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Feeding in the forest: How Scottish settlers learned to raise livestock in the old-growth forests of Upper Canada, 1814 to 1850*

by Elizabeth Ritchie

Abstract

In the first half of the nineteenth century, Scots were among the many European immigrants who tried to turn North American forests into productive farms. They understood how livestock were integral to this project, providing draft power, meat, leather, wool, tallow, manure and income. However they had no experience of rearing and sustaining pigs, cattle and sheep in the old growth forest of Upper Canada. They brought some skills and knowledge from Scotland, but much was learned from neighbours, books and by experimentation. Emigrant guides, agricultural reports and personal letters indicate how exactly settlers utilized woodlands to feed and shelter animals in those first few years. As Scottish immigrants became more settled, they transformed much of the forest which had initially sustained them into arable and high quality pasture and meadow.

Between 1819 and the 1830s three Scottish emigrants, intent on becoming colonial farmers, encountered Upper Canada's forest for the first time. Andrew Bell was an urban Scot. On arrival in Perth County he was horror-struck: 'we thought the land would be covered with grass, and only a few trees here and there. But how great was our disappointment, when we found the ground was all covered with large trees, and not a pile of grass growing, except in beaver meadows'.¹ Robert MacDougall from Fortingall, Perthshire, settled in the Huron Tract. An experienced mixed farmer, he adapted to the forest explaining it 'is a good habitat for [cattle] in the summer, when the two-year-olds have calves; and though the winter snowstorms rage, if there are only a few of them, the cattle will not be terribly difficult to

* I am grateful to the British Academy-Leverhulme Small Research Grants scheme for enabling much of this research. Thanks are also due the anonymous peer reviewer, to Doug McCalla for his insightful questions; to Claire Gill for her agricultural expertise; to Alec and Janet Campbell, Eiden, for their practical tutorials on lambing and the lifecycle of sheep; and to Issie MacPhail for pointing me to the Assynt example and especially for the instructive conversations about the eating habits of cattle, wolf behaviour, and the importance of pigs.

¹ Andrew Bell, 17 May 1819, quoted in Robert Lamond, *A narrative of the rise and progress of emigration from the counties of Lanark and Renfrew to the new settlements in Upper Canada* (1821), p. 73.

maintain'.² The energetic Mr Johnson from Berwickshire forewent the slow boat up the St Lawrence, instead walking from Lachine with his dog. As he passed through Glengarry he saw what could be achieved after a few decades of backbreaking clearance: 'good grass with large flocks of black cattle'.³ Livestock were integral to farms. They provided draft power for work and transport, meat, leather, wool and tallow. They were a movable good, a source of income, a way to accumulate and pass on wealth, as well as a source of pride and identity. Manure, especially from cattle, was crucial in transferring nutrients from forests and meadows to arable land.⁴ Scots, like most European immigrants, came from urban backgrounds or well-established farming regions. In order to survive their first years in partially or uncleared lots, Scots, in common with other European migrants, had to learn how to raise livestock in the old growth forest of Upper Canada.

The forest has loomed in the minds of historians as well as immigrant farmers. Since the work of Harold Innis and Arthur Lower, the importance of the environment and natural resources in Canada's development has been recognized.⁵ While the staples thesis proposed by these economic historians posited that first fur, then timber and wheat exports were the essence of Upper Canada's economy, Douglas McCalla, David Wood and Béatrice Craig have shown it had a much broader base.⁶ Farms like Robert MacDougall's had many outputs, mostly for family consumption or the local market rather than export. Such family farms were only 'weakly integrated within the international economy'.⁷ Not only was arable used for much more than wheat, but the forest could produce much more than timber. Indeed the first crops on a new lot might be potash, wood fuel and charcoal.⁸ Neither was the second crop necessarily wheat, especially in the backwoods. It was more likely to be the produce of animals: dairy, calves, pork. The tactics of the earliest years have been overlooked in emigration literature and underplayed in Ontario's agricultural history.⁹ Developing mixed agriculture was the strategy of most new farmers, and this continued to be the case as farms matured. But before meadows and fields had been cut out of the forest, how were the cattle, pigs and sheep which were so vital to surviving and to developing a family agricultural business kept alive and pushed towards thriving? The resources of the forest itself were vital to raising the livestock that settlers required.

² Robert MacDougall, *Ceann-Iuil an fhir imrich or The emigrant's guide to North America* (1841) edited by Elizabeth Thompson (1998), p. 96.

³ Library and Archives Canada [hereafter LAC], R6243-0-3-E, MG24-I35, Journal of Mr. Johnson, 13 Sept. 1819.

⁴ Elizabeth Ritchie, 'Cows, sheep and Scots: Livestock and immigrant strategies in rural Upper Canada, 1814–1851', *Ontario History* 109 (2017), pp. 1–26.

⁵ For example, Harold Innis, *The fur trade in Canada: An introduction to Canadian economic history* (1930), and Arthur Lower, *The North American assault on the Canadian forest: a history of the lumber trade between Canada and the United States* (1938); *Great Britain's woodyard: British America and the timber trade, 1763–1867* (1973).

⁶ Douglas McCalla, *Planting the province: The economic history of Upper Canada, 1784–1870* (1993), pp. 6, 67, 77; J. David Wood, *Making Ontario: Agricultural colonization and landscape re-creation before the railway* (2000); Béatrice Craig, *Backwoods consumers and homespun capitalists: The rise of a market culture in eastern Canada* (2009).

⁷ R. Cole Harris (ed.), *Historical atlas of Canada, I, from the beginning to 1800* (1987), plate 68, 'Eastern Canada in 1800'.

⁸ Wood, *Making Ontario*, pp. 13, 109.

⁹ A notable exception in the American literature being Brian Donahue's study of English settlers in Massachusetts, *The great meadow: Farmers and the land in colonial Concord* (2004).

The farmers who harvested the forests and created the fields were the key figures in Upper Canada's colonization. Although there were many well-developed farms along the American border, the region's main story between the War of 1812 and mid-century was the assault on the forest. Wood has argued convincingly that settlers clearing trees to create an agricultural landscape were the main agents of change. Many were immigrants. By 1842, at least 50.4 per cent and perhaps as many as 55.9 per cent of Upper Canadian farmers were British and Irish migrants or the children of British and Irish migrants.¹⁰ The 1842 census indicates 8.6 per cent of residents were Scottish-born.¹¹ Whilst over half the population were Canadian-born, this group included many children of Scottish parents. Of the immigrant groups, the Scots were almost equal in number with the 8.8 per cent who were English-born, behind the 17 per cent Irish-born.¹² These were the people who extended the agricultural frontier north and west from the Johnstown district, from the west of Lake Ontario, and from the London district.¹³

This study focuses on Scots as representative of new settlers, in order to examine how immigrant farmers in Upper Canada developed the skills to raise livestock in the backwoods as part of the typical first-generation mixed farm. Analysing their strategy also reveals the agricultural methods of the mythic, but under-examined, pioneer phase of North American farming. We end in the middle of the century when immigration and population growth slowed, when most viable agricultural land in Upper Canada had been appropriated, and when the colony entered a period of economic transition.

Settlers brought with them a variety of previous experience and knowledge. Lowland Scots were often agricultural labourers or tenant farmers used to an undulating, fertile landscape of enclosed fields increasingly oriented towards specialization and commercialization. Although the economy was rapidly changing, most Highlanders were familiar with diversified production which aimed to provide a comfortable subsistence. Hills supported cattle and sheep, raised for consumption and cash, and valley bottoms provided grain, and latterly hay and root crops. Urban Scots usually had experience of keeping a milk cow and a garden, but knew little of ploughing or sowing crops. All were accustomed to a milder, wetter, windier climate than Upper Canada's hot, humid summers and cold, snowy winters. With the exception of some from places like Rothiemurchus, few had experience of extensive, mature woodlands.¹⁴ The first section of the article therefore examines how Scots fed their livestock at home to get a sense of what skills or knowledge they brought to their new location and what had to be learned from neighbours, from guide books, or by trial and error. It then uses emigrant guides, agricultural reports and personal letters to explore how settlers used the Upper Canadian forest to feed and

¹⁰ Donald Akenson calculated percentages which acknowledge the children of settlers and concluded that between 12.6% and 14.0% of Upper Canada's population should be classed as 'born in Scotland or born in Canada of Scottish parentage'. English and Welsh were between 12.9% and 14.3% and Irish between 24.9% and 27.6%. Donald Harman Akenson, *The Irish in Ontario: A study in rural history* (1984, 1999), pp. 17–20.

¹¹ *Censuses of Canada, 1667 to 1871: Statistics of Canada*, IV, (1876), p. 136. The total population was 487,053. However as 27,309 did not give a place of birth,

the percentage of Scots is calculated from the total of those who did declare: 459,744.

¹² Americans and 'Europeans' trailed behind with 7.1% and 1.4%, with French Canadians making up the final 3%.

¹³ McCalla, *Planting the province*, p. 37.

¹⁴ T. C. Smout, 'The history of Rothiemurchus woodlands', in T. C. Smout and R. A. Lambert (eds), *Rothiemurchus: Nature and people on a Highland estate, 1500–2000* (1999), pp. 65–73.

shelter animals in summer and in winter. It concludes by showing how over the first decade or so of settlement, immigrants focused their energy on developing more secure sources of animal feed and enhancing commercial grain production through transforming much of the forest which initially sustained them into arable and higher quality pasture and meadow. They remade the landscape in the model of the enclosed, improved arable farms of Lowland Britain.

I

The *Statistical Accounts* of Scotland detail the animal husbandry practices of the emigrant generations. The properties of the home landscape were carefully managed and adapted to raise cattle, horses, sheep, goats and pigs. It is this knowledge, experience and aspiration that many Scottish settlers brought to their forest plots.

William MacKenzie, who wrote the 1793 *Account* for Assynt in the north-west Highlands, had a detailed and sympathetic knowledge of local agriculture. While slightly earlier than the period of study, most Highland emigrants to Upper Canada in the early nineteenth century would have raised stock using similar methods, or would have been aware of them from childhood. MacKenzie's account predates the massive structural change from subsistence to commercialized sheep farming which subsequently swept the region. While there were local variations, practices in Assynt, one of the more topographically challenging Scottish parishes, show how people carefully managed resources to raise livestock. The hills provided pasture, especially for the yell cattle, which grazed in common for the three summer months.¹⁵ Lower down there were 'interjacent little glens, fields, plains and meadows, which, during summer and harvest, abound with rich pasture for milk cows, some goat and sheep'.¹⁶ From them hay was cut in August or September to keep the beasts through the winter. A sophisticated system of transhumance involved moving herds of specific types of cattle to new pastures every few weeks throughout the summer to prepare beasts for market or slaughter.¹⁷ The small islands just off the coast provided an easy way to control grazing. The carrying capacity of each was understood and the resources well stewarded. Cronay could fatten half a dozen sheep or one cow.¹⁸ Oldnay's pasture was used for milk cows through the summer. At harvest they were removed so the grass could recover before cattle were swum back across in November. There they were out-wintered until they were gradually taken off the island again 'to be housed ... as they may appear to need provender'.¹⁹ The main winter grazings were in the middle of the parish: 'a perfect wild, covered with heath, moss, heathery hills, and rocks of small size, and fresh water lochs'.²⁰ Milk cows were again given preferential treatment, on bad days being 'supported sparingly within doors'. By February most cattle were housed and fed.²¹ The only woodland in the parish was sparse and of no commercial value, but it was important. During 'great storms and falls of snow, every species of cattle resort to them for shelter; nay they

¹⁵ *Old Statistical Account* [hereafter OSA], 16, p. 168. 1750–1800 (2016), pp. 60–75.
Yell, yeld, eild were all terms used for a non-breeding animal.

¹⁶ *Ibid.*, p. 185.

¹⁷ David Taylor, *The wild black region: Badenoch,*

¹⁸ OSA, 16, p. 178.

¹⁹ *Ibid.*, p. 177.

²⁰ *Ibid.*, p. 165.

²¹ *Ibid.*, p. 164.

browse on the copse'.²² Although as many as half the calves were slaughtered in November to reduce the strain of winter feeding, many were in a terrible state by spring.²³ A Perthshire observer commented that in May cattle were 'reduced to a skeleton and covered with a blanket, while they picked up any spires of grass which had begun to rise in the kailyard'. As a last resort the people took 'half-rotten thatch from the roofs of their houses and [gave] it to the half-dead animal'.²⁴ Even in Lowland areas, where cattle were primarily raised for working the large new farms, feed could be sparse. On the fertile coast of Easter Ross, G. S. MacKenzie noted how six cattle were turned onto a weedy field to feed after they had ploughed it. He 'never observed that they got any other sort of food during the day, except a small quantity of oats just before they went to work. At night the horses and cattle were turned to some patches of waste ground to pick up a miserable pittance of grass'.²⁵ Keeping cattle sufficiently nourished to provide beef, milk or labour was a complex business, involving supplementary feed and shelter in the winter to prevent catastrophic loss of condition, and access to natural grazing, well away from growing crops, in summer. Despite the negativity of observers, the system, which was common in lowland Britain and New England until overly stretched by population pressures, succeeded in raising a large number of livestock and supporting the population by balancing the diverse components of a difficult environment.²⁶

While cattle were the mainstay, many Scottish farmers also brought experience of raising horses, sheep and pigs for home use and for sale. By the 1830s most horses were bred for farm work and were fed hay, oats and grass year round.²⁷ Some small, sturdy garrons, which had no such careful feeding regime and grazed in common on the outfield, were still used in northern Scotland.²⁸ Smaller, less expensive animals were easier to raise. By the early nineteenth century the Scottish prejudice against pigs had receded.²⁹ Across the south, and increasingly in the north, families bought one or two at the end of the harvest for home use. These were often permitted to 'roam at large' with other animals, but they tended to damage grass and corn lands badly.³⁰ They were easy to feed on the dairy by-products that every rural family had at hand. Their winter staple was potatoes with additions of oatmeal and kitchen offal. Pigs provided the only meat in the diet of the poor. Pork was 'a good morsel at the end of March and affords a mouthful now and then throughout the summer'.³¹ Similarly the small flocks of sheep and goats were kept for family use. As the market for cattle declined, commercial sheep and pig rearing become more widespread, first among Borderers and Galwegians with easy

²² Ibid, p. 196.

²³ James Loch, *An account of the improvements on the estates of the Marquess of Stafford: In the counties of Stafford and Salop, and on the estate of Sutherland* (1820), pp. 64–5.

²⁴ Anon, *Perthshire husbandry* (1808), p. 436, quoted in John R. Baldwin, 'The long trek: Agricultural change and the great northern drove', in John R. Baldwin (ed.), *Firthlands of Ross and Sutherland* (1986), p. 189.

²⁵ G. S. MacKenzie, *General survey of the agriculture of the counties of Ross and Cromarty*, (1810), p. 82.

²⁶ Donahue, *Great meadow*, pp. xv, xvii; Robert A. Dodgshon and E. Gunilla Olsson, 'Productivity and

nutrient use in eighteenth-century Scottish Highland townships', *Geografiska Annaler* 70 (1988), pp. 39–51.

²⁷ For example in Hounam, Dalserf, Alford, Elgin. *New Statistical Account* [hereafter NSA], 3, p. 202; 6, p. 743; 12, p. 516; 13, p. 13.

²⁸ For example in Wick and Unst. NSA, 15, pp. 129, 44.

²⁹ For example in Ardchattan, Avondale, Kirkpatrick-Irongray, Linton, Mouswald, Sorn. OSA, 6, p. 177; 9, p. 385; 4, p. 531; 1, p. 133; 7, p. 301; 20, p. 151.

³⁰ OSA, 8, p. 51; 8, p. 150.

³¹ OSA, 4, p. 531.

access to the English market. Landlords like the Duke of Buccleugh specifically redeveloped the landscape to suit sheep, creating hay meadows by flooding to ensure a supply of winter feed, and planting shelter belts of trees.³² Highland tenant farmers varied their stocking ratios to respond to market demand.³³ Pigs were also sold on a commercial scale at local markets, such as at Thurso in Caithness.³⁴ Some of these breeders emigrated, starting commercial flocks and herds in Upper Canada.

To raise livestock successfully, farmers needed an intimate knowledge of the ecologies, climate and topography of their land. In his study of peasant agriculture in western India, Sandip Hazareesingh shows how 'over time landscape becomes legible and meaningful to humans partly through physical activity and labour'.³⁵ Dharwar's peasants knew their environment and devised strategies to gain optimum outcomes for subsistence. Similarly in Scotland, the dense naming of places, frequently after the types of work done there and their physical characteristics, including their properties of shelter, fertility, windiness or wetness, shows a deep understanding of how familiar landscapes affected human activity and how human activity had affected the landscape.³⁶ The properties of Upper Canada's old growth forests were unfamiliar, and therefore threatening, environments for Europeans.

II

Livestock were vital to Upper Canada's economy: in 1842 there were approximately 576,000 sheep, 505,000 cattle, 394,000 pigs and 114,000 horses.³⁷ Few backwoods settlers had horses, but cattle, sheep and pigs were prevalent. While MacDougall warned that trees in Upper Canada were 'so plentiful and so close together in the forest, that neither grass nor grain can grow there, only plants and young saplings', he also claimed 'the forests of America [were] famous for how well they support livestock' as they were permitted 'to roam through the forest all summer'.³⁸ As we have seen, Scottish farmers were not unfamiliar with such controlled foraging, though they were more accustomed to rough open pasture. A form of woodland grazing had been widespread in Scotland until the generation or two before the great transatlantic migrations. Cattle, sheep, horses and goats roamed among the scattered birch, rowan, willow, alder, hazel and pine found on lower slopes and by sheltered streams.³⁹ Sheep in Creich, Sutherland, found the 'leaves of trees ... their favourite food in summer; and the bark ... their medicine, as well as food in winter'.⁴⁰ By the nineteenth century such

³² Brian Bonnyman, *The third Duke of Buccleugh and Adam Smith: Estate management and improvement in Enlightenment Scotland* (2014), pp. 119, 135, 138–9, 142–3, 146.

³³ Robert A. Dodgshon, 'Livestock production in the Scottish Highlands before and after the Clearances', *Rural Hist.* 9 (1998), pp. 19–42.

³⁴ For example OSA 7, pp. 301, 309; 12, p. 159; 17, p. 569.

³⁵ Sandip Hazareesingh, 'Territories of conquest, landscapes of resistance: The political ecology of peasant cultivation in Dharwar, western India, 1818–1840',

J. Historical Geography 42 (2013), p. 92.

³⁶ John Murray, *Reading the Gaelic landscape: Leughadh aghaidh na tìre* (2014), particularly ch. 8.

³⁷ R. Louis Gentilcore (ed.), *Atlas historique du Canada*, II, (1993), Planche 14, 'La transformation du terroire, 1800–1861'.

³⁸ MacDougall, *Ceann-Iuil*, pp. 84, 86, 95.

³⁹ T. C. Smout, Alan R. MacDonald, Fiona Watson, *A history of the native woodlands of Scotland, 1500–1920* (2005), pp. 102–23.

⁴⁰ OSA, 8, p. 349.

woodland grazing was less common, especially in the Lowlands, except when animals were 'hard pressed for food' and drawn to small trees.⁴¹ The transition from utilizing open, lightly wooded landscapes to old growth forest was not easy, practically or psychologically. William Smith observed that the settler 'looks upon trees as enemies'.⁴² While the new farmer quickly learned the beneficial properties of woodlands, cultural perceptions only really changed after swathes of forest were cut through by roads, railways, farms and towns.⁴³ At an optimistic average of initially clearing four acres a year (other estimates suggest a single man without oxen could only clear one and a half), immigrants had to learn to use an unfamiliar ecosystem to their advantage.⁴⁴ They quickly discovered woods were a vital grazing resource. Even assuming a level of exaggeration in settlers' accounts, most found them serviceable pasture from April until November. What type of grazing was available in the forest? Which animals fed there, where and when?

Upper Canada is geographically varied so settlers had to learn their local topography with its implications for erosion and drainage, and soil type with its resulting vegetation. Some cleared parts of Grenville County were irredeemably stony and best for permanent pasture, whereas the deep, grey-brown podzols of Wellington and Oxford Counties were ideal for arable after the ground was cleared and stumped.⁴⁵ In a few parts of Upper Canada settlers found good pre-existing pasture. Near the St Clair River, Loyalists raised cattle cheaply and commercially on the oak plains and in wet areas.⁴⁶ Near Rice Lake the Mississauga had created pasture through strategic burning.⁴⁷ However, most of the colony was wooded. Tree cover varied, but most was mixed deciduous.⁴⁸ Andrew Bell noted maple, hemlock, cedar, white cedar, hickory, while Alexander Watt added beech and ash.⁴⁹ Trees provided clues to the soil: on well-drained sites sugar maple, beech and perhaps birch, ash or elm dominated whereas on poorly drained sites elm grew with tamarack, pine, aspen, grey birch, white cedar or black ash.⁵⁰ Bell, horrified at the ecology of Perth County, saw hope in the 'pile of grass growing ... in beaver meadows'.⁵¹

⁴¹ NSA, 15, p. 108.

⁴² William H. Smith, *Canada: Past, present and future: Being a historical, geographical, geological and statistical account of Canada West* (2 vols, 1852), I, p. 283.

⁴³ Allan Smith, 'Farms, forest and cities: The image of the land and the rise of the metropolis in Ontario, 1860–1914', in David Keane and Colin Read (eds), *Old Ontario: Essays in honour of J. M. S. Careless* (1990), p. 74. Smith summarises the debates of historians and literary scholars about the variety of attitudes to forest on p. 91.

⁴⁴ McCalla, *Planting the province*, p. 69; Peter Russell, 'Forest into farmland: Upper Canada clearing rates, 1822–1839', *Agricultural Hist.* 57 (1983), p. 335.

⁴⁵ N. R. Richards, B. C. Matthews, F. F. Morwick, *Soil survey of Grenville County Ontario* (Report 12 of the Ontario Soil Survey, 1949), p. 15; D. W. Hoffman, B. C. Matthews, R. E. Wickland, *Soil survey of Wellington County Ontario* (Report 35 of the Ontario Soil

Survey, 1963), p. 25; R. E. Wicklund, N. R. Richards, *Soil survey of Oxford County Ontario* (Report 28 of the Ontario Soil Survey), 1961), pp. 11, 24.

⁴⁶ W. S. Wallace, 'Captain Miles MacDonell's "Journal of a jaunt to Amherstburg" in 1801', *Canadian Historical Rev.* 25 (1944), p. 171; Robert Jones, *History of agriculture in Ontario, 1613–1880* (1946), p. 31; Smith, *Canada: Past, present and future*, pp. 19, 29.

⁴⁷ Neil S. Forkey, *Shaping the Upper Canadian frontier: Environment, society and culture in the Trent Valley* (2003), pp. 7, 29.

⁴⁸ Wood describes regional variation. Wood, *Making Ontario*, pp. 106–108.

⁴⁹ Bell and Watt quoted in Lamond, *Rise and progress*, pp. 73, 85.

⁵⁰ B. C. Matthews, N. R. Richards, R. E. Wicklund, *Soil Survey of Glengarry County Ontario* (Report 24 of the Ontario Soil Survey, 1957), pp. 31, 49.

⁵¹ Bell quoted in Lamond, *Rise and progress*, p. 73.

When beaver build dams, the resulting ponds kill the trees on the river bank upstream. Sediment is deposited on the pond bed. When beaver abandon the site and the dam breaks, the former pond bed becomes a nutrient-rich, open meadow hosting a wide range of herbaceous plants.⁵² Experienced Scottish farmers explored their lots for wet pasture, knowing their value for feed.⁵³ Bell found meadows as large as 20 acres and growing ‘a sort of coarse grass which is used for feeding cattle in winter’.⁵⁴ Watt was pleased with his ‘small swamp for grass, and a fine beaver meadow: I could keep a cow on it: it is, I think, 6 acres, all with a fine long grass’.⁵⁵ Near Goderich, MacDougall found ‘fine, natural grass grows on low pools beside rivers ... and tough, strong grass ... here and there throughout the forest, around hollows and marshes’ which was useful for grazing but not for growing crops.⁵⁶ In his delight at exploring such a meadow at Moir’s Creek in Nicol Township Andrew Dalgarno, armed with his scythe, lost himself in the forest for two days.⁵⁷ It is easy to underestimate the amount of wetland in Upper Canada in the early nineteenth century as settlers actively drained many swamps to create or improve meadows, and others evaporated when they lost the protection of the forest canopy.⁵⁸ A study of wetland loss between 1800 and 2002 found that in southwest Ontario, the western sector had lost over 85 per cent and the southeastern sector approximately 70 per cent.⁵⁹ The forest was not monolithic and parts provided settlers with the natural grazing which was so important when they first arrived.

Even in more densely wooded areas, the forest floor provided some grazing. In spring those cattle still in decent condition built up their strength in heavily timbered areas. These were clear of snow and more hospitable to tender new growth.⁶⁰ In fortunate southern parts, such as around the River Thames, the forest was ‘covered with grass, in a state of nature’.⁶¹ However in most regions undergrowth was a succession of plants. The wild onion was a springtime saviour for the desperate livestock owner. It was a ‘most substantial, powerful meal, strengthening the cattle’. Unfortunately it left ‘a memorial behind, as long as a piece of spring butter or cheese remains’, which tasted ‘as sour as garlic’.⁶² Catharine Parr Traill, the English wife of an Orcadian Scot, appreciated that this ‘wild leek’ – which sprang up ‘in the rich leafy soil of the woods’ – restored to health ‘the cattle that are poor and weak, and often in a diseased condition from poor feed during the long winters’. However she recommended the resulting ‘odious’ milk only be used for calves.⁶³ The next plant to appear, cattle cabbage, was more satisfactory.⁶⁴ By May, the grass in the fields of more developed farms could support cattle.⁶⁵ However in some townships the woods were the only source of feed. This was particularly so in newly settled areas like Southwold where they had ‘as yet only made use of the pasture in the woods, in a

⁵² J. P. Wright, C. G. Jones, A. S. Flecker, ‘An ecosystem engineer, the beaver, increases species richness at the landscape scale’, *Oecologia* 132 (2002), pp. 96–101.

⁵³ NSA, 14, 48; Taylor, *Wild black region*, pp. 48, 50.

⁵⁴ Bell quoted in Lamond, *Rise and progress*, p. 73.

⁵⁵ Alexander Watt to his friend in Quebec, 10 Oct. 1820, quoted in Lamond, *Rise and progress*, p. 85.

⁵⁶ MacDougall, *Ceann-Iuil*, p. 87.

⁵⁷ Wellington County Archives [hereafter WCA], A1991.46, p. 23, quoted from *The Elora Observer*, 1866.

⁵⁸ Wood, *Making Ontario*, pp. 12, 17.

⁵⁹ Environment Canada report: Southern Ontario wetland conversion analysis (Mar. 2010) www.ducks.ca/assets/2010/10/duc_ontariowca_optimized.pdf

⁶⁰ Robert Gourlay, *Statistical account of Upper Canada* (1822), pp. 410, 413.

⁶¹ *Ibid.*, pp. 343, 103.

⁶² MacDougall, *Ceann-Iuil*, p. 85.

⁶³ Catharine Parr Traill, *The female emigrant’s guide, and hints on Canadian housekeeping* (1854), p. 184.

⁶⁴ MacDougall, *Ceann-Iuil*, p. 86.

⁶⁵ Gourlay, *Statistical account*, p. 505.

state of nature'.⁶⁶ Similarly, Yarmouth's residents rejoiced in the quantities of milk produced by grazing their cattle on their 'forest pasture'.⁶⁷ Farmers in Grantham estimated that a four-year-old ox would gain 200–250 lb if fed. It would still gain 150–170 lb if simply grazed in the woods.⁶⁸ Those in Norwich agreed, maintaining an ox would gain a third in a summer's run in the woods and become excellent beef.⁶⁹ These beasts may well have been accessing natural meadowland as well as foraging on the forest floor.

Pigs were adept at foraging as well as eating farm and household leftovers: abandoned grain, windfall apples, vegetable peelings, frozen potatoes, and dairy by-products. *The Skilful Housewife's Guide* suggested even the otherwise unusable milk of a cow with infected teats could be fed to swine.⁷⁰ They were usually an early purchase of new settlers. MacDougall declared the 'farmer without pigs in America, is not worth much; he is a senseless man, a useless husband, and a bad neighbour'.⁷¹ MacDougall made his point using a form reminiscent of Gaelic satire to shame fellow Highlanders out of their trailing suspicion of the animals. He argued a piglet could be obtained for a mere day's work and at six weeks old it could support itself in the forest. In a good year for nuts, even snow did not discourage them from spending all day digging for them. These razorback hogs were apparently 'long snouted, long legged, ravenous looking brutes'.⁷² They did not fatten easily but did well running loose in the woods.⁷³ For hogs destined for market, the *Colonial Advocate* suggested more lavish fare. Piglets were fed boiled apples, pears, pumpkins, potatoes and squash. After harvest they should run in the orchard before being fattened on a thrice daily thick mash of rye, buck wheat, Indian corn (maize), potatoes and pumpkins. These choice creatures would then luxuriate on beds of fresh straw.⁷⁴ This level of care was for the well-established settler rather than those primarily relying on the forest.

As it took time to build up stock, in early years people relied on forest wildlife as a source of protein. Bell noted the abundance of 'deer, martins, otters, fishers, beavers, foxes, squirrels, hares, musk-rats, racoons, geese, ducks, eagles, partridges, woodcocks, and a great many small birds and beasts'. His new home also abounded 'with small rivers and lakes, which swarm with fishes of all sorts and sizes; in the spring, when they are so fat that they won't take bait, we spear them ... They are caught with nets too'.⁷⁵ Further west, Robert Scott commented on bass, salmon and trout, weighing up to eight pounds, in the stream running near his log house. He hunted pigeon, partridge and deer in the summer.⁷⁶ John Carnegie's dog Coaly was expert in flushing out deer and he was often tempted to go hunting.⁷⁷

⁶⁶ Ibid, p. 345.

⁶⁷ Ibid, p. 343.

⁶⁸ Ibid, p. 423.

⁶⁹ Ibid, p. 334.

⁷⁰ Anon, *The skilful housewife's guide: A book of domestic cookery* (1848), p. 114.

⁷¹ Ibid, p. 105.

⁷² J. F. Johnston, *Report on the agricultural capabilities of the province of New Brunswick* (1850) p. 65; *Notes on North America: Agricultural, economical and social* (1851), p. 74. Quoted in Craig, *Backwoods consumers*, p. 146.

⁷³ Percy Bidwell and John Falconer, *History of agriculture in the northern United States, 1620–1860* (1941), pp. 229–30; Jones, *History of agriculture in Ontario*, p. 77.

⁷⁴ *The Colonial Advocate*, 15 Apr. 1830.

⁷⁵ Bell quoted in Lamond, *Rise and progress*, p. 74.

⁷⁶ Provincial Archives of Ontario [hereafter PAO], F496, Scott Family Letters, Robert Scott to Joseph Scott, 24 Aug. 1835.

⁷⁷ PAO, MU4788, Carnegie Family Papers, F103, B286682, John Carnegie jun. to George Carnegie, 7 Jun. 1836.

Carnegie did occasionally provide venison and fish for the table, but recognized that hunting, although enjoyable and productive, took him away from the farmwork.⁷⁸ As domestic livestock increased, hunting declined.

The consensus of settlers across a wide swathe of Upper Canada is that, when necessary, the forest was a passable larder for a family and its livestock, at least throughout the summer. Hunting provided fresh meat for the table and natural grassland, beaver meadow, and the forest floor provided a diet that could sustain a few sheep and cattle and many pigs. Woodlands are capable of sustaining a low level nutrient loss over the long term.⁷⁹ There is no indication that forest lands were held or managed in common, unlike upland grazing in Scotland, especially the Highlands. In summer individual forested lots were therefore a vital resource for the first generation of settlers. Winter was even more of a challenge.

III

MacDougall found ‘wintering livestock in Canada is a distressing business, and losing them in spring is the most vexing thing that can happen to a person’.⁸⁰ William Webster’s first winter, 1842–3, was long. Many farmers were without feed for a month and a ‘vast lot of cattle died for want of provisions’.⁸¹ Successfully bringing stock through the winter required careful strategic decisions throughout the year: how many beasts to purchase, how many to slaughter in November, what shelters to build, and what crops to grow. Even for settlers with agricultural experience, the greatest challenge was their inexperience of the climate and ecology and their lack of hay and farm infrastructure. Farmers with some cleared land prioritized a significant proportion for hay; others relied on leaf fodder, spoiled crops and reducing calorie loss by providing animals with shelter from the elements. The forest was an important resource for winter stock keeping.

Hay production was the limiting factor for keeping livestock over the winter. Seasonal prices tell their own story. A milk cow cost \$25–30 at the end of spring with the summer’s free grazing imminent, but \$15–20 at the beginning of winter when months of feeding loomed.⁸² Farmers endeavoured to keep costs low by growing their own hay. John McIntyre exclaimed that with ‘as much hay in the State of Ohio I would have foddered four times the stock on it’.⁸³ He complained of having to feed his cattle for nearly three-quarters of the year so ‘consequently can never keep proper stock’. By early May the hay was finished but the grass was still marginal and his twelve sheep could scarcely ‘pick enough from our snow bleached fields to keep them in life’. In 1833, John Crerar decided emigration was a better option than being prosecuted for whisky smuggling in Glenquach. Crerar knew cattle, having leased an eight-acre Perthshire farm with rights to common hill pasture. Then aged 44, he set himself up on 300 acres in Upper Canada. In Marvin McNinnis’ classification, a large farm was 170

⁷⁸ PAO, MU4788, F103, B286682, John Carnegie jun. Jun. 1843.
to John Carnegie sen., 30 Aug. 1834.

⁷⁹ Donahue, *Great meadow*, p. 62.

⁸⁰ MacDougall, *Ceann-Iuil*, p. 96.

⁸¹ Aberdeen University Special Collections [hereafter AUSC], MS2844, William Webster to James Webster,

Jun. 1843.

⁸² MacDougall, *Ceann-Iuil*, p. 96.

⁸³ WCA, McCorkindale Family (Guelph) letters, A2004.88, John MacIntyre to Archibald McCorkindale, 9 May 1837.

acres so Crerar was at the top end of the scale.⁸⁴ He had enough credit or cash for the land, to provide for his family until the next harvest, and to purchase a yoke of oxen and two cows at \$20 each. That by 1842 he had 80 acres cleared also shows he could afford to hire hands for felling. In his first decade in Canada he became a successful mixed farmer. He had selected fertile land underlain by the limestone which would keep his crops supplied with calcium. The undulating topography meant it was well-drained with some marshy depressions.⁸⁵ On this he harvested 14 acres of wheat, ten of oats and seven of other crops. He devoted 25 acres to hay which he used for three yoke of oxen, three steers, six milk cows, four heifers, six yearling steers, five calves, 29 sheep, and 18 hogs.⁸⁶ While Crerar was an exceptionally well-off and successful immigrant, establishing hay as a priority crop was a typical strategy. Crerar could support his stock with hay because, as well as possessing significant resources when he immigrated, he had been clearing and farming in Upper Canada for nine years. But how did newly arrived settlers, who had no opportunity to grow a hay crop, overwinter their stock?

Winters were longer and harsher than those to which Scots were accustomed. MacDougall warned new arrivals against bankrupting themselves through buying more stock than they could support.⁸⁷ Forest resources were critical in those initial winters. Elizabeth Dickson from Roxburghshire was nervous about the snows in McKillop Township. She was assured by her neighbour that her cattle would obtain enough nourishment if she cut 'down branches of certain trees'. Leaf fodder, known in Scandinavia and parts of England, was clearly unknown in the Scottish Borders.⁸⁸ Woodlands there were scarce and for commercial purposes, not grazing.⁸⁹ Roxburghshire's cattle were fed grass, hay and turnips.⁹⁰ Dickson's neighbour in Canada optimistically claimed her cattle would look 'better than at home fed on more expensive keep'.⁹¹ He was not unusual in this opinion. Catharine Parr noted cattle browsing on the shoots of felled bass, elm and beech during the winter 'chopping season'.⁹² MacDougall described the tops of maples as 'juicy' and one Aberdeen man found them 'sumptuous' fare.⁹³ His opinion may have developed from experience in north-east Scotland where it was common to use the crushed shoots of whin and pine as feed.⁹⁴ Along with a weekly dish of salt, this leaf fodder was considered adequate for the Canadian winter. A little knowledge meant animals could be fed directly from the forest.

Animals were also fed from the forest indirectly. New arrivals usually managed to get in some seeds among the stumps of their initial clearings and these grew prolifically in the virgin soil, fertilized by the burning of brush and branches. While intended for human

⁸⁴ Marvin McInnis, 'Marketable surpluses in Ontario farming, 1860', *Social Science Hist.*, 8 (1984), pp. 410–11.

⁸⁵ Hoffman *et al.*, *Soil survey of Wellington County*, 23; Wicklund *et al.*, *Soil survey of Oxford County*, p. 10.

⁸⁶ 'Letters collected by the Canada Company to encourage emigration, 1842', Fisher family from Aberfeldy, accessed 19 Mar. 2014, <http://www.fisherfamily.me.uk/history/canada.html>.

⁸⁷ MacDougall, *Ceann-Iuil*, p. 96.

⁸⁸ Smout, *Exploring environmental history*, p. 62; Donahue, *Great meadow*, p. 62.

⁸⁹ This was partly due to extensive sheep farming. Smout, *Exploring environmental history*, p. 55.

⁹⁰ NSA, 3, pp. 183, 271, 275, 445.

⁹¹ PAO, F496, Mrs Archibald Dickson to James Turnbull, 29 Sept. 1834.

⁹² Traill, *Female emigrant's guide*, p. 184.

⁹³ MacDougall, *Ceann-Iuil*, 99; National Library of Scotland, RB.s.956 (a), *Counsel for emigrants*, pp. 33–4.

⁹⁴ Alexander Fenton, *Scottish country life* (1976), p. 141.

consumption, that first winter lack of knowledge meant spoiled crops were often on the menu for livestock. Scots were used to storing potatoes in ‘tattie pits’, self-draining hollows in the ground, close enough to the house that a child could be sent out to burrow for a handful for each dinner. Immigrants quickly discovered the bitter cold destroyed buried potatoes. Crop damage remained a peril for the experienced. Dalhousie Township’s inedible potatoes of 1836; Brantford’s rust-damaged wheat of the warm, damp year of 1844; and the 1846 crop in parts of Esquesing all ended up in the bellies of beasts.⁹⁵ When part of his 1836 oat crop was too late to be edible, John Millar fed it to his ‘two very smart little horses’, six cows, eleven sheep and ten swine.⁹⁶ While well-settled farmers as well as new arrivals might use ‘forest browsing’ and recycle spoiled crops as winter feed, those who had been longer in-country had an advantage when it came to overwintering: they could bring their animals in from the cold.

Winter underfeeding and improvising animal feed was typical in New England, Nova Scotia and New Brunswick as well as in Upper Canada and Scotland.⁹⁷ Although loss of condition was acceptable, farmers tried to mitigate this not only through ‘inputs’ of feed, but by reducing ‘outputs’ of calorie loss. In a relatively treeless landscape, Scots were accustomed to housing livestock, especially milk cows, with timings dependent on the local climate. Regional patterns developed in Upper Canada. By Lakes Ontario and Erie, stock were brought in around early December. In more north-easterly areas it was November. There they remained until the snow was off the ground. In mild Niagara this was early March, but in most areas grass was not through until April or May.⁹⁸ Settlers built barns, sheds and ‘shelters’. In Grenville County John Millar observed some Scots ‘put them up in a house’. His meaning is unclear. Normal usage suggests he was using ‘house’ and ‘barn’ synonymously, but he then explains he has just built a log barn ‘42 feet by 22 [feet] which will hold the cattle in one end’.⁹⁹ It is therefore possible his neighbours built homes in which humans and livestock shared a roof. This was the ordinary living situation for most rural Scots well into the nineteenth century.¹⁰⁰ While such houses were usually dark and inhabitants ran the risk of tuberculosis, it was an efficient use of building supplies and the livestock acted as a type of central heating. Cattle were kept in the lower end where dung and bedding was easily collected to fertilize the fields.¹⁰¹ This management transferred nutrients and organic matter from the forest and meadow to tilled land via the dung and the straw which absorbed urine, binding its nitrogen.¹⁰²

Not all overwintering facilities for stock were as substantial as shared accommodation or John Millar’s log barn, so certain types of animal were prioritized. In Sandwich horned cattle were ‘better in sheds’ whereas in Kingston horses were stabled, but not cattle.¹⁰³ In

⁹⁵ Alexander Carlyle to Thomas Carlyle, 14 Mar. 1845, in Edwin Marrs, *The letters of Thomas Carlyle to his brother Alexander* (1968), 609–10; WCA, A2004.88, 9 May 1837; PAO, F555, MU1979, Malcolm McNaughton Papers, Malcolm McNaughton to John McNaughton, 22 Aug. 1846.

⁹⁶ LAC, R4416-0-9-E, John Millar and Family Collection, John Millar to James Millar, 20 May 1837.

⁹⁷ Craig, *Backwoods consumers*, p. 162.

⁹⁸ Gourlay, *Statistical account*, p. 413.

⁹⁹ LAC, R4416-0-9-E, 14 Nov. 1834.

¹⁰⁰ Alexander Fenton, ‘The housing of agricultural workers in the nineteenth century’, in T. M. Devine (ed.), *Farm servants and labour in Lowland Scotland, 1770–1914* (1984), p. 196.

¹⁰¹ OSA, 8, p. 344.

¹⁰² Donahue, *Great meadow*, p. 161.

¹⁰³ Gourlay, *Statistical account*, pp. 278, 474.

Malden in the milder southwest only cattle which were being used, presumably for logging, were taken in.¹⁰⁴ In Willoughby and Stamford townships young cattle, and sometimes horses, were expected to find what shelter they could in the woods.¹⁰⁵ New settlers with no time to build barns or sheds, had to be strategic. Traill recommended a night enclosure for cattle that roamed ‘at large in the woods and wastes’, pointing out that warm yards were as useful as a good feeding.¹⁰⁶ She held that cattle should be milked early and then turned out. To ensure they returned they should be given occasional fodder and milked in the same place each evening. Some settlers trained cattle to respond to the sound of a horn. This method avoided wasting days searching for strays and it mitigated the more dramatic risk of children, sent out to retrieve them, meeting a frozen fate in the woods.¹⁰⁷ It did not reduce the risk of stock being eaten by wild animals. MacDougall advised those planning to outwinter cattle to select a hardy breed. He explained the common type of cow in Upper Canada was different to those to which his Highland compatriots were accustomed, being ‘long-legged, smooth, lean – with slender thighs ... long, narrow, elegant necks’ and producing a good yield of milk.¹⁰⁸ However, the small Highland cattle with their double coat were well adapted for tough conditions.¹⁰⁹ He reassured potential settlers that, despite what they had heard, it was possible to outwinter them ‘from Hallowtide to May Day, with only the remains of the fodder they get in the evening between them and the snow’, a diet similar in its sparsity to that of Scotland.¹¹⁰ He describes his herd, lingering by the forest edge, close to the house, trampling round hollows in the snow for a bed. Covered in snow, icicles hung from their noses. So, the well-informed backwoods settler carefully selected a hardy breed which could outwinter, grazed them in the forest with occasional feed supplements, and provided some shelter by using the forest and a yard. On more developed farms, barns were selectively used to house and feed priority beasts such as milk cows and working oxen. Settlers raising sheep were equally attentive and strategic.

Alexander Brown, an experienced shepherd from Glencairn in Galloway, optimized the performance of his commercial flock in Flamborough by evaluating climate and feed. He raised cheviots and cheviot crosses sufficiently hardy for snowy winters, carefully organizing the winter routine.

I keep my ewes of two years old and upwards, with my wethers, in a body apart by themselves, and give them plenty of good hay, but not red clover hay, which is not good for them. I have sheds for them at night; when the weather is stormy, and the snow deep, they are kept in these sheds in the day time; but only in such cases, as it is of the utmost importance to sheep to have freedom, when the weather renders it at all possible. The spring lambs, and the wether sheep, I keep apart by themselves in a comfortable place, giving them, besides good hay, occasionally a little grain, oats, pease or maize are good, I do not think much of buck-wheat, but though I have not had much experience of oil-cake, I know that

¹⁰⁴ Ibid, p. 282.

¹⁰⁵ Ibid, pp. 413, 418.

¹⁰⁶ Traill *Female emigrant's guide*, p. 184.

¹⁰⁷ Ibid., pp. 180–81.

¹⁰⁸ MacDougall, *Ceann-Iuil*, p. 94.

¹⁰⁹ Ibid, 98; conversation with Issie MacPhail, Jan. 2015.

¹¹⁰ MacDougall, *Ceann-Iuil*, p. 98.

its mixture with wheat, or bran, will answer well. I give all my sheep salt, once a week, two quarts serve 100 sheep.¹¹¹

Settlers varied in their approach to wintering depending on location, breed, type of animal, availability of feed and professional opinion. Most new arrivals in the backwoods had little choice but to outwinter their stock as they lacked barns and fodder. Those on longer-established farms could shelter stock and supply relatively large flocks and herds with home-grown feed. Every winter strained settlers' resources, and periodically harsh seasons caused great suffering. Political ecologists have pointed out that natural environments are not passive, waiting to be moulded into patterns by humans, but possess their own power to impinge on and subvert human intentions.¹¹² This must have been starkly apparent as Bell stared at the thick forest and Dickson worried about feeding her cattle through the winter. It is unsurprising that the reactions of settlers, particularly those coming from highly managed landscapes, could initially be hostile to Upper Canada's forest. However once they learned to utilize these resources they continued to do so for many years. As McCalla has shown, the forest was harvested for many products.¹¹³ Its capacity to feed and shelter animals should be added to this list. However settlers did not see the forest as sufficiently abundant for their agricultural ambitions. Their aim was to replace much of it with the hay, roots and grain which could support the family and keep larger herds and flocks more securely throughout the year.

IV

Arable land, painfully claimed from the forest, was used optimally to ensure the existence of the embryonic farm. The staples approach, which focused on commercial exports, created the impression that Upper Canadian farmers primarily used cleared land for wheat.¹¹⁴ McCalla, Wood and Craig have shown how much more sophisticated was the rural economy. A deeper exploration of the complexity of pioneer farms is profitable in understanding this economy, the nature of farmwork, farmers' tactics and their relationship to the forest. Wheat sold off the farm was undoubtedly important, but the evidence of settlers' letters and of the 1842 census shows farming, including choice of crops, was diverse. Much of this strategy revolved around the need for winter feed.

The requirements of livestock and the requirements of initial clearing worked symbiotically. Oxen were necessary for speedy logging, and once sufficient daylight penetrated the canopy and the undergrowth was cleared, feed crops could be planted. The tendency of the ubiquitous pigs to churn up land, so problematic in Scottish farms where they roamed free, became an advantage when settlers wanted to break up underlying root systems.¹¹⁵ Turnips and potatoes, recognized in Scotland as good for breaking in land, were often planted

¹¹¹ 'Sheep farming in Canada', *Colonial Advocate*, 3 June 1824, cited at http://www.electricscotland.com/History/canada/sheep_farming.htm (accessed 4 Feb. 2014).

¹¹² Paul Robbins, *Political ecology: A critical*

introduction (2012), p. 5, cited in Hazareesingh, 'Territories of conquest', p. 89.

¹¹³ McCalla, *Planting the province*, pp. 64–5.

¹¹⁴ *Ibid.*, p. 5.

¹¹⁵ Conversation with Issie MacPhail, Jan. 2015.

early, as was maize which grew well in recently cleared ground.¹¹⁶ This process of claiming forest land was messy, and offensive to the eye that equated good practice with Britain's improvement agriculture. W. G. Mack described the Upper Canadian landscape in the midst of this process: 'the number of acres cleared around the unseemly-looking log houses; the black stumps and ragged patches of grain or potatoes giving the whole an air of desolation and discomfort'.¹¹⁷ Despite aesthetic inadequacies, these 'ragged patches' fed humans and stock. Charlottenburgh was settled in 1784 by Highland Loyalists. Thirty-five years later the MacIntyres, Mackenzies, Camerons and their neighbours assembled and explained how they managed the land admired by Mr Johnston as he walked through with his dog. Immediately after clearing they raised a crop of potatoes; or wheat on dry land; or oats on low land. Following innovative 'high farming' techniques, the grains were seeded with timothy. The ground was given over to four or five crops of hay after which it was dedicated to pasture for a few years. This hay allowed each Charlottenburgh cow to produce 4-6lbs of dairy per week and an ox to gain a third more weight. Any remaining tree roots had by then rotted sufficiently to be removed and the land was ready for ploughing and a few years of wheat before being returned to pasture.¹¹⁸ The farmer was then well on the way to developing one of the 'very beautiful farms cleared of stumps, laid out into neat fields, with good frame houses and large barns' characteristic of successful established farmers.¹¹⁹ Thereafter a crop rotation was employed. These varied regionally, but – as in Scotland – all used grass as an integral part of restoring fertility as well as for feeding stock.¹²⁰ The feeding needs of livestock, including hay, root crops and pasture, as well as their labour, especially their production of manure, made livestock a driving force in the creation of viable farms.

Using cleared land for growing winter feed was a primary strategy. John MacIntyre explained how he fed his animals through the winter of 1840–41: 'I had a good many fine Swedish Turnips that was a great help. I had hay till the middle of this month[. W]e have the horses and oxen working every day[:] the horses get pease and oats, and the oxen boiled pease and scalded chaff and potatoes'.¹²¹ Similarly, Traill recommended a diet of turnips supplemented with a quart of boiled oats in water or bran twice a day. The residual taste of turnip in the milk could be dealt with by adding a little saltpetre in warm water. A more 'troublesome' feed supplement was boiling hay to make a warm drink for cattle.¹²² A close analysis of what some settlers chose to grow and their own explanations of how they used this harvest, demonstrates that they dedicated large proportions of their cleared land, as well as their forest and meadow, to sustaining livestock.

A typical range of crops included oats, barley, wheat, Indian corn, grass, hay, turnips and potatoes. While some was for eating and some for sale, a goodly amount was for livestock, as

¹¹⁶ OSA, 16, p. 187; NSA, 14, p. 369; Dodgshon and Olsson, 'Productivity and nutrient use', p. 42; Robert A. Dodgshon, 'Strategies of farming in the western Highlands and Islands of Scotland prior to crofting and the clearances', *ECHR* 46 (1993), pp. 689; Donahue, *Great meadow*, p. 88; Forkey, *Upper Canadian frontier*, p. 35.

¹¹⁷ W. G. Mack, *A letter from the Eastern Townships*

of Canada (1837), p. 6.

¹¹⁸ Gourlay, *Statistical account*, p. 562.

¹¹⁹ Mack, *Letter from the Eastern Townships*, p. 6.

¹²⁰ Gourlay, *Statistical account*, p. 398.

¹²¹ WCA, A2004.88, John MacIntyre to John McCor-kindale jun., 4 Mar. 1841.

¹²² Traill, *Female emigrant's guide*, pp. 180, 183.

was straw and stubble, providing a balanced diet of nutrients and roughage.¹²³ In Grenville County, John Millar's first crop was focused on the needs of livestock.¹²⁴ He harvested 110 bushels of oats, 100 bushels of potatoes, and 200 stones of hay from the semi-cleared farm. Nearby in Lower Canada, William Buchan commented that barley was excellent for fattening pigs 'which fetch, as pork, a much higher price than any other meat'.¹²⁵ Three years after emigrating to Peterborough, John and Charlotte Carnegie listed six acres of potatoes, two of Chevalier barley, four of common oats, two of Indian corn, three of potatoes, two to three of Swedish turnips, two of peas and about eight of hay.¹²⁶ This resembles the range in pastoral areas of Lowland Scotland where the winter diet of dairy cattle included swedes, beanmeal, hay and straw.¹²⁷ By the 1820s, the long-standing Scottish dependence on oats, bere (a form of barley) and pease was supplemented by the turnip.¹²⁸ Even if the Carnegies had broken with agricultural practices in Scotland and Canada, consuming all the potatoes, corn and peas themselves, out of the 30 acres they cropped that summer season, still a full third was dedicated to hay and turnips. This range of crops, selected with animals as much as humans or markets in mind, was not unusual. [Table 1 details](#) proportions of crops grown by Scots settlers in the 1830s and early '40s. The small sample means it is only suggestive. Nonetheless, the importance of fodder in the early decades of settlement is striking.

Each of these settlers began farming by felling old growth forest, each operated the typical mixed farm, and each had been settled for under ten years, so they are roughly comparable. The proportions given over to feed crops vary from 46 per cent to 70 per cent.¹²⁹ As previously noted, Crerar, but also Frazer and Stewart, were atypical in their rate of clearing. Presumably the Canada Company, who published accounts of these men's achievements, wished to emphasize the most successful. However this does not affect the clear pattern: that new farmers used their land to grow a wide variety of crops, a significant proportion of which was oriented towards overwintering livestock.

Two examples show why settlers planted a variety. Twenty years after settling in Esquesing, Malcolm McNaughton's letters to his brother in Glen Lyon, Perthshire, show he prepared for the annual unpredictabilities of weather. He and his son John maintained a balance of grains, root crops, hay and pasture. In 1830 they cut their 'indifferent' wheat and rye crop but failed

¹²³ The use of these crops for feed is detailed in many sources including MacDougall, *Ceann-Iuil*, p. 85; PAO, F496, Robert Scott to Joseph Scott, 24 Aug. 1835; McInnis, 'Marketable Surpluses', pp. 412–16. A low estimate of animal feed in Nova Scotia allocates annually 28 bushels of oats/barley to oxen, half as much to young cattle and 1 bushel to each sheep. Rusty Bittermann, Robert A. MacKinnon, Graeme Wynn, 'Of inequality and interdependence in the Nova Scotian countryside, 1850–70', *Canadian Historical Rev.* 74 (1993), p. 21.

¹²⁴ LAC, R4416-0-9-E, 14 Nov. 1834.

¹²⁵ William F. Buchan, *Remarks on emigration: more particularly applicable to the Eastern Townships Lower Canada* (1842), pp. 46–8.

¹²⁶ PAO, MU4788, F103, B286682, John Carnegie to

George Carnegie, 7 Jun. 1836. Carnegie lists potatoes twice, possibly intending to list another crop.

¹²⁷ R. H. Campbell, 'Agricultural labour in the South-West', in Devine (ed.), *Farm servants and labour*, p. 62.

¹²⁸ Malcolm Gray, 'Farm workers in North-East Scotland', in Devine (ed.), *Farm servants and labour*, p. 15.

¹²⁹ These examples could not be contextualised within the 1842 agricultural census as it did not record hay or pasture. Although the topography and soils are very different from Upper Canada, in his Cape Breton case study Bittermann found that mixed farming with a heavy emphasis on stock required 20–25% of improved land devoted to hay, slightly less to grains and 5% to pasture. The rest of the cleared area was pasture. Bittermann *et al.*, 'Of inequality and interdependence', p. 12.

TABLE 1: Proportion of feed crops

Date	Name	Region of origin	Upper Canadian location	Acreage of feed crops	Acreage of other crops	% feed crops
1824	Malcolm and Peggy McNaughton	Highland Perthshire	Esquesing	5.5	6.5	46
1836	Ninian Logan	Probably Lothian	Dundas	38	22	63
1836	John and Charlotte Carnegie	Berwickshire	Peterborough	15	15	50
1842	Robert Frazer	Highland Perthshire	North Easthope	59	26	69
1842	John Stewart	Highland Perthshire	North Easthope	63.5	27.5	70
1842	John Crerar	Highland Perthshire	North Easthope	55	26	68

Note: 'Feed crops' includes acreage designated as pasture, hay, Indian corn/maize, turnips. I have designated half of the oat acreage to animal feed and half to human consumption. This may be underestimating the quantity raised for feed as there is evidence that some Scottish settlers devoted all their oats to stock. Lamond, *Rise and progress*, p. 73. Turnips and Indian corn are not designated in the cases of Frazer, Stewart and Crerar so their animal-oriented crops are probably an underestimate.

Sources: McNaughton, PAO, F555, MU1979, 26 July 1824. McNaughton intended to clear a further nine acres by fall and plant it with winter wheat; Logan, James Logan, *Notes of a journey through Canada, the United States of America and the West Indies* (Edinburgh, Fraser & Co., 1838), p. 47; Carnegie, PAO, MU4788, F103, B286682, 7 June 1836; Frazer, 'Letters collected by the Canada Company to encourage emigration, 1842', Fisher family from Aberfeldy, accessed 19 Mar. 2014, www.fisherfamily.me.uk/history/canada.html; Stewart and Crerar, *Ibid.* Stewart assessed his acreage of oats and barley together as being 14 acres. I have assumed seven acres for each and have thus added seven acres to the feed and non-feed categories.

to get it in. In 1846 the farm's success depended not on their wheat which was unpromising owing to 'a great drouth' and 'the snow being so light and the cold frost snap', but on their potato, pea, oat, hay and apple harvest.¹³⁰ The next year hay was bountiful and wheat rust-free, but oats were 'rather light and so is peas'. Additionally potatoes were 'going to be a failure owing to the drouth. Pastures failed and water was scarce for stock'.¹³¹ To rely on only one or two sources of feed to get stock through the winter, or on a dominant crop, such as wheat, for a farm's annual survival, was to court disaster. A range also enabled farmers to rotate crops, replenishing the soil. Even for well-established and well-prepared farmers like John MacIntyre in Lanark County, getting the right proportions could be difficult. The long winters of 1830–31, 1836–37 and 1840–41, in which there was no substantial grass growth before May, caused 'great distress' and cattle could 'hardly subsist'.¹³² MacIntyre's hay and summer grain crop had been bountiful but he had failed to anticipate the poor wheat harvest and the long winter. In addition to 16 tons of hay he had:

¹³⁰ 'Drouth' is a Scots word for thirsty or, in this context, a drought.

¹³¹ PAO, F555, MU1979, 2 Aug. 1830, 29 Apr. 1845, 22 Aug. 1846. Craig noted farmers in Madawaska (New Brunswick and Maine) varied their crops in response to the 1840s wheat rust. Craig, *Backwoods consumers*,

p. 152.

¹³² WCA, A2004.88, 4 Mar. 1841; Middleville and District Museum, Reference No 122.86, George Easton Diary, 5 Nov. 1830, 10 May 1831. Thanks to Catharine Wilson for pointing me to this diary.

above 600 stooks of different kinds of straw besides pease straw, but I threw it out very unsparingly at the time of threshing never dreaming that the winter would continue so long ... I think I will always be more careful of straw than I have been. I gave a good deal of it away.¹³³

He supplemented with his good crop of swedes. Assuming turnip fly was kept at bay, most farmers produced several acres for winter fodder.¹³⁴ Emigrants used cheap root crops to reduce the demand on hay, just as they had done in Scotland.¹³⁵ The disadvantage was that they were tough on teeth.¹³⁶

Just as settlers would have eaten some of the root crop themselves, so they consumed a proportion of their grain. Indeed while most ethnic groups used oats for livestock, many Scots maintained their food culture by eating porridge and oatcakes.¹³⁷ However, not only was some grain intended as animal feed, in bad winters crops set aside for human consumption were sometimes sacrificed to prevent stock starving. In Dalhousie in 1841–43 farmers employed a number of strategies to keep herds and flocks alive. Some bought hay at vastly inflated prices and, even worse, others fed them seed grain and provisions intended for their family.¹³⁸ Even then many beasts died. In common with most Europeans, poorer Scots were familiar with a summer hungry season. That year even the reasonably well-off MacIntyres had no meal left and just enough grain to keep them until the next harvest.¹³⁹ When partial crop failure or a long winter could cause belt-tightening for the MacIntyres, they had many assets they could sell to buy supplies or to borrow against. For newly arrived settlers who had not yet built up assets or cleared substantial acreages, or backwoods farmers with marginal land, the seasonal round brought the possibility of seasonal want. As well as adverse weather or an infestation, fragile farm economies could be tipped over the edge by an accident like a housefire or injury, by a life stage such as old age or by having young children who took up a woman's time and energy but contributed nothing to the farm's productivity.¹⁴⁰ Hedging bets with a range of crops was then especially important.¹⁴¹ Variety was a normal strategy for settlers: Craig found that, until the 1830s, Madawaska settlers grew as wide a selection as conditions allowed. While wheat was often the main grain crop, grown for cash, farmers grew a variety of grains, root crops and hay, much intended for livestock rather than sale or human consumption. Planting a variety was important for nutritional reasons, and to guard against pest, disease and weather.

¹³³ WCA, A2004.88, 4 Mar. 1841.

¹³⁴ AUSC, MS2137/3, Papers of Rev. Patrick Bell, p. 267. In Scotland this was the case both in the Highlands and the Lowlands. Alexander Fenton, 'Agricultural change around Loch Ness, post Culloden' in *Loch Ness and thereabouts* (1991), p. 35; NSA, 2, p. 24. These examples from Inverness-shire and East Lothian are two of many.

¹³⁵ R. J. Colyer, 'Some Welsh breeds of cattle in the nineteenth century', *AgHR* 22 (1974), pp. 4–5; OSA, 20, p. 326; Fenton, 'Agricultural change', p. 35.

¹³⁶ G. G. S. Bowie, 'New sheep for old: changes in

sheep farming in Hampshire, 1792–1879', *AgHR* 35 (1987), p. 23.

¹³⁷ AUSC, MS2137/3, pp. 240–1.

¹³⁸ WCA, A2004.88, 4 Mar. 1841.

¹³⁹ *Ibid.*

¹⁴⁰ Just when the Carnegies were managing to establish themselves, their house burned down requiring them to rely on the generosity of neighbours and of family in Scotland who provided goods and financial loans for several years. PAO, MU4788, F103, B286682.

¹⁴¹ Craig, *Backwoods consumers*, p. 146.

The desire and the intent of most new settlers was to establish a mixed farm. The range of crops grown by Scottish immigrants in the early years and how they were used demonstrates that livestock were central to how settlers strategically approached land use. As much as 50 to 70 per cent of crops grown on the laboriously reclaimed fields was destined to be animal feed. Livestock were so vital that farmers would pay over the odds for hay and sacrifice seed grain and their own food supplies to keep the animals alive. While leaf fodder and hay from beaver meadows was useful for the winter, the best way to feed stock was not directly through the forest but by replacing it with pasture, meadows of more nutritious British grasses and cropland.

V

At any one moment during the first half of the nineteenth century, significant swathes of Upper Canada consisted not of well-established arable, but of backwoods farms: small fields of mixed crops wound around blackened stumps and surrounded by trees in whose shade browsed pigs, sheep and cattle. These were all hacked out of old-growth forest. Bell was not the only immigrant initially overwhelmed by being cast into this alien environment. Living in deep forest, rather than on open farm land or beneath treeless mountain horizons, had an emotional effect on some. Possibly the most famous reaction is that of John MacLean who emigrated from Tiree to Barney's River, Cape Breton. This is some distance from Upper Canada, but MacLean may have articulated the thoughts of our farmers too.

I'm here alone in the gloomy forest,
 My mind wanders, I cannot raise a tune.
 Everything is barren in Barney's River,
 With nothing better than the bare potato.
 Before I build a place here, and I plant a crop,
 and fell the dense forest
 With the strength of my shoulder, I shall be tired
 And my strength failing before the children grow.
 When you came to the place you cannot see anything
 But the tall forest blocking out the skies.¹⁴²

Keeping family and livestock alike was difficult for Scots unfamiliar with the ecology, and lacking detailed knowledge of the topography and how it interacted with seasons, climate and plant life.¹⁴³ Elizabeth Dickson, John MacIntyre, John Crerar, Peggy and Malcolm McNaughton were a few of those who experimented, read manuals, and crossed their fingers

¹⁴² Memorial University of Newfoundland Folklore and Language Archive, Memorial University of Newfoundland, www.mun.ca/folklore/leach/songs/CB/1-04.htm (Accessed 3 Mar. 2015). This poem was refuted by Allan 'the Ridge' MacDonald (b. 1794) from Lochaber, who settled on the Mabou Ridge in 1816 and who viewed his new home positively: www.mun.ca/folklore/

leach/singers/amacdonald.htm (accessed 16 Mar 2017).

¹⁴³ Meto Vroom classified landscape into three horizontal layers – the abiotic (non living), biotic (living) and cultural (human) – each of which interacts with each other. Cited in Murray, *Reading the Gaelic landscape*, p. 36.

as the slow years of knowledge built. Adapting their minimal or extensive knowledge of old country agriculture, they came to understand that the forest could be a friend. Not only was it a source of timber and potash, but a pastoral resource providing summer grazing, limited winter grazing and some shelter. It was best for pigs, but passable for cattle too. However, a successful mixed farm in Upper Canada relied on extracting many products from the land. Livestock were essential through their labour in hauling timber and ploughing; the products of their bodies for sale and domestic use; and their manure, which replenished the soil for crops. Providing for them was therefore a priority for new settlers. Relying on the forest as a direct feed source was possible but usually a short-term expedient, particularly important in the first few years. Settlers recognized its agricultural limitations and decided the best way to provide for stock was to replace large sections of woodland with meadow, pasture and tillage. They therefore had an ambivalent relationship with the forest. They retained woodland for firewood, building materials and maple syrup, but intended to bring their lot as close to an improved Lowland farm as topography would permit. There were doubtless aesthetic aspects to this, as J. I. Little has found among emigrant gentry.¹⁴⁴ There were certainly deep ideological motivations, informed by Enlightenment attitudes and high-farming techniques, which were being simultaneously enacted on the Scottish landscape.¹⁴⁵ On the pragmatic side was the absolute need to feed family and livestock. Livestock were a vital resource in this project and their need for year round feeding strongly influenced settlers' strategies as they created mixed farms with a wide range of crops.

¹⁴⁴ J. I. Little, 'Canadian pastoral: promotional images of British colonization in Lower Canada's Eastern Townships during the 1830s', *J. Historical Geography*, 29 (2003), pp. 189–191.

¹⁴⁵ Bonnyman, *Third Duke*, pp. 129–30.