The physical conditions of Hecla Island have produced a partial reversal of this spatial arrangement. On the island, the availability of natural haylands pushed a more intensively managed process, hay production, to the hinterland and brought grazing lands close to the farmstead.

3.3: ii Hierarchical model

The physical landscape—geology, geomorphology and surficial deposits—is the foundation upon which the physical manifestations of landscape ecology and cultural artifacts appear.

Soils result from interaction between surficial materials, overlying vegetation and fauna, and soil organisms. Soils are the primary site of biogeochemical cycling between the earth, the atmospheric reservoir, and the biomass.

The processes of energy flow and nutrient flow through an ecosystem interact with the varied physical landscape and disturbance/succession cycles to create a landscape characterized by patches apparent at all scales of examination. Human occupation of the landscape introduces new disturbance and selection pressures, creating novel seminatural and cultivated landscapes. The impact of varying human management and disturbance regimes creates a new patch network superimposed on preexisting or modified environmental gradients.

Cultural artifacts created by human work in the physical environment bear a twofold relationship to human needs. On one hand they may be functional—relating to agricultural, subsistence, or economic systems. Most cultural artifacts also have meaning in the cultural realm. For some objects, communication in the cultural realm is their primary purpose.

Superimposed as another layer is the shared mental imagery of the landscape consisting of place names, mental maps and cultural imagery of place. Physical manifestation in the landscape is not necessary. A place may be remembered as the location of a prior object or event. If this layer can be said to have any location it is the local noosphere, the shared body of knowledge, 'common sense', myths and beliefs held by community members. In turn, the local noosphere is contained within and influenced by information from the global noosphere which is the imaginary space containing the

sum of human knowledge, or perhaps the imaginary space through which information is transmitted between people.

Culture transmitted through the local noosphere affects the landscape by influencing decisions on land-use, field patterns, farming systems, architecture, fence types, appropriate garden forms, etc. An interesting example of this phenomenon on Hecla Island is the transmission between the few local carpenters of several innovations in house design peculiar to the island (Dowsett 1984).

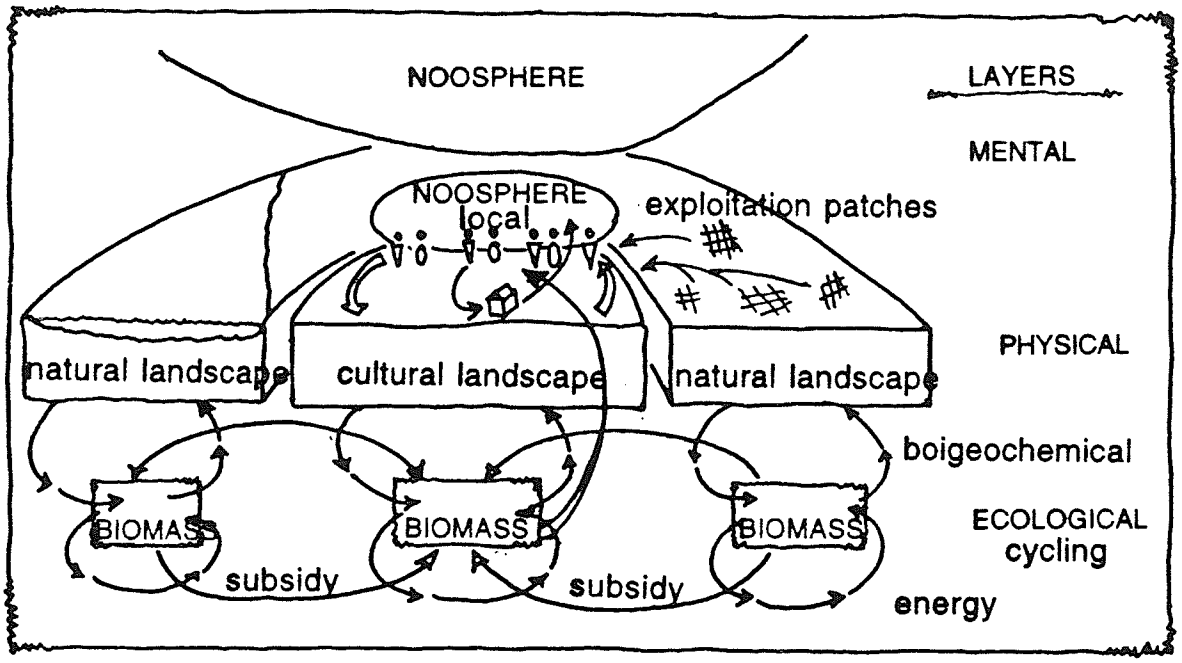


Figure 14: Hierarchical model of cultural landscape (Source: adapted from Zonnezeld 1972).

3.3: iii Temporal models

Time in landscape ecology can be considered in the context of the seasonal round of human activities and their effect on the landscape, and the evolution of the landscape through time. The seasonal cycle is a direct link between the landscape and human culture. Agricultural, fishing, and hunting-gathering cultures in mid or high latitudes are dependent on the seasonal cycle. In turn, the seasonal cycle of resource exploitation produces differential pressure on the landscape at different seasons. A historical perspective on landscape reveals successional forces within natural and anthropogenic

systems. The concept of the climax or potential natural vegetation has been important in ecology. Similarly, human use of the landscape trends toward more intense use as cultures evolve (Emanuelsson 1988).

Seasonal cycles of resource exploitation

Interlocking of several cycles of resource exploitation shaped the year for the people of Hecla Island. Fishing, agriculture, and logging had periods of maximum activity and impact during different seasons. All three were male dominated activities and had an important effect on the male workforce. In particular, fishing pulled men away from the island during the summer whitefish season.

Primary impact on the marsh haylands ocurred in August with hay cutting. This created selective pressure on the patches created by haying. Plants that flowered and set seed before the cut or perennials that can withstand cutting had a competitive advantage. A secondary peak ocurred in late March and early April with the muskrat harvest.

Hay lands on the the east side of the island were cut earlier in the season, late June to mid July. Spring or fall flowering plants were favoured. In pasture areas plants that flowered and set seed prior to the turning out of stock onto pasture were favoured.

Exploitation of wood resources ocurred during the season of frozen ground and continuous snow cover. This minimized the impact on ground cover protected from compaction and erosion by machinery. Opening of canopy produced by logging favoured opportunistic, early successional species.

Loss of labour from the island during summer and fall fishing seasons discouraged intensification of farming.

Cultural Landscape Development

The development of the landscape during intensification of use from a hunter-gatherer society to permanent intensive agricultural societies is the subject of Emanuelsson's (1988) model of the development of the cultural landscape. He proposes "a model for the interaction between humans and nature in which the consequences for

nature are emphasized." Five technological levels with increasing impact on the environment, are separated by four main steps. These levels are: 1) Hunter-gatherer, 2) Shifting cultivation and/or pastoralism, 3a) Farming in permanent fields, 3b) More efficient permanent fields, 4) Use of artificial fertilizers. Using Level 4 technologies it is, "in theory possible to use the total land area as arable fields. ... Nutrient source areas are redundant, and meadows and pastures are also artificially fertilized."

The three levels which have affected the development of the cultural landscape on Hecla Island are levels 1, 2 and 3a. Before European settlement, Hecla was occupied by hunter-gatherer societies. According to Emanuelsson, "Such a society will concentrate a small amount of nutrients from the environment into the area around their habitations. The impact on the environment will be similar to that produced by other big omnivores." An important exception to this pattern must be noted—fire. Hunter gather societies which use fire to create better habitat for game hunting, or to maintain an open wood with high productivity of natural food sources, can have significant impact on the landscape. However, fire was not used as a landscape modification agent in the boreal forest, of which Hecla is a part (Pyne 1982). The arrival of the pastoral culture of the Icelanders on the island introduced a new level of landscape use. The islanders were not pure pastoralists and the technological level they used was a blend of Level 2 and 3a. The dividing line indicating higher intensity of landscape use in permanent fields is the transfer of nutrients from grazing and fodder production areas to fields, by conversion to manure by livestock.

In the regional context of the Canadian Prairies, the cultural landscape has jumped from a hunter-gatherer level to Level 4, extensive farming with artificial fertilizers, via an intermediate pioneer phase which relied on the virgin land phenomena. The nutrient reservoir in the virgin soils of the Prairies allowed several decades of farming with no fertilization from either manure or artificial fertilizers. On the wooded, northern frontier

fringe of the Prairies, of which Hecla Island is a part, this simple model of landscape development did not apply.

3.4 Visual analysis and typology

Visual and aesthetic typology of the cultural landscape results from the interaction between natural physiography and vegetation and cultural patterns indicated by artifacts, field boundaries and characteristic seminatural and cultivated vegetation.

In its new cultural role as a tourist landscape, the landscape serves a role in sightseeing and interpretation of the cultural and natural history of the island. The visitor's perception of the landscape as a sightseer can be sharpened and made more meaningful through provision of visual clues to meaning and visual stimuli that increase the sensual appreciation of the cultural landscape.

3.4: i The landscape as a whole

Visual character

The lakeshore location of the Hecla settlement creates a profound contrast between water on one hand and land on the other. Human settlement on the island depended on the use of resources from both land and water and thus needed access to the water and access to land suitable for their crops and livestock. The resulting landscape has a characteristic structure with most dwellings closely tied to the shore and access to water and an open landscape cleared for agriculture surrounding the dwelling and extending for a variable distance into the forest.

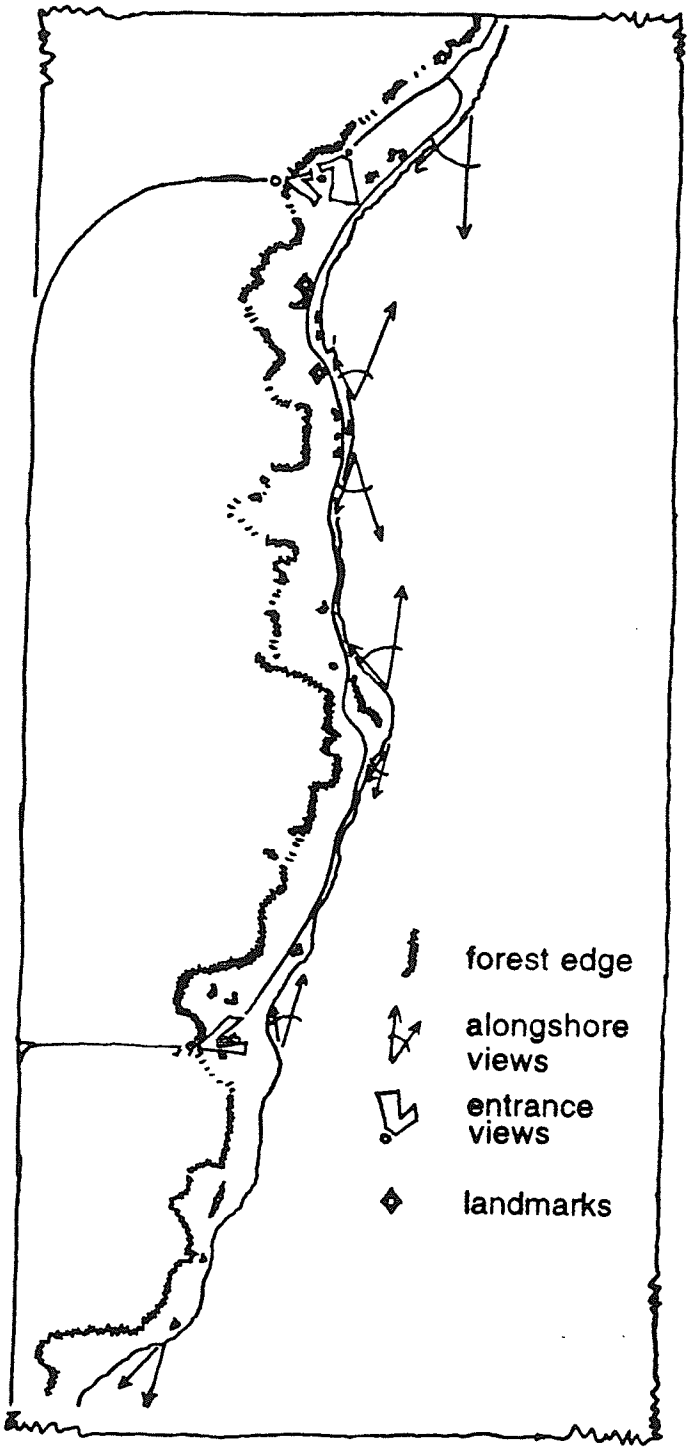


Figure 15: Visual character of the landscape.

Visually, this landscape extends to infinity in one direction, is closed in the opposite direction, and in the perpendicular direction is characterized by variable views with the classical formula of foreground, middleground and background elements. According to Higuchi (1983), this "middle-distance view, in which juxtaposition of topographical patterns gives a strong sense of depth, is what we usually think of when we say landscape." Views along the coastal topography across bays with the next vista hidden by a headland, fit this formula admirably. The shore is neither strongly indented nor overly rugged—enhancing the gentle, pastoral character of the landscape—not overwhelming it.

The infinite extent of the landscape as it extends over the lake creates a cosmic landscape (Jakle 1987, p.91). The east shore of the lake is barely visible as a thin line on the horizon. In conditions of reduced visibility in fog, rain, snow or blowing snow the east shore is obscured, and often the horizon itself

may disappear creating a illusion of infinity. The vast presence of the lake is always part of the awareness of the landscape.

The open cultural landscape is bounded by the presence of forest to the back. An open, grassy meadow vegetation forms the matrix of the open landscape with isolated structures, trees and groves interspersed in the open landscape as pictorial elements framing views.

Spatial closure by the forest is strong. The forest edge acts as a wall with little visual penetration to greater depths or hint of openings beyond. Encroachment of the forest edge has concealed the extent of the interpenetration of forest and pasture. The forest edge can be maintained and in cases of excessive advance may be restored.

Lake and lakeshore

Water, represented by Lake Winnipeg, forms a significant element of the cultural landscape. Numerous studies of landscape preference and evidence from landscape design precedents all indicate that landscapes with the presence of water are preferred. Coastal scenery, such as that found in the study area, has always been preferred for human habitation and tourist or resort locations.

The winter landscape loses the element of water under a blanket of snow and ice. The vast white expanse of the snow covered lake bears a close resemblance to the open prairie of the agricultural south of the province.

Most sightseers see the landscape while travelling along the shore road or as pedestrians in the village. Aside from the harbour area in Hecla village, there is no place that projects the cultural landscape towards the lake. The lakeshore acts as an edge separating the landscape and the viewer from the water.

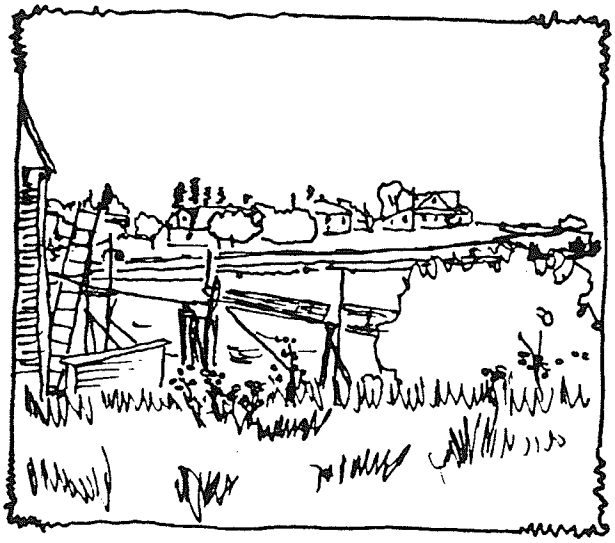


Figure 16: Lake access structure: ramp from fish shed to dock, Hecla village.

The numerous landing places along the shore have disappeared. A place to pull a wooden skiff up on shore was important for the day-to-day nearshore fishery. A simple sand or shingle beach was adequate for the small boats used in this fishery. In other cases, boulders were cleared from a shingle beach covered with glacial lag boulders. Where a high bank backed the beach, a wooden ramp could be constructed to ease movement of equipment and fish boxes from the boat to land.

In the new context of a tourist landscape, access to the water is not required for small boats for fishing and transportation, but for appreciation of the landscape and for interpretation of the historic role the lake played in providing a basis for the settlement.

Juxtaposition of country/wild/nature

Most national and provincial parks preserve wild areas, if not necessarily wilderness, and therefore serve to protect the values of the wild and nature. The attraction of the wild is a scenic landscape outside human control with a scale, grandeur or ruggedness that suggests it cannot be tamed. The attraction of nature within a landscape is the presence of native species and the opportunity to observe and preserve those species and the ecosystem of which they are a part (Brotherton 1986). In the cultural landscape on Hecla Island, the additional attraction of a settled countryside is very closely juxtaposed with the wild and nature.

These attractions are based on distinct values most individuals hold to a greater or lesser extent. By appealing to each of these values, most sightseers will find something to attract them within the cultural landscape. One person may especially appreciate the

wide lake and rugged cliffs, another, well tended dwellings set in ordered fields, while a third may visit to see flocks of pelicans soaring over the lake.

The separate value of each attraction is enhanced by its close association with the others. Human use of the landscape was not intensive enough to destroy the values of a wild and natural landscape. The land was farmed and brought into use in the not too distant past and marks of this pioneering phase are still visible. The close proximity of the settled landscape and the encroaching forest is part of the Canadian experience (Maclaren 1989). There is usually a dynamic tension between the two as the forest retreats before clearance for agriculture or farmland is abandoned and trees creep in. In the situation on Hecla, this process has been halted; the intention is to preserve the balance. The evidence of coexistence of nature and culture appeals to the hope that nature can be preserved in a world increasingly dominated by humanity and technology.

Pastoral images

The pastoral myth is a long enduring archetype in western civilization. From the time of the ancient Romans to the present day, the image of a pleasing rural landscape with peaceful livestock grazing has appealed to those wearied of the trials of city life. This image enjoyed a strong resurgence during the English picturesque and romantic movements, when the pastoral ideal was incorporated in the gardens of the great estates of the English countryside. Grazing livestock on a pleasant sward became one of the picturesque elements of the landscape garden. In contemporary urban society, the family farm has become romanticized as a symbol of an era when the yeoman strength and independence of the farmer was the basis of a democratic society. When combined with the picturesque qualities of a pastoral landscape this can become a powerful symbol of the strength of the land and of a people closely dependent on the land.

In the case of Hecla Island, the pastoral myth confronts the reality of an actual pastoral society. Dialogue between myth and historical actuality informs understanding

of the cultural landscape. Pastoral images may play a role in the interpretation of the cultural landscape.

Figure 17: The open landscape of hay fields was maintained as a working landscape but also is a symbol of the life of the islanders.

The pastoral landscape was a working landscape but loss of functional buildings and agricultural processes may create a false impression of the landscape. Return of grazing and haying could restore the pastoral basis of the landscape.

Evidence of the past and the passage of time

Cultural landscapes should preserve evidence of the passage of time (Roberts 1994). Unlike most landscapes in contemporary urban and rural North America where rapid change has obscured the past, Hecla Island has escaped massive change. Hecla, in common with many other areas, experienced rural stagnation and population decline in the postwar era, but unlike most places this did not result in the wholesale loss of structures or the conversion of small scale rural landscape to industrialized agriculture or second growth forests. A sense of time is imparted by heritage buildings and by ruins, that is abandoned structures in the landscape. In the new, rapidly evolving society and landscape of the Canadian prairies the shallow time of our grandparent's generation is enough to produce a connection with the past.

The most immediately obvious manifestations of the surviving past on the island are historic structures. In the visual appreciation of the cultural landscape, several of the

more prominent structures serve as landmarks orienting the sightseer to their position in the village. Other structures occupy a position in the focal points of views; organizing the landscape into a series of vistas. Other less conspicuous structures primarily function in creating a fabric that establishes a background rich in detail of the preserved past.

The larger scale landscape of meadows, field boundaries, roads and yards forms a milieu necessary for the understanding of the past as a complete system, rather than as a series of artifacts divorced from the context of their use. This landscape, although intact in the largest sense, has lost its integrity. Reestablishment of the field boundaries, fences and agricultural and fishing support features will place existing historic structures and landscape features in the context of the subsistence and commercial economies that supported settlement on the island and their interaction with the environment.

Meaning and legibility

The status of the landscape as a relict of earlier processes has lead to a loss of clues to meaning in the landscape. Meaning can be restored to a landscape divorced from the culture that formed it by reintroducing agricultural activities. Agricultural activities and elements play a role in interpretation of the history of the settlement and the way of life of the inhabitants. By restoring function to the meadows and pastures the landscape becomes more legible; the viewer can see why this cleared area is there and how it was used. Increased legibility of the unique structure of the settlement will allow the viewer to appreciate the response of the settlement to a unique environment.

3.4: ii Visual and spatial patterns

Survey and field patterns

The square pattern produced by the township and range survey on the Canadian Prairies is modified on Hecla Island by local influences to an extent seen in only a few other regions of the Prairies. Icelandic settlements in New Iceland display perhaps the best example of an adaptation of the survey grid to accommodate needs of homesteaders for access to their land. Although in many respects similar to the river lot survey found

along the rivers of the Red River settlement, Icelandic river and lake lots were based on the township and range system. A typical lot was one quarter mile (400 m) wide by one mile (1.6 km) long, and was oriented either north-south or east-west depending on orientation of the shore and its intersection with section boundaries. This system is best developed along the Icelandic River between Riverton and Arborg, and along the east shore of Hecla Island.

At present the survey pattern has lost definition and legibility in the landscape. Field patterns have been lost with removal of fences and merging of fields into a continuous amorphous whole lacking the rhythm and punctuation set up by field boundaries.

Rhythmic visual patterns

Linear experience of the cultural landscape is produced by encountering a rhythmic succession of views. Gentle indentations of the lakeshore produce a series of headlands and coves which alternately restrict views and then open out into a vista or panorama as a gentle rise is crested or the road curves. Open meadow landscape is interrupted in a few locations by a grove. Where open meadows narrow between forest on one side and a grove on the other a visual constriction or venturi effect is created (Jakle 1987). The visual pattern created by a closely spaced series of houses is now encountered in only a few short stretches of shoreline. Formerly the continuous sequence of houses created a dense rhythm that tied the settlement together. The new discontinuous pattern creates a sense of clumps of settlement set in a larger rural landscape.

3.4: iii Landscape Zones

The next level of visual analysis and typology can serve as a framework for management decision making regarding landuse and design. The landscape is analyzed and divided into zones of similar typology and visual character. Intersection between landscape grain produced by late glacial ice movement, generally oriented northwest to southeast, and the generally NNE to SSW trending shoreline underlies the series of zones

encountered along the shoreline. Human land-use decisions and survey patterns dictate the details of zone boundaries.

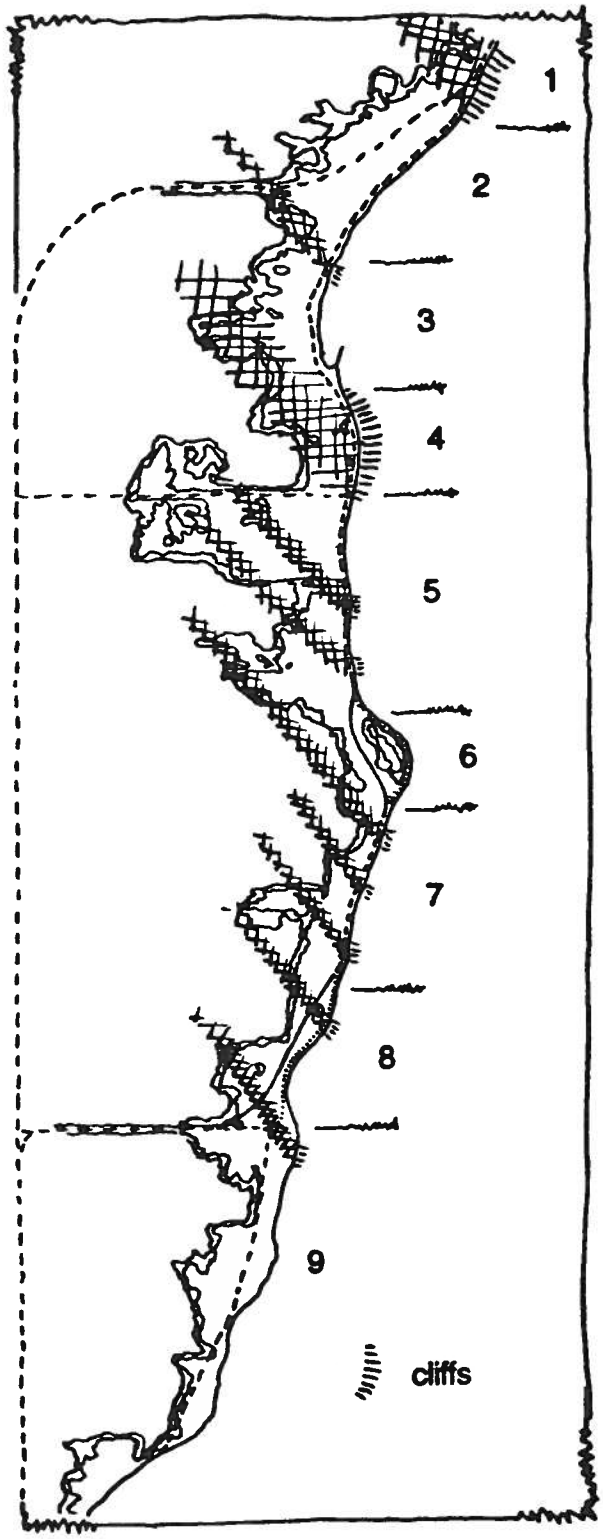


Figure 18: Intersection of ridges and shoreline to create landscape zones.
(Source: interpreted from vertical aerial photos)

The direction of last ice movement is recorded by low elongate ridges with a relief of one to a few metres. Where these ridges intersect the shore, high banks or low cliffs are created where wave erosion has truncated the ridge. Headlands typically correspond to these ridges, but not in all cases. This pattern affected human settlement—low shorelines were preferred for ease of access to the lake and cliffs received sparse settlement. The cultural landscape zone is bounded to the north by a shoreline of almost uninterrupted cliffs.

Zones are numbered consecutively from north to south. In most cases farm boundaries or roads are used to define boundaries.

Zone 1: Located above a cliff shoreline, this zone corresponds to the farm of Steinessi, and is 800 m (1/2 mile) in width. The buildings of the Steinessi farmstead are gone leaving an open field where the highway intersects the shore road and the access road to the staff

building and maintenance yard.

Zone 2: Encompassing the farms of Brekka, Söndum, Ölduland and part of Mylnuvík, this zone stretches along low shoreline from the slope at Brekka towards the village. The shoreline is a smooth concave curve with the landmarks of the church and dock clearly visible to the south. No ridges break the landscape and the land is low and fertile. Two drainage ditches were dug along the north and south boundaries of Söndum—interrupting a natural watercourse that curved through from the NNW to the shore in Söndum.

The highway traverses the open fields of Söndum and Brekka. This is the only opportunity to expose highway travellers to the attractions of the cultural landscape. The landscape in this zone should be designed to display the essential characteristics of the landscape, pastoral images, vistas over the lake and a clear sightline to the church as a landmark. The interpretive opportunity of grazing and hay making will add meaning to the landscape.

Most of the houses in this zone are still in place, preserving the close linear settlement pattern. The southern extension into Mylnuvík previously was part of the village before houses were removed, changing the character from dense village to open rural landscape.

Zone 3: The Village.

The Tomasson Boarding House stands as a landmark at the southern boundary of the village in its location at the top of the slope leading to the cliff. The northern boundary is slightly beyond the the church, including the Solmundson Gestahus at Mylnuvík. The harbour sheltered by the government wharf faces the heart of the village. The shoreline is generally low enough to permit easy access but a low ridge reaches the shore in a three metre cliff in front of the church. The concave shoreline allows vistas accross water of the numerous historic buildings and landmarks in the village. The wharf is a favourite vantage point for photography.

The building fabric is almost complete. The buildings are not set in a consistent line and the variation of setback sets up an interesting undulation. Two large buildings are also set on the lake side of the road. One, the fish shed at Reynivellir is situated on the shore above a private dock. The other, the Hecla fish shed is set beside the wharf on the beach sediment that has filled in the land on the south side of the wharf.

Zone 4: This zone begins with the cliff and stretches south to the section line road. The thin upland soil supports shorter grass cover and junipers grow in the stony soil. The shore road passes through an open grove of mature spruces—allowing glimpses of the village to the north. The cliff top provides an excellent vantage point for a view of the village spread out along the shore of the bay beyond.

This zone has been cleared of all buildings, but formerly had several small lots with village houses. The open landscape is an excellent opportunity for walkers from the village to experience the vistas of grassy meadows that can be seen once the sightseer ventures back from the shore road.

Zones 5 & 7: These zones are similar in many ways and perhaps best exemplify the visual characteristics of the cultural landscape. A number of small low ridges intersect the shoreline in each zone. The shoreline is composed of an alternation of high and low shores that present a rhythmic succession of views. Sufficient of the building fabric remains to preserve the relationship between lake, road, farmstead and meadows.

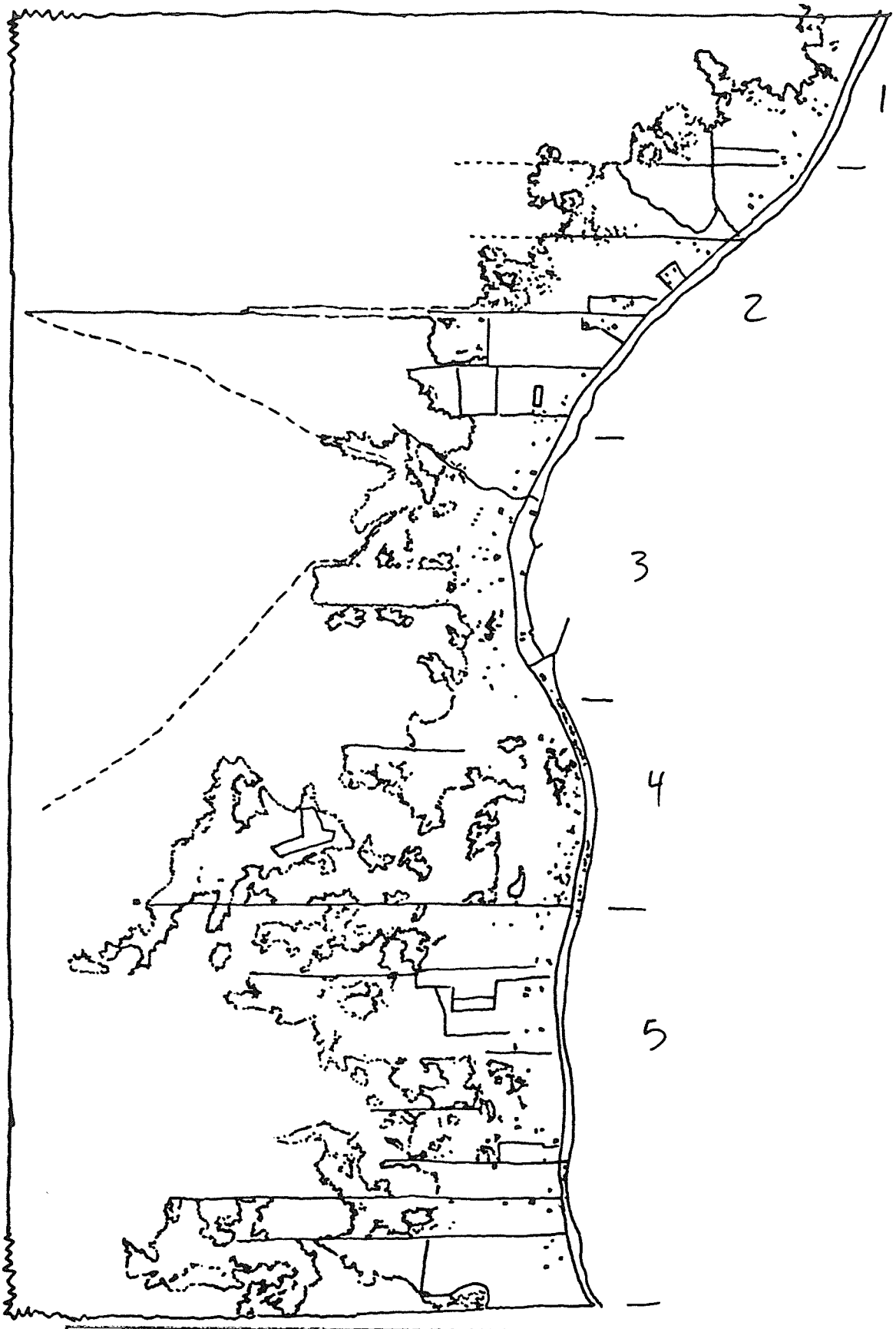


Figure 19: Landscape zones **1** to **5**, based on 1949 aerial photo.

Zone 6: Separating zones 5 and 7 is a low blunt point extending into the lake. The point is covered with a clump of forest that constricts the open landscape of meadows to a narrow band. The shore road has been relocated away from the lake shore to higher open ground. Curves on the road have been constructed to a modern high speed standard, not the intimate following of the shore found along most of the length of the road.

The open landscape through which the road passes is important to preserve visual contiguity of the cultural landscape. There is an opportunity for a roadside turnout or point of pause to interpret the old shore road where it has been relocated.

Zone 8: From Sunnuhvoll south to the access road back to the highway there is a zone with a continuous low shoreline including a bay with a sand beach. Only one abandoned house with accompanying net shed is left in this zone. Through most of the zone the shore road has been relocated inland and constructed to a higher speed standard similar to a highway.

This is an alternative entrance zone to the cultural landscape and opportunity for traditional agriculture to act as an introductory interpretive agent is high. Attention should also be focused on the first views of the landscape and the lake as a viewer in an automobile emerges from the forest. The extension of the section line road to the shore is a good opportunity for access to the lake with a vista across the bay and down the shoreline.

Zone 9: This southern extension of the cultural zone has a predominantly low shoreline with sand beaches common. The shore road is preserved here and tends to follow a more inland course than in zones further north, most houses are close to the shore on the lake side of the road. It is off the main traffic flow on a dead end. This zone contains significant amounts of private land and several residences that are occupied at least seasonally.

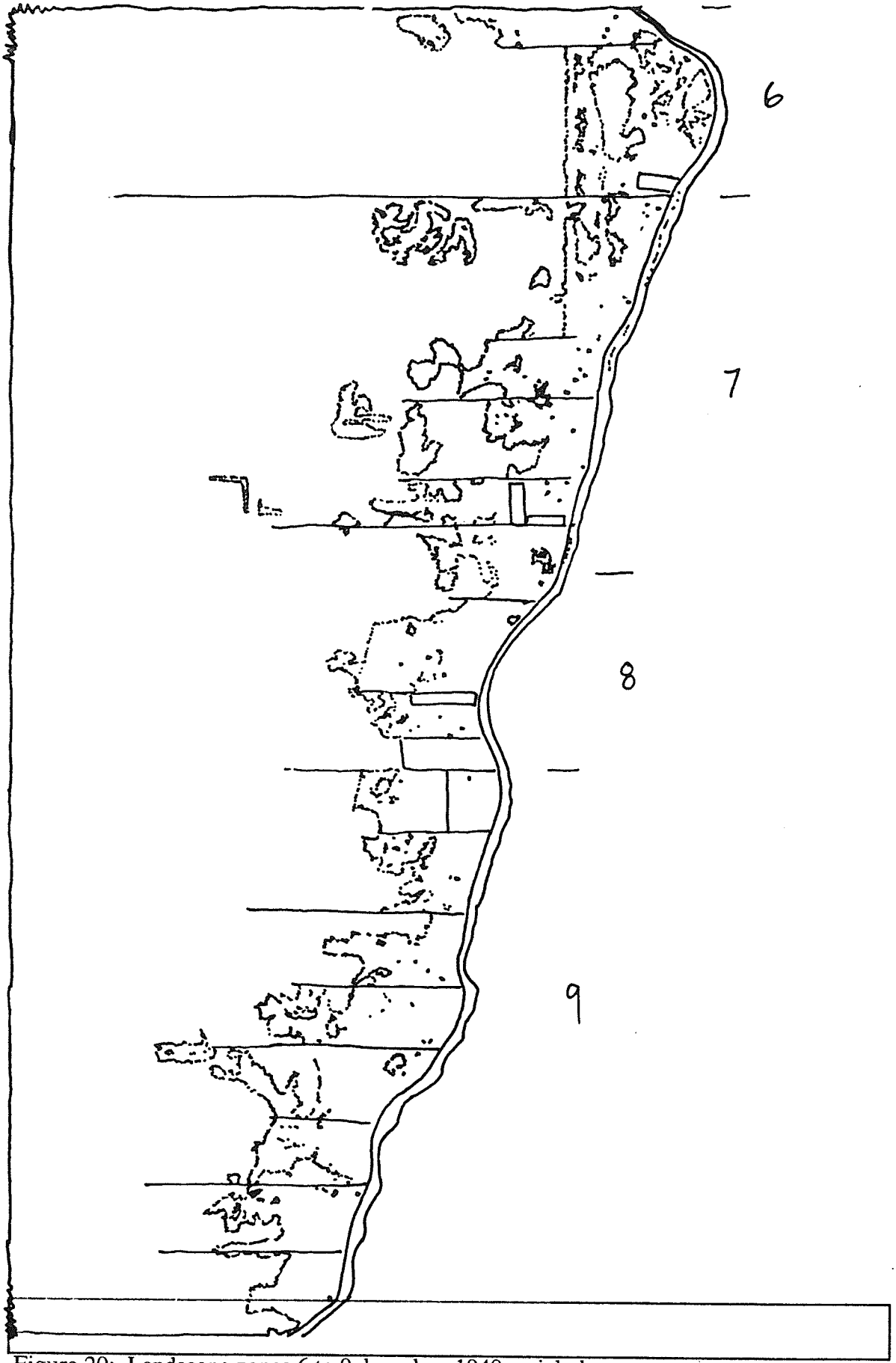


Figure 20: Landscape zones 6 to 9, based on 1949 aerial photo.

3.5 Essential characteristics of the cultural landscape

Understanding of the essential characteristics of the cultural landscape as it existed and in its present state form the basis for management policy and design decisions.

The cultural landscape was a working, inhabited landscape that was formed by numerous individual decisions over a long period of time. This evolutionary history created a landscape with characteristic form and functional relationships. The present landscape has lost most of its functions and inhabitants. The continuity of traditional uses has been interrupted but a new integration of recreational and productive uses can produce a landscape that is inhabited, cared for and which will maintain the essential characteristics of the cultural landscape.

Delimitation

village
- was a service, control and residential centre.
- is a service and heritage interpretation centre.
- goal is service and heritage interpretation centre.

Description: Form and function

linear settlement form
- was a continuum with a node of concentration
- is a node with remnant points and gaps
- goal: interrupted continuum with a node

farm unit form
- was a functional grouping in productive landscape with presentational front.
- is scattered remnants.
- goal: reconstructed example and new, reoccupied form.

farm unit function
- was hay & grass fed to livestock and fishing.
- has no function.
- Goal: hay and grazing livestock system.

houseyard
- had a characteristic form and elements.
- Goal: restored with guidelines on appropriate form and elements.

house
- was a characteristic vernacular tradition.
- Goal: restored or new construction with guidelines.

Visual analysis and typology

Landscape as a whole

water

- was omnipresent with many access points.
- is omnipresent with few access points.
- Goal: maintain access to the water visually and increase access points.

country / nature / wild juxtaposition

- existed in harmony.
- loss of country character with nonproductive landscape and loss of wild character with manicured landscape.
- Goal: enhance all three.

pastoral

- was an open grassy landscape with grazing animals and functional structures.
- is an open grassy landscape that has been reduced in area.
- Goal: open grassy landscape with evidence of pastoral origin.

evidence of past

- was palimpsest of changes during period of occupation.
- has suite of historic buildings and some evidence of landscape change.
- Goal: increased legibility of past.

Visual and spatial patterns

survey and field patterns

- were based on 1/4 mile wide homestead accommodated within Township and Range survey.
- pattern units have been obscured
- Goal: enhance legibility of units and overall pattern.

visual patterns: Zones

- recurrent pattern based on complex interaction between physical environment and cultural activities.

Section 4: Landscape Management

4.0: i History

After approximately twenty-five years under the stewardship of the Parks Branch, the cultural landscape in the study area is still legible. How long this condition will last depends on the care taken in the maintenance of the landscape. In the last decade, following the adoption of a management plan, a more activist approach to restoration and stabilization of structures has been followed.

Much of the restoration effort has been directed to the Hecla village area. An interpretive walking trail follows the shoreline from wharf to churchyard. The school and Sigugeirsson frame house have been restored. The frame house has been adapted as a museum of island life. The hall has been rebuilt at a slightly larger scale to accommodate social events in the village, such as wedding receptions or reunions. Four of the houses in the village are still occupied. The Solmundson Géstahús lies north of the church in Mylnuvík and has been adapted for use as a bed and breakfast. The Sigurgeirsson house on Reynivellir, the Williams house, and the Tomasson house on Reynistaður are also still inhabited. The general store and gas pump in the center of the village still operate during the summer. The greatest loss of residences occurred in the northern part of the village where several residences were moved or demolished. Several small houses on lots south of the main Reynistaður house have also been lost.

Beyond the village, gaps have opened in the linear settlement as houses have either been moved or decayed to the point of destruction. A program of stabilization should limit the continuation of this trend in the short and medium term. In the long term the inherent nature of wood construction will require more extensive restoration to maintain these buildings. A category of buildings that was conspicuous in the cultural landscape but that now is much reduced is farm buildings. These buildings began to be abandoned well before the island was converted to a park. Widespread adoption of internal

combustion tractors in the post war era led to a marked decline in the use of horses. Together with the decline in farm operations and fishing as out migration proceeded, this led to abandonment of farm buildings. Neglect during the period of park stewardship has accelerated this decline. Farm buildings are perhaps the most endangered element of the landscape under current practices and their loss will leave a distorted image of the cultural landscape as viewers see only houses and not buildings used in a working landscape.

Present maintenance practices tend to obscure the former functional units of the landscape. Fence lines have long since disappeared. The mown verge along the shore road obscures the distinction between house yard, and former hay field and pasture. Invasion of woody plants into the fields is allowed by long intervals between mowings.

4.0: ii Management in a dynamic system

Preserving the status quo in a dynamic evolving landscape is a difficult task. Actions must be planned that will arrest or reverse the processes of decay and succession. Artifacts are subject to entropy—the inevitable loss of order in a closed system. Only by applying energy in the form of maintenance or restoration can artifacts be preserved.

In an inhabited landscape maintenance is supplied as part of routine use of the landscape and through everyday processes needed to provide food, clothing, shelter and work. Individual actions are informed by shared cultural traits that influence the shape of the land as a collective home to the community.

Cultural landscapes are subject not only to entropy in their built components, but also to the forces of succession in their 'natural' components. Abandoned farms are found all over North America in marginal locations. In forested areas, 'old field' succession is recognized. On bare soil the first invaders are weeds. Native pioneering species with good powers of dispersal soon follow as soil conditions are ameliorated by vegetative growth and decay. Pioneering tree species prepare the way for an eventual takeover by climax tree species. In older settled areas of North America such as New England, where

farms began to be abandoned over 150 years ago, the only evidence of human inhabitation in an apparently natural forest may be crumbling stone walls and a hollow where a house used to stand.

In Manitoba's Interlake region where many pioneer farms were located on marginal lands, large areas of abandoned farmland have reverted to forest or rough pasture. Many once busy farms have left no trace in the landscape. To avoid the same fate for Hecla's cultural landscape a maintenance plan based on careful analysis of the cultural landscape must be devised. A considerable body of knowledge has been built up within the cultural resource management community regarding the preservation of artifacts, especially historic buildings. Less is known about the preservation of cultural landscapes, so information must be sought in many related areas.

4.0: iii Precedents

Hecla's cultural landscape exists in an unusual situation. It is an abandoned agricultural landscape within the boundary of a natural park. In Europe, preservation of cultural landscapes in marginal farming areas usually emphasizes incentives and subsidies, to stay on the land and to maintain traditional practices that shape the landscape. The situation that prevails in England's National Parks allows little control of farming practices and conversion of semi-natural landscapes to more intensive agriculture is proceeding (MacEwen & MacEwen 1982).

Some of the most popular historic landscapes, including Colonial Williamsburg and the Fortress of Louisbourg, are 'costumed landscapes'. The drama of history and the day to day lives of historic inhabitants are dramatized by costumed interpreters. This is a very expensive option involving the reconstruction of the complete fabric of a community. It is also vulnerable to a romanticization of history with messier aspects of life omitted, including farming, fishing and other activities that supported the settlement.

On the Canadian Prairies, the preservation of rural cultural landscapes is at an early stage. A number of individual homesteads have been preserved, for example the

Motherwell Homestead in Saskatchewan. There are numerous 'pioneer villages' that collect historic structures in an outdoor museum setting, but in this artificial setting the sense of the relationship to the land is lost or diluted. The characteristic cultural landscapes of major ethnic and group settlements on the Prairies have been studied with the intention of preserving representative samples (Dick 1987).

Perhaps the best precedent for the preservation of a rural cultural landscape within the context of a natural park is Cades Cove in Great Smoky Mountains National Park. When the park was established in 1934 a community of six to seven hundred people lived within the park boundaries at Cades Cove. Land was purchased or expropriated from inhabitants with provision for lifetime leases to those who wanted to stay. Wilson (1992) indicates that, "The feeling at the time was that once the old homesteads were abandoned, they would be razed and the park returned to its original state." However, "By the 1960's, park administrators realized that the cultural heritage of the park was as interesting as its natural heritage." They left what buildings were still standing in the valley and brought in others that were scattered around the park, all with the aim of representing a nineteenth century mountain community.

The landscape of the valley recalls its historic role as an agricultural oasis in the midst of forested mountains. "The centre of the basin is still used as pasture and cropland by farmers who live outside the park. ... (With) steep mountains enclosing an inviting, peaceful valley of haystacks and grazing horses and cows." (Wilson 1992) Interpretation of the landscape does not rely on costumed interpreters or historic artifacts. The pattern of the landscape, views of agricultural activities and presence of historic structures are enough to give a strong sense of a vanished way of life.

4.0: iv Options

Options suggested by these examples include: **1)** reoccupying the land with small scale farmers or fishers, **2)** contracting with local farmers to mow the fields and graze animals on the land, and **3)** using park maintenance staff to cut hay fields according to a

maintenance schedule designed to preserve the landscape and biodiversity of the fields. A further option which will not be considered in this study is the 'living museum.' This costumed re-enactment of period life demands a substantial investment of money and resources by government or private organizations that is probably not feasible. The period reconstruction used in 'living museums' does not create a true cultural landscape because it has no opportunity to evolve and does not respond to a living culture.

Option 1) is not practicable under present conditions. The trend to larger farm size in North America is based on underlying features of the farm economy and mechanization and cannot be dismissed. The amount of cleared land in the cultural landscape zone could only support 2 or 3 farms at the most. This would produce a very different cultural landscape than the small scale landscape produced under dense occupation.

Option 2), or grazing and hay making under contract or lease: This option has the advantage of giving animation to the cultural landscape. The landscape can be seen to have a purpose. Dynamic elements of the landscape such as grazing animals connect the observer with the processes that form the cultural landscape. Grazing adds a picturesque quality to the pastoral landscape. Also it is an important visual clue for interpretation of a landscape that originated due to the demand for grassy forage. Grazing also assumes a cultural importance by connecting the observer with subsistence strategies of the islanders. Appropriate interpretation strategies can relate the importance of stock raising in the culture of the Icelanders who came to settle on Hecla Island, and how they used the products of their animals in their diet and material culture.

Hay making and storage have important impacts on the visual quality of the cultural landscape. Haystacks were an important element of the landscape especially in winter. The harvesting regime of a hay field tends to produce a floristically distinct, and attractive meadow.

Environmental impact of grazing can be kept to a low level by restricting stocking rates and keeping animals away from the lake shore and soft, wet, easily-compacted

ground. Cropping by domestic animals will change the species composition through competition, however major likely impact is the danger of introduction of weeds if cattle are fed from an external source of hay. Therefore, introduction of grazing should proceed only during the summer grazing season or with supplementary feeding only with hay from a limited hay harvest on the island. Response of vegetation to grazing pressure and hay mowing will enhance the diversity of the meadows as some portions remain undisturbed and reduced competition from dominant grasses allows other plants space to grow. Mowing of the hay fields should occur after most wildflowers have had a chance to bloom and ducklings are no longer tied to the nest. Intensive management including practices such as cultivation, seeding of introduced forage grasses, and use of artificial fertilizers should not be allowed because of excessive changes in vegetation composition that would result. Any reintroduction of farming practices should monitor environmental impacts through studies of the flora of meadows.

Option 3) is essentially a more structured scheme for delivery of existing management practices. A maintenance schedule designed to enhance visual elements of the landscape and biodiversity of the semi-natural vegetation would be followed. In addition to cutting of hay and turf grass, there should be greater emphasis on the maintenance of houseyard vegetation. Resources available for the preservation of structures should reflect a greater concern for integrity of the cultural landscape, not just the individual importance of a structure as a historic building.

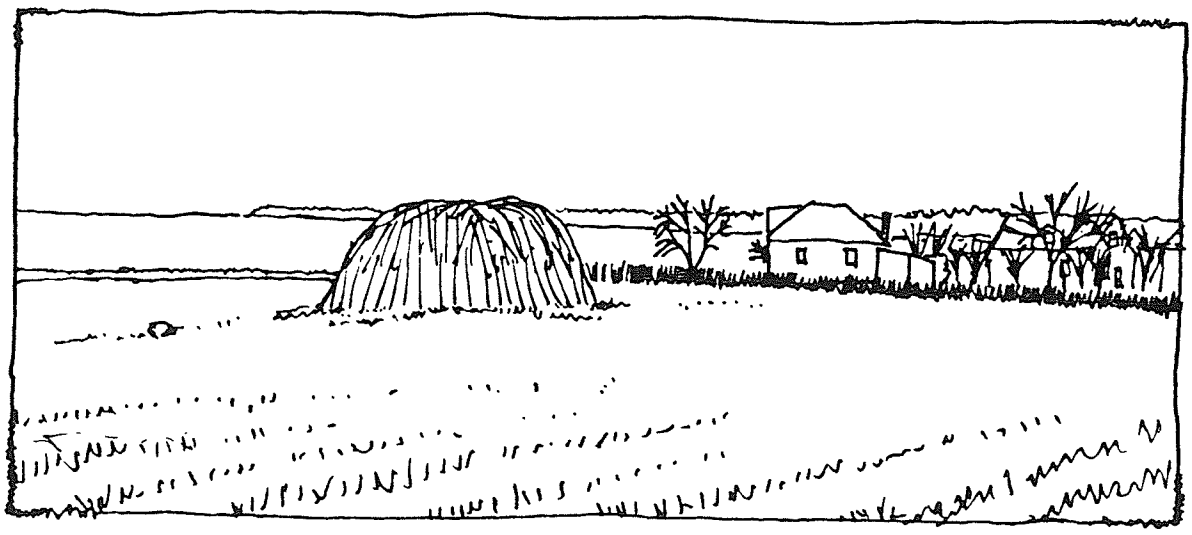


Figure 21: Fall 1993: A haystack in the meadow near the intersection of the highway and shore road indicates the visual impact of maintenance practices.

An integration of the three options together with re-inhabitation of the landscape will best fulfill the goals set out for the cultural landscape.

4.0: v Issues to be addressed in the management plan

Recommended management practices should produce a cultural landscape that will be sustainable over the short and medium terms. In the long term, a new generation will need to study its priorities and the place of Hecla's cultural landscape in the world another twenty-five years in the future.

The following issues are important to the integrity of the cultural landscape and will be addressed in the management plan :

1) Management of the semi-natural vegetation and designed vegetation of the cultural landscape,

2) Inhabitation and use of the landscape as a management tool in the cultural landscape and its appropriateness within a provincial park,

3) Issues of aesthetic integrity and visual legibility of the cultural landscape, and

4) The role of the cultural landscape in interpreting the cultural and historic story of the settlement.

4.1 Goals

The goals set out below, are based on the objectives of the practicum as stated in the introduction, research on the concept of cultural landscape and on ideas that emerged in response to discussions with interested parties concerned with the cultural landscape of Hecla Island. They are used to establish priorities for decision-making regarding the management of the cultural landscape.

1. To revitalize the relict cultural landscape as a living, dynamically evolving cultural landscape.

2. To restore the essential characteristics of the cultural landscape where possible and desirable in the new cultural landscape.

3. To improve the legibility and readability of the cultural landscape, for both the casual sightseer and the informed viewer.

4. To restore some of the functional relationships that shaped the cultural landscape.

5. To prevent further degradation of the cultural landscape due to the effects of time and neglect.

6. To strengthen the role of the cultural landscape in interpretation of the cultural, historical and environmental stories of the park.

7. To provide a gathering place for the community that has its roots in the Icelandic settlement on Hecla Island.

4.1: i Guiding principles for management decision making

Research on the management of cultural landscapes revealed several guiding principles that apply in the case of the Hecla settlement. The following principles were distilled from sources gathered from many different fields including: range management, prairie restoration, landscape ecology of semi-natural vegetation, cultural resources management, etc. (Anderson & Bailey 1980, Bradshaw et al. 1986, Dick 1987, Emery

1986, Feltwell 1992, Haber 1990, Higuchi 1983, Jakle 1987, Ledohowski 1988, Mackintosh 1992, Naveh & Lieberman 1984, Trottier 1992).

A) Apply ecological principles of succession, nutrient cycling, and disturbance in the context of a cultural landscape with a semi-natural vegetation to form the basis for a sustainable landscape.

A 1 Adapt traditional practices to 'maintain' the cultural landscape. Maintenance in this case does not mean to maintain the landscape in a static state, but to maintain the dynamic processes of landscape change which form the cultural landscape.

A 2 Adopt a disturbance regime that will sustain dynamically evolving patches, thereby enhancing landscape diversity and biodiversity.

A 3 Time management activities such as mowing to favour wildlife. Haying should occur after nesting waterfowl have left the nest (July 15: Ducks Unlimited, personal communication), and after most wildflowers have a chance to set seed.

A 4 Management will be aimed at reducing soil fertility, thereby favouring grassy and herbaceous vegetation at the expense of woody vegetation. Prescribed burning, mowing, or a combination should be used to reduce soil fertility. Prescribed burns can liberate and destroy nutrients in organic surface litter, short-circuiting the buildup of soil fertility that favours woody vegetation. Annual mowing removes nutrients and organic matter as hay is removed from the site.

B) Preserve the visual character of the cultural landscape.

B 1 Prevent encroachment of woody vegetation into the open landscape of the settlement. Management tools may include mowing, hay harvest, grazing and prescribed burning.

B 2 Preserve shoreline road as a low speed, winding, narrow road. Paving is not precluded, but should not be constructed to a highway standard, i.e. raised roadbed, wide lanes and shoulders, and smoothed curves. If practicable, the road in zone 8 should be restored.

B 3 Avoid further loss of houses and outbuildings to prevent a 'lost tooth' syndrome spreading as gaps multiply in the built fabric.

B 4 Restore evidence of agriculture and fishing to the landscape. Both the traditional haystack and modern round bale are acceptable because of the strong presence in the landscape they bring to hay making. Fishing equipment stored in the open animates the landscape.

B 5 Introduce fencing to control the movements of grazing livestock or as part of a reconstructed farmstead. Fences break the landscape up into small units along the shore. Growth of high grass, shrubs and trees along the fencerow should be restricted to keep the landscape open. Additionally, fencing along farm boundaries may hinder management activities such as hay mowing and prescribed burns.

C) The cultural landscape is an important part of the interpretation of the story of Hecla Island. Changes in the cultural landscape should aid in the telling of Hecla's story.

C 1 A cultural landscape may be restored by reintroducing the processes that shaped it, creating a new cultural landscape that incorporates historic elements in a related context.

C 2 Traditional agricultural techniques could be practiced on a small scale as an interpretive tool, illustrating the relationship of the people to the land and how people lived and worked in the landscape.

C 3 Reintroduction of grazing should restore meaning to the landscape by providing a clue to the interpretation of the landscape. Additionally, it is an opportunity to explain the importance of the pastoral economy to the Icelandic settlers.

C 4 The small scale fishing industry carried out from each dwelling should be made visible in the landscape. Fishing equipment such as boats, nets, buoys and reels for drying nets could be displayed by several dwellings.

4.2 Management recommendations for major landscape features

Major land-uses, elements in the landscape, and proposed design features, are discussed in greater detail in this section. The features discussed in this section include:

4.2: i Meadows
4.2: ii Survey and field patterns
4.2: iii Architectural elements
4.2: iv Visual and scenic qualities: Pastoral images
Nature
Wild
Country
4.2: v Lakeshore access
4.2: vi Trails
4.2: vii Landscape Zones

4.2: i Meadows

The dominant land cover in the study area is meadow. The flowering meadow with broad patches of colour is one of the archetypes by which the landscape is understood. This artifact of man's use of forested land for the production of hay was used as a metaphor for the first encounters by northwestern Europeans with natural landscapes dominated by grasses and low flowering herbs. We speak of alpine meadows and the Prairies (from the French for meadow). According to Feltwell (1992), "Modern man feels an affinity with meadows, their flower freedom, the random arrangement of grasses and the profusion of colourful flowers."

Meadow management can be used to enhance the characteristics of the meadows in the cultural landscape, particularly by increasing flowering, reducing the numbers of coarse, weedy plants and enhancing wildlife value.

Goals:

1) To encourage colourful wildflowers and meadow flowers.
2) To encourage diversity by using several management practices for different meadow patches, and avoiding management practices that would decrease species diversity.
3) To provide habitat for wildlife.

Means:

a) Each parcel of land should receive a consistent management regime to encourage the succession of plant communities adapted to that regime.

b) Organic matter with accompanying nutrients should be removed to prevent buildup of soil fertility with subsequent invasion by aggressive nutrient demanding plants and drop in diversity.

c) Industrial fertilizers should not be applied to the land due to the profound effect they have on traditional plant communities.

d) Pesticides should not be used because of the location within the natural communities of the park and the potential effect on traditional plant and animal communities.

e) Pastures and meadows should not be seeded with improved forage grasses or legumes. Only traditional species growing there today or known from documentary evidence should be seeded, if necessary to revegetate a site.

Ecological management of vegetation

Research on the semi-natural landscapes of northern Europe has revealed that open landscapes valued as amenity areas, are dependent on lowered fertility associated with traditional agricultural practices. With the decline in traditional agriculture, these open landscapes are subject to conditions which favour increased fertility, and an accompanying domination by a few coarse, competitive species and succession to semi-natural woodland. Maintenance of these landscapes as open amenity landscapes is dependent of lowering fertility. (Emanuelsson & Bergendorff 1986., Green 1986)

Controlled burning is often used to substitute for traditional, labour intensive methods of landscape management. It introduces a cycle of disturbance and release of nutrients that arrests succession and creates a mosaic of habitats (Green 1986). Reduction of nutrients will ease problems of succession to weedy and woody species that are changing the character of the landscape.

In North America, the open landscape of the prairies was maintained by burning, either natural or anthropogenic. Burning has also been a common tool in the management of grazing areas for livestock (Pyne 1982). This most important tool of

landscape management, will have an important role in maintaining the open landscape of the cultural landscape.

An annual cycle of burning in the spring or fall would offer the most advantages. Early spring burns are easiest to control because the ground and forest are still wet. The blackened surface will produce a flush of new growth before the main tourist season. Short cycle burning reduces the amount of litter that builds up, favouring low intensity fire. The dark burned over surface heats up quickly in the spring, warming soil temperatures and favouring species adapted to warmer, drier conditions (Anderson & Bailey 1980). Burning would therefore favour warm season grassland species from the adjacent aspen/oak parkland vegetation region. By contrast, hay cutting using the traditional cutting schedule will favour both cool and warm season grasses, allowing introduced species, that evolved in Europe to fill the niche provided by human managed meadows, to thrive.

Potential problems also have to be considered in planning a prescribed burning management cycle. There are a number of wooden structures scattered in the meadow areas that would need to protected in a prescribed burn restricting the areas suitable.

4.2: ii Survey and field patterns

Fencing of boundaries, or delineation of fields though different management techniques, will strengthen the visual characteristics of the landscape and increase the legibility of the survey system and its evolution.

A discontinuous fence line along the shore road will act as a separation between the public space of the road right-of-way and the inhabited space of the landscape. By claiming space, the fenced field denotes human occupation on the land. In the existing situation there are few or no clues that indicate the origin of the meadows as a managed ecosystem, and not a natural feature. Additionally by providing a boundary between houseyards and open fields, fences will create spatial definition of the private domain.

The strict geometry of the survey grid oriented to the cardinal directions meets the irregular shore of Lake Winnipeg in the settlement. The east-west orientation of the survey lines is displayed by field boundaries that are fenced or between areas of contrasting vegetation management. The shore road and houseyards respond to the curvilinear geometry of the lakeshore. By providing a stable reference, east-west fence lines increase awareness of the changing orientation of the lakeshore. Orientation of houseyards to the lakeshore can also be better appreciated when contrasted with the constant reference of field patterns.

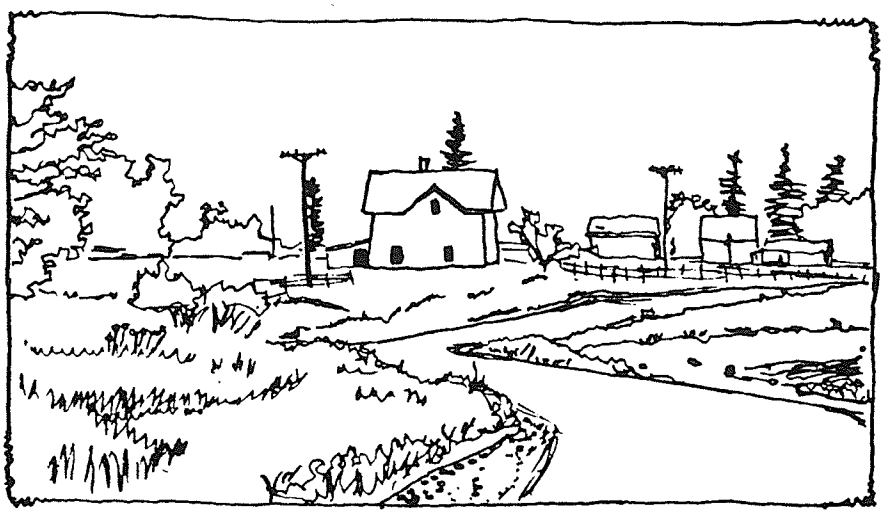


Figure 22: Farmsteads closely spaced along the shore road.

Field boundaries at intervals of 400 m (one quarter mile) or less, reinforce the linear character of the landscape experienced by a traveler along the shore road. The loss of houses and their associated outbuildings has created large gaps in the linear settlement pattern. The rhythmic element of fence lines bridges gaps, creating a linear sequence of elements. Reintroduced field divisions will reduce the scale of the landscape. The close spacing of elements contrasts with the prairie landscape where field divisions commonly occur at 800 m (half mile) or even, 1.6 km (one mile) intervals. This small scale, rural landscape of meadows and pastures evolved under the influence of a preindustrial agriculture profoundly different from the capital and technology intensive agriculture that shapes our rural landscape today.

Fence Materials: Barbed wire and wooden fence posts have been the most effective fencing material on the island through most of its settlement history. Barbed wire fences are not a visual barrier, they divide land without concealment. This visual openness allows the open landscape to flow through, preserving the contrast between the open fields and the closed forest.

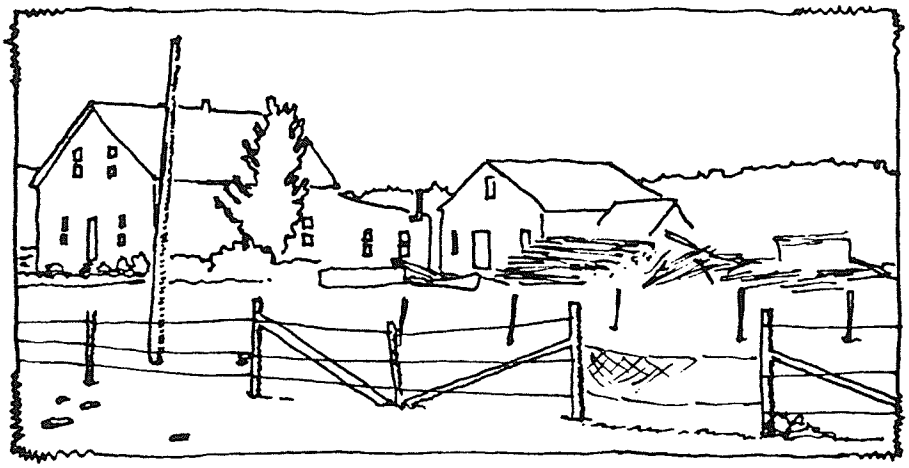


Figure 23: Three strand barbed wire fences separating pasture from farmyard.

4.2: iii Architectural elements

The vernacular architecture of the island produced a harmonious suite of buildings much of which still stands. Any new building should respect the existing heritage when considering massing, materials, size and form. The collection of historic buildings in the Hecla settlement contributes to the sense of unity in the landscape. Similar forms, volumes, shapes, colours and details in the buildings in the landscape produce harmony and help to tie the linear landscape together.

In the group settlements characteristic of Manitoba's settlement history, building traditions brought over from the old country or that evolved during the history of the settlement, flourished and formed a distinctive part of the landscape associated with each group (Ledohowski 1988). Icelandic immigrants were one of Manitoba's largest and oldest pioneer groups and evolved a distinctive building tradition (Dowsett 1984). Hecla

Island was somewhat isolated from the larger Icelandic settlement and several distinctive traits may be seen in the surviving historic structures. Hipped roofed houses are much more common on Hecla and an interesting hybrid is also seen. Several houses have hipped roofs facing the northwest wind and are gabled on the opposite side facing the lake.

Figure 24: Pre World War I house at Brekka. 1 1/2 story hipped roof frame house with attached shed at back.

Design Guidelines: Detailed specification of architectural guidelines is outside the scope of this study. However, several basic principles are evident.

- Construction should respect forms, volumes, shapes, and materials found in historic structures but new construction should not pretend to be authentic historic building.
- Obviously anachronistic styles should be avoided.
- Houses should respect existing colour scheme of white or yellow with contrasting dark trim. Outbuildings were usually painted red or gray, or left unpainted and weathered to a grey.

4.2: iv Visual and scenic qualities

Pastoral images

Pastoral images can be strengthened by managing the meadows for broad patches of bright wildflowers and meadow flowers. Picturesque elements of the pastoral scene such as haystacks, grazing sheep and cattle, fences and neatly kept house and farmyards, will contribute to the sense of the landscape as an active, working system. Strengthening the pastoral characteristics of the landscape will aid in interpreting the pastoral nature of a community dependent on sheep, cattle and horses for subsistence.

Nature

Appreciation for the attractions of nature can be enhanced by informing the visitor about the notable plant and animal species that may be encountered in the cultural landscape and by enhancing the habitat for these and other species, thereby increasing the

numbers and visibility of wildlife. There is an opportunity for more intimate contact with wildflowers and other vegetation of meadows and forests, through nature walks and an interpretive pamphlet. Meadow management should also encourage the spread of wildflowers. Habitat of birds, the most visible members of the fauna should be enhanced. Meadows can provide habitat for upland nesting waterfowl. Large shoreline trees should be retained for roosting bald eagles and osprey.

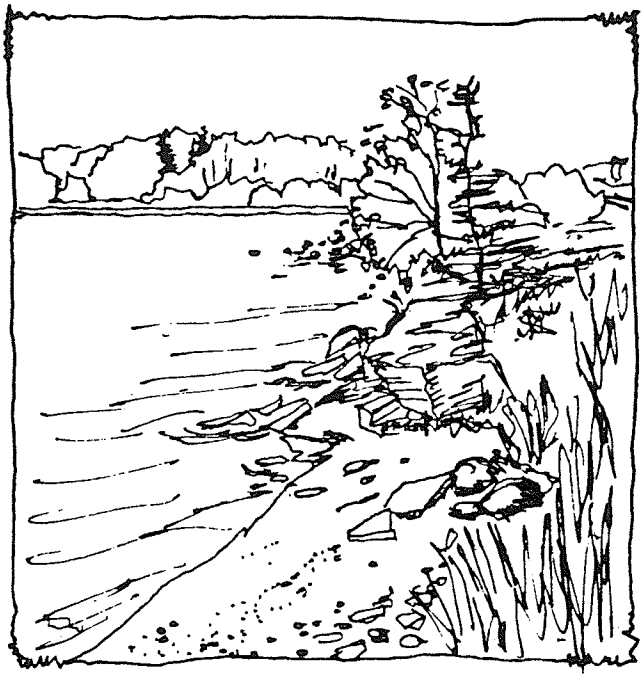


Figure 25: Periodic low rugged limestone cliffs interrupt the shoreline, enhancing the wild character of the landscape.

Wild

Appeal of the wild landscape rests on the lake, shoreline cliffs and forests. This appeal is threatened if the landscape is too manicured in appearance. Where grass is mowed to a lawn height right to the cliff edge, the wild character of the cliff is reduced. Where neat roadside verges are desired (excluding areas such as the village, dwellings and high pedestrian traffic areas) mowing to a height of 10 to 20 cm (4 to 8 inches) is adequate and will allow a more diverse and colourful vegetation.

Country

The settled, fertile nature of an inhabited landscape, well cared-for and productive, is the basis of the attraction of the country. Modern industrial scale agriculture loses much of this attraction by depopulating the rural landscape and creating a landscape of huge fields unrelieved by the evidence of human care. Hecla's cultural landscape should appear to be in productive use and be composed of fields on a scale small enough to

provide evidence of human care. Well tended dwellings and gardens are evidence of human care for the landscape and inhabitation of the historic dwellings should be encouraged with appropriate measures to ensure maintenance.

4.2: v Lakeshore access

Design and management decisions regarding the lakeshore and its relationship to the land should seek to strengthen the tie between land and water. The present landscape has a lack of access to the lake. There is no comfortable way to stop one's car and venture down to the water. With points of pause (Jakle 1987) along the shore road, sightseers will have a refuge from the road where they can stop, rest and enjoy a scenic view and access to the water. Points of pause along the shore road will allow opportunity for panoramic views and absorption of impressions of the landscape from a rounded full sensual perspective, rather than the purely visual experience of serial vision from a moving vehicle. Closer access to the cliff edge will allow greater appreciation of their height and ruggedness, the vertical extent of which is hidden until the drop-off is approached.

4.2: vi Trails

A proposed system of trails will broaden access to the landscape. Landscape experience at a scale and pace more in keeping with the original occupants experience of place can occur on trails for walking, biking and horseback riding. A trail system will also allow access to the landscape away from the linear corridor of the shore road to which most visitors presently restrict their activities. The opportunity to travel from forest edge to lakeshore, will allow more complete experience of landscape. Interpretive opportunities along the trail system will allow sightseers to explore the use made by the former inhabitants of different zones in the landscape.

Routing

Proposed trails will connect the village centre, with its existing interpretive trail, to at least one of the proposed points of pause along the shore road. A connecting route between two end points will allow the sightseer to experience most aspects of the cultural landscape; including hay meadows with wildflowers, grasses, and haystacks or hay bales; pastures with their short turf, fences and livestock; historic structures as ruins, stabilized structures or as inhabited dwellings; the forest varying from the forest edge to secondary growth to mature trees, and the shore with its natural variation and cultural features used to gain access to the water.

Routing Issues Addressed

1) Views along a route structured to provide prospect and refuge

2) Opportunity to stop, explore, and choose paths along the journey, creating involvement in the journey.

3) Create a loop or return path that allows access from the shore all the way back to the forest.

4) Create a route that allows experience of edge environments with elements of spatial enclosure, rich visual density, and of wide open grassland landscape.

5) Route should respect the privacy of inhabited dwellings.

6) Route should take into account the compatibility of trail users with grazing livestock. Many people will not feel comfortable venturing across a pasture with grazing cattle or horses.

7) Easements will be necessary where the trail route crosses private lands.

4.2: vii Landscape Zones

Management of the visual character of the cultural landscape should build on the pattern of rhythmic views. Analysis of the landscape reveals a series of zones which may serve as the basis for the design of the landscape. Contrasting and complementary treatments of landscape elements in the zones strengthens the visual patterns inherent in the cultural landscape. For example the close rhythm produced by fenced pastures in one

zone will alternate with open meadows in the next zone. Contrast between the zones at the local level will be subsumed in a larger scale unity of the landscape as particular patterns are encountered at intervals in the journey, establishing a larger scale rhythm.

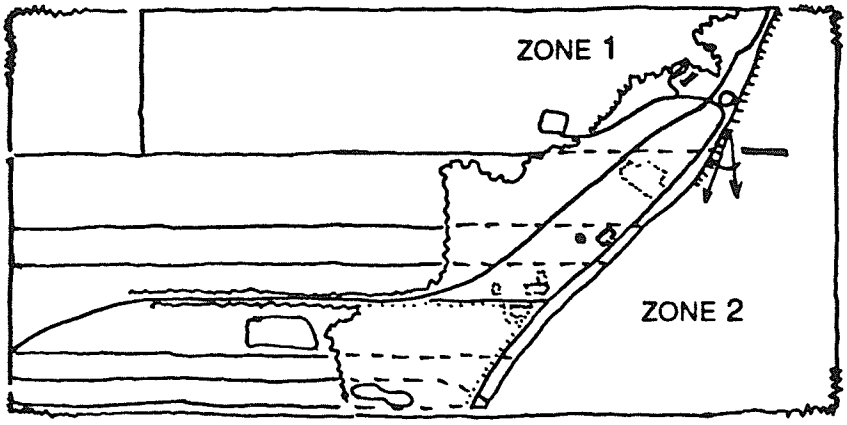


Figure 26: Landscape zones 1& 2.

The design goals and guidelines set out above will have different affects and different contexts in each of the landscape zones. The landscape zones will therefore be the basic unit at which design decisions are made.

Zone 1: This is the main entrance to the cultural landscape and the main design challenge is to indicate the importance of the intersection as a gateway. The open grassy land on top of the cliffs provides a good view of the village to the south.

Zone 2: As the traveler passes by on the highway, the essential elements of the cultural landscape should be clearly legible. Hay fields and fenced pastures will indicate the narrow lots of the settlement pattern. Traditional agriculture will be visible in pastures south of the highway, with access to a pond for livestock watering.

Zone 3: The village: Little change is foreseen regarding management of the cultural landscape in the village. The village will continue to be a centre for services, visitor interpretation, and cultural gatherings.

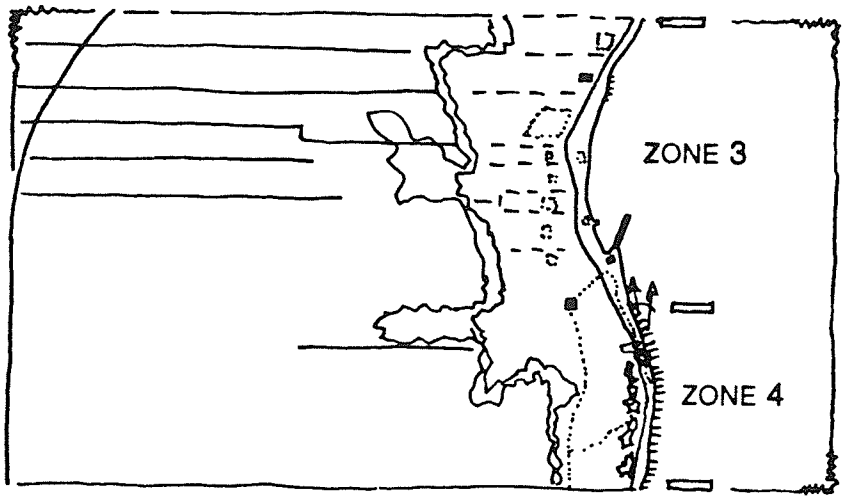


Figure 27: Landscape zones 3 & 4.

Zone 4: The cliff-top: The open landscape should be managed as a hay meadow. The mown verge along the road should be cut to 10 to 15 cm (4 to 6 in) rather than 6 cm (2 1/2 in), as at present. A roadside point-of-pause will serve as a cliff-top vista toward the village and as a link in an interpretive trail loop from the village. The trail will interpret the natural and semi-natural vegetation and its relation to hay cutting and the geology and geomorphology that formed the cliff. No development such as infill building is foreseen in this zone.

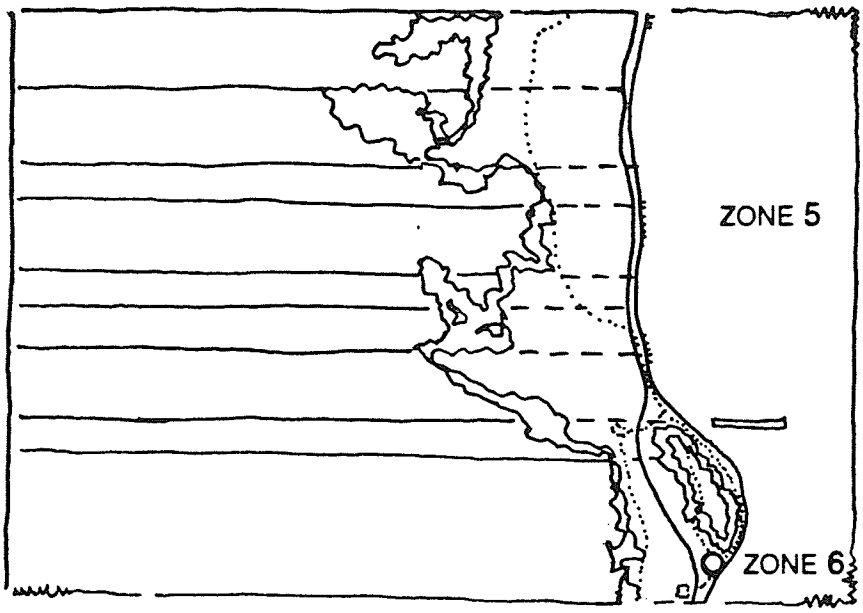


Figure 28: Landscape zones **5** & **6**.

Zone 5: This zone has the potential for the cultural landscape to be reoccupied and all the essential visual and spatial patterns restored. The first priority is to restore endangered dwellings. Private initiative can be involved using restoration leases. Infill is desired in this zone to fill in gaps in the settlement pattern. Construction should occur near, not on, original sites to preserve archaeological resources. The meadows should be managed for hay, while respecting original lot boundaries.

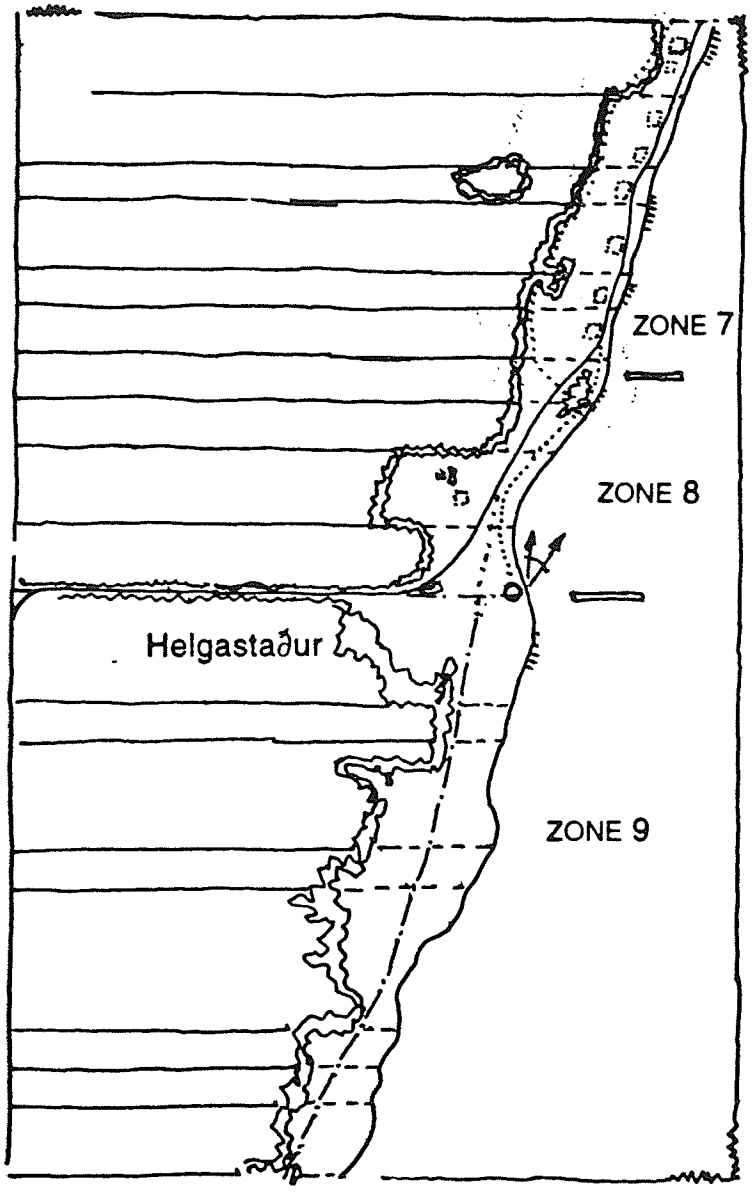
A trail provides an alternative experience of the landscape to the sightseer. It connects earlier segments to the north and south. A mown strip through taller grass will provide adequate marking for the trail.

Zone 6: The land on the point was never subdivided to the extent found in most of the study area. There has always been a thinning in the intensity of development. The landscape should be maintained as a thin open strip compressed between the forest and the bush on the point.

An excellent opportunity exists for a roadside turnout to serve as a trailhead interpreting the old shore road, the forest and succession from old field to forest. Later this trail could be connected to the proposed hiking trail along the length of the cultural landscape.

Zone 7: This zone is very similar to zone 5 and many of the same comments apply. Several houses in this zone are inhabited. Restoration leases and cottage leases can be used to reoccupy the land.

Zone 8: Relocation of the road has affected the integrity of the cultural landscape in this zone. A trail could follow the former course of the road in this zone, terminating at a lake access point at the end of the section line road. Relocation of the road to line up with the road south of the section line will reinforce the sense of entering a linear settlement as the motorist faces a stop and choice of turns at the intersection.



Zone 9: This zone will remain off the 'beaten track' and no major changes are foreseen. Helgastaður, located immediately south of the section line road, would be a good location for traditional grazing and cattle raising.

Figure 29: Landscape zones **7**, **8**, & **9**.

4.3 Implementation Strategies

Agriculture: A range of management tools may be used to implement agricultural practices in the cultural landscape. Farm land may be leased to an operator for grazing or forage harvest with provision in the lease for control of farm operations to coincide with design and management goals. Haying rights to a parcel of land may be leased with access restricted to a specified time for the hay harvest. Park management may alternatively contract with an operator to custom harvest hay, which may be used or sold.

Cottage or dwelling leases: Existing dwellings could be leased to cottagers, in which case provision must be made in the lease for the responsibility of the lessee to maintain or restore the dwelling. If provision is made for the lease of land for the erection of new cottages or dwellings, the terms of the lease must be clear to ensure the construction adheres to the basic visual and spatial patterns of the cultural landscape. architectural guidelines would have to be created to govern character and form of construction.

Conservation easements on private lands: Where necessary features of the design, such as an interpretive trail, must use private land, a conservation easement to allow the use of the land will have to be negotiated. Conservation easements have also been used to control development and set aside land for conservation purposes. This will probably not be necessary because planning authority for the park rests with the Parks Branch.

Architectural guidelines: A set of architectural guidelines should be prepared with the input of an architectural historian. The guidelines for the restoration of existing structures should be quite strict with regard to accuracy of exterior appearance. New structures should respect traditional architectural styles without slavish imitation.

Cooperation with volunteer organizations: Active volunteer organizations exist in the community of former Hecla residents. Their contributions have been very valuable in

the restoration efforts in Hecla village. This practicum could serve as the basis for discussions with the group of former residents who are seeking return of lands or access to land for cottages or second residences.

Maintenance schedules: It is recommended that each plot of land in the cultural landscape study area be mapped and a specific maintenance schedule be put in place for each. Three different types of land may be found in a plot: **1)** meadows or pastures, **2)** houseyards, & **3)** forest or bush.

1) Meadows may receive one of four treatments.

i) Spring flowering followed by short frequency (2 weeks to a month) cutting.
ii) One mid-summer cut (after July 15) which is the traditional hay harvest.
iii) A late summer cut which allows later flowering plants to reproduce.
iv) A mown verge which is kept at a height of 100 to 200 mm (4 to 8 in).

2) Routine maintenance of houseyard vegetation should include pruning of shrubs and trees on a yearly basis and replacement planting of trees lost to age, storm damage or disease.

3) Major encroachment of forest edge into former fields should be held or reversed with a program of bush clearance and controlled burns or regular mowing.

Government initiatives: In today's fiscal climate of restraint, governments are hesitant to commit new money. Government money can have greatest impact by leveraging private investment and by providing the necessary framework of research and planning. An example where government money may provide the leverage needed for the re-establishment of the cultural landscape is the provision of loan guarantees for mortgages needed to finance the restoration of buildings on leased land in a provincial park where banks would hesitate to lend. Funding for further research is needed on architectural history and ecological systems. Any major development in the cultural landscape should be evaluated for impact on the environment.

Section 5: Discussion

Although the circumstances leading to the preservation of the cultural landscape on Hecla Island are unique, in many other aspects it is a typical cultural landscape. The methods applied in the study and analysis of the cultural landscape are widely applicable. The basis of the method lies in the nature of cultural landscapes as a product of the co-evolution of culture and the landscape. Examining the factors in the co-evolutionary process is necessary to an understanding of the cultural landscape and in preserving the dynamic interrelations that form the heart of the landscape.

5.1 The need for management of cultural landscapes

Continued rapid change in land-use with sprawling suburbanization, growing exurban development and continued loss of traditional agricultural systems is resulting in rapid replacement of traditional cultural landscapes with radically different cultural landscapes. Although change is always a part of cultural landscapes, the amount and rate and nature of the change is sometimes greater than is desired or necessary. Roberts (1994) suggests "that the secret of managing such landscapes has something to do with allowing change to proceed at a pace which does not disrupt or undermine the wellbeing of local communities." Where the cultural landscape is particularly valued and the virtues of government regulation of development for the good of society are recognized, attempts have been made to preserve the landscape or to regulate the nature and amount of development.

These attempts usually do not specifically recognize cultural landscape as the object of the policy. Landscapes may be preserved for their historic value, natural or scenic value as in the National Parks of England and Wales, as a defensive mechanism to control urban sprawl as in green belts, and for their aesthetic value as found in designed landscapes. Although the intent in these policies may be to preserve valued cultural landscapes, it is rarely stated or promoted in these terms.

The rate of cultural change in contemporary society is rapid and old agricultural, settlement and economic systems are giving way to new. But this does not have to mean the wholesale destruction of our cultural landscapes. Where cultural landscapes are valued and their essential characteristics understood, a new integration is possible in the cultural landscape that recognizes new uses, while incorporating old processes and patterns. Where development is to occur it may be accommodated within the patterns of the landscape rather than obliterating previous patterns and processes.

In North America, the term 'cultural landscape' has not entered popular usage outside a few academic subdisciplines. In the absence of a conception of cultural landscapes as a subject worthy of concern, study, and preservation those few cultural landscapes that have been studied with the aim of preservation have been identified as heritage or historic landscapes. There are very different biases in these two views of landscape. A historic or heritage landscape is valuable because of its association with the past. A cultural landscape is valuable because it is a living, evolving landscape inhabited or used by people, ideally with a continuing tradition to the present. Natural, historic or scenic features are often integral to a cultural landscape, but are not a requirement.

5.2 Analyzing and managing a cultural landscape

In order to manage a cultural landscape it is necessary to know, not simply what it looked like, but also how it was used and what it meant to its inhabitants, and how it evolved to its present state. On one hand, is the history of the cultural group(s) inhabiting the landscape and their cultural adaptations to the landscape and to changing social and economic systems. On the other hand, are landscape processes both natural and anthropogenic, and the typology of the physical aspects of the landscape. The interface between these systems creates the patterns of land-use, vegetation response, and artifacts that are the essential characteristics of the specific cultural landscape.

By defining the essential characteristics of the landscape a framework can be created for managing the cultural landscape. The mechanism of formally stating the essential

characteristics of the landscape allows choices to be made regarding which characteristics are necessary, feasible and/or desirable to incorporate into a new landscape management plan.

It is ineffective to attempt to preserve only the form of the cultural landscape. Without cultural processes to shape the landscape it becomes an exercise in continual high maintenance for little return, or the character of the landscape will fundamentally shift leaving artifacts divorced from their context.

It is my hope that this study may play a small part in increasing awareness of the meaning and value of cultural landscapes and bringing about increased respect and understanding of our endangered cultural landscapes.

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