

**Turning a New Leaf: Uncovering Medieval and Early Modern Roots of Canadian Forest  
Management for a More Sustainable Future**

by

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

## ABSTRACT

Canada's history of forest natural resource extraction and exploitation is often told through colonial perspectives of lumberjacks, river drives, and sawmills. Many historians neglect the influences of pre-industrial forest management that inform modern forestry practices in diverse ways. Of particular interest to the Canadian context are the multitude of management practices, techniques, and attitudes that can be found in the High Middle Ages of England. Coppicing, the cutting of a tree at the stump and subsequently harvesting the shoots after several years, practiced by the medieval English draws attention to principles of sustainability and ecological responsibility in a much more distant past. The *Forest Charter of 1217* further asserts forests and access to its resources as a critical intersection between the physical and cultural environment of human societies. This thesis traces the evolution of forest management from these medieval legacies throughout the early modern period where global demands and social change initiate pivotal transformations in forest management in Europe and in the "New World," leading to the devaluation of medieval practices. In doing so, this thesis identifies areas upon which historical perspectives inclusive of medieval legacies can address key issues regarding sustainability in modern Canadian forestry.

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## PROLOGUE

with every tree planted in the ground  
I mourned the loss of life that I had found  
across luscious lands torn apart  
I came to realize with a solemn heart  
that the fruits of my labour  
were only intended to produce paper  
I hope that my grand forest will grow tall  
rather than face its destiny to fall

Vankooten, Nicole. 2022. "Plant More Trees." In *Nymphalidae*, 3. Bookleaf Publish

## 1.0 Introduction

Forests were and are a vital global resource to sustain the needs of a growing human population. Canada is a global provider of many forest products used in modern daily life, ranging from timber, paper, cardboard and more. According to the Ministry of Natural Resources (MNR), Canadian management practices and laws are “among the strictest in the world.”<sup>1</sup> Some scholars, however, criticize current forest governance models, which focus on achieving sustainability without providing a clear definition or pathway forward.<sup>2</sup> Studies across the pure sciences, social sciences, and humanities are opening discussions on the effectiveness of commercial reforestation practices, which supposedly offer a sustainable solution to anthropogenic deforestation.

Environmental history is an emerging area of study that began in the mid-twentieth century and that aims to foreground nature within historical narratives. Interdisciplinary studies of forestry explore unique solutions and progress toward more sustainable management practices, including historical perspectives. The legacies that continue to shape forestry in its current state are more deeply rooted in the past than is initially apparent. Much of the current research surrounding Canadian forest history, thus, tends to begin with the arrival of European colonizers to North America, while excluding the influences of older medieval foundations and indeed the forest management practices of Indigenous peoples. To avoid the exclusion of these older, medieval foundations, environmental history perspectives must be implemented into forest

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<sup>1</sup> Natural Resources Canada. “Canada’s Forest Laws.” *Natural Resources Canada*, 2025. <https://natural-resources.canada.ca/forest-forestry/sustainable-forest-management/canada-s-forest-laws>

<sup>2</sup> Fuss, Gillian E., Steenberg, James W.N., Weber, Marian L., Smith, Peggy & Creed, Irina F. 2019. “Governance as a driver of change in the Canadian boreal zone.” *Environmental Reviews* 27(3): 318-332.

management practices for the socioeconomic and ecological sustainability of Canadian forests. Canada can adapt current practices to become more ecologically responsible by learning from the traditional management practices, public land ownership, and forest governance legacies from medieval England and tracing their colonial evolutions to the modern day.

During the British springtime and within forest landscapes, clusters of young trees appear prominently, nestled within a ground layer of dense bluebells. These new saplings are not coincidental, but rather the result of a traditional woodland management technique passed down from the medieval period, coppicing. Coppicing takes advantage of natural ecological succession to regenerate the forest where the stumps of felled broad-leaf trees are left intact to encourage new shoots to grow out of them, and to create these “clusters” of young trees.<sup>3</sup> Using successive harvests cycles that range from every ten to thirty years, the forest floor is exposed to light. This promotes tree growth in addition to other plants such as grass, flowers, and shrubs.

Upon further investigation, this traditional management practice is not so far removed from Canadian forest history. Canadian forest history is dominated by images of lumberjacks, conifer trees, and river drives. A walk through a managed Canadian woodland might present straight rows of coniferous trees atop a mossy forest floor covered in needles and various small plants. Promising emerging management practices reminiscent of these traditional woodland management techniques are, however, slowly gaining recognition from the forest industry. Some organizations are adopting alternative logging methods that aim to provide the forest floor with more light to encourage ecological succession and natural regeneration for a more diverse forest. In essence, this achieves a similar regenerative outcome to older European coppicing techniques. This thesis explores the ways in which alternative harvesting methods to clear-cutting emulate

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<sup>3</sup> Rackham, Oliver. 2001. *Trees and Woodlands in the British Landscape: The Complete History of Britain's Trees, Woods & Hedgerows*. London: Phoenix Press: 19.

their forgotten medieval history. In so doing, it argues for the importance of environmental historical awareness to promote the future of sustainable Canadian natural resource management.

### ***1.1 Methodology***

This thesis adapts the Pfister method to explore the medieval legacies of modern Canadian forestry practices. The Pfister method, taking its name from historical climatologist Christian Pfister, is a practice by which the historian simultaneously reads a combination of scientific and historical sources for an interdisciplinary perspective on a given subject.<sup>4</sup> This method has been particularly adapted and well used by environmental historians who recognize the value of interdisciplinary methodologies. Unlike traditional interdisciplinarity within the humanities and social sciences, environmental historians simultaneously draw on methods from the physical sciences and read them against evidence traditionally restricted to the more liberal arts. For example, environmental historians might read data collected from or preserved in the physical environment, called proxy data, as evidence gathered from nature against written chronicle records. The examination of medieval legacies in modern Canadian forestry practices presents the opportunity to consult a wide variety of sources from both the sciences and historical written sources.

Wolfgang Behringer outlines succinctly the sources and methods that are characteristic of the Pfister method. He distinguishes two broad data sets: those of the “archive of planet Earth,” and those preserved within the “archive of society.”<sup>5</sup> Within the archive of planet Earth, he describes the various scientific data sets that use evidence found in nature to arrive at scientific

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<sup>4</sup> Hoffmann, Richard C. 2008. "Homo et Natura, Homo in Natura: Ecological Perspectives on the European Middle Ages," in Barbara A. Hanawalt and Lisa J. Kiser, eds., *Engaging with Nature. Essays on the Natural World in Medieval and Early Modern Europe*, 11-38. Notre Dame, Indiana: University of Notre Dame Press, 15.

<sup>5</sup> Behringer, Wolfgang. 2016. *A Cultural History of Climate*. Cambridge; Malden: Polity Press, 8, 12.

conclusions about past climatic conditions.<sup>6</sup> Dendrochronology, the study of tree rings, is one example of proxy data from this archive. The idea to use tree rings as a source of proxy data can be credited to Andrew Ellicot Douglass, when, in 1901, he connected tree rings to their food supply, which is heavily influenced by precipitation and climate.<sup>7</sup> This premise allowed Douglass to build the initial foundations of cross-dating in which he used growth curves to determine the age of trees, and which he then applied to the study of history by coinciding dates of tree rings with dates of past weather events.<sup>8</sup>

There are various techniques applicable to the study tree rings. The widths of tree ring patterns can indicate natural events, such as earthquakes, due to growth disturbances.<sup>9</sup> Growth suppression in the patterns of tree rings can equally point to disturbances within forest composition.<sup>10</sup> Calibration is the technical term for the process of reconstructing historical climate fluctuations based on variations in tree-ring growth using a statistical model of growth-environment relationships.<sup>11</sup> It is important to note that even among scientific researchers, dendrochronology does not provide complete accuracy. It requires the skillful method of hypothesis-testing and picking out information from the rings that is most applicable to the hypothesis, therefore limiting the data only to what the tree rings can provide to the researcher.<sup>12</sup> Additional sources of proxy data like palynology, study of pollen deposits, can further supplement missing or incomplete data to provide a more accurate reconstruction of past climates.

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<sup>6</sup> Behringer, *A Cultural History of Climate*, 8-9.

<sup>7</sup> Cook, E. R., and Leonardas Kairiūkštis, eds. 1992. *Methods of Dendrochronology: Applications in the Environmental Sciences*. 1st ed. 1990. Dordrecht: Springer-Science+Business Media, 1.

<sup>8</sup> Cook & Kairiūkštis, *Methods of Dendrochronology*, 2.

<sup>9</sup> Cook & Kairiūkštis, *Methods of Dendrochronology*, 97.

<sup>10</sup> Cook & Kairiūkštis, *Methods of Dendrochronology*, 97.

<sup>11</sup> Cook & Kairiūkštis, *Methods of Dendrochronology*, 163.

<sup>12</sup> Cook & Kairiūkštis, *Methods of Dendrochronology*, 163.

In contrast, the archive of society, as Behringer termed it, examines extant written records to gain insights into the cultural aspects of environmental history. This technique fills in gaps left from physical proxy data sets. Behringer highlights that many written records were preserved by state authorities or religious institutions.<sup>13</sup> Such documentary records often included human demographic insights, focusing, for example, on births, deaths, or marriages. They equally often contain evidence of major economic trends, as with records conserving the historical fluctuations of grain prices.<sup>14</sup> Some surviving records are more personal, such as chronicles or clay tablets from monasteries that detail weather patterns and harvest progress.<sup>15</sup> Geoffrey Parker, in his essay “The Global Crisis of the 17th Century Reconsidered,” further divides the “human archive” into four distinct sub-categories; narrative, numerical, pictorial, archaeological.<sup>16</sup> The narrative category includes written records like texts whereas the numerical category describes documentary data such as demographic data discussed earlier.<sup>17</sup> Parker highlights two other important sources within the human archive: pictorial evidence, including visual sources like art and archeology, and epigraphic, carved inscriptions, such as those found on clay tablets.<sup>18</sup>

From within this “archive of society,” this thesis gives primacy to legislation. It is the primary evidence I use here to analyze the emergence of forest governance in late medieval English society. After all, as Carolyn Harris, author of *Magna Carta and its Gifts to Canada*, noted, the medieval English *Forest Charter of 1217* was the precedent “for public access to crown land and for common stewardship of shared resources throughout the English-speaking

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<sup>13</sup> Behringer, *A Cultural History of Climate*, 12.

<sup>14</sup> Flinn, M. 1981. *The European Demographic System, 1500-1820*. Baltimore.

<sup>15</sup> Behringer, *A Cultural History of Climate*,

<sup>16</sup> Parker, Geoffrey. “Crisis and Catastrophe: The Global Crisis of the Seventeenth Century Reconsidered,” *American Historical Review*, 113:4 (October 2008): 1067.

<sup>17</sup> Parker, “Crisis and Catastrophe,” 1067.

<sup>18</sup> Parker, “Crisis and Catastrophe,” 1067.

world, including Canada, that continue to the present day.” Crown land is key to modern Canadian forestry including sites for commercial logging through a tenureship agreement between governments and industrial organizations. It is important to note that this thesis uses the translated version of the *Forest Charter* due to the author’s acknowledged limited understanding of the Latin language and paleographic skills to read the handwriting used in the original document. The translated version, moreover, is digitally accessible.

To analyze the evolution of forest governance, I compare the charter to similar monumental pieces of forest and public land legislation. The *Inclosure Act* of 1773, thus, laid foundations for British land ownership and rights to common land. The Canadian *Crown Timber Act*, also known as An Act for the Sale and better Management of Timber upon the Public Lands, was decreed on May 30th, 1849, in efforts to control logging practices on Crown land through licenses granted by the government. I selected these legislative acts as they represent control over forest resources within a fixed period and thus helps to trace the evolution of Canadian forest governance. These legislative acts moreover touch upon overlapping themes of property ownership, forest resources and products, and sustainability. It is rare for historians and scientists to place the *Forest Charter* within an evolutionary timeline of Canadian forest governance.

## ***1.2 Theoretical Approaches***

Due to the interdisciplinary nature of this thesis, I apply various theoretical approaches to the subject of medieval legacies in Canadian forestry. The concept of interconnectedness between nature and culture is highlighted by Richard Hoffman’s Interaction Model, a response to the pre-existing models of Environmental Determinism and Constructivism. Environmental Determinism asserts that nature exists not in the background of history but as a dominating force

in human organization.<sup>19</sup> On the other hand, Environmental Constructivism examines the ways in which culture organizes society and its values in relation to their environment.<sup>20</sup> The Interaction Model aims to interweave these ideas to highlight the dynamism that exists between society and the environment, and has throughout history.<sup>21</sup> It emphasizes the interrelationship of the physical environment and material culture through the process of coevolution, where environments colonized by humans are never completely anthropogenic and nature is an active agent of history.<sup>22</sup> Hoffman also explores the concept of sustainability through the lens of the Interaction Model. He describes sustainability as a dynamic equilibrium between the needs or demands of human society and the ability of a natural system to support them.<sup>23</sup> This model will be used throughout this paper to demonstrate the continuity and change that exists across these periods of history within the dynamic relationship between human society and the forest.

Sections 1.2.1 and 1.2.2 cover theories that are primarily found in natural resource management literature and that intersect with other studies such as commerce, science, and the humanities. There are many theories and models surrounding research in natural resources, but these have specifically been selected for their relevance to the ideas and data presented in this research. Section 1.2.3 focuses on a theory often cited by environmental historians in their own studies involving natural resources while the final section will feature a more recent theory about sustainability and human society. These theories, when used in tandem or in comparison with each other, will provide a basis for understanding the wide scope of social and environmental themes addressed in this research.

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<sup>19</sup> Hoffmann, Richard. *An Environmental History of Medieval Europe*. Cambridge, United Kingdom: Cambridge University Press, 2014, 6.

<sup>20</sup> Hoffmann. *An Environmental History of Medieval Europe*, 7.

<sup>21</sup> Hoffmann. *An Environmental History of Medieval Europe*, 10.

<sup>22</sup> Hoffmann. *An Environmental History of Medieval Europe*, 10.

<sup>23</sup> Hoffmann. *An Environmental History of Medieval Europe*, 13.

### 1.2.1 Rational Policy Analysis

Rational Policy analysis is a policy theory based on the assumption of pursuing the course of action with the highest return and lowest cost on an individual or collective basis.<sup>24</sup> Neither the individual nor collective level are unproblematic. At the individual level, choices made for individual benefit may have consequences for other people that can range from unfavourable to harmful.<sup>25</sup> Some scholars have adapted the rational policy theory to argue that individuals, such as political figures, are in unique positions to problem solve collaboratively using expertise knowledge to form policies out of rational deliberation.<sup>26</sup> However, many find that this theory lacks the breadth to properly include the complexities of societal pressures and values that motivate “rational choice.”

It is often difficult to apply this theory to more recent studies in the humanities for this reason as it reduces the importance of social institutions in these choices.<sup>27</sup> In fact, the theory is derived from neoclassical understandings of microeconomics rooted in optimization for the producer and consumer.<sup>28</sup> However, rational policy theory does have influence in forestry and natural resource management. In many studies of unequal access to forests rational policy theories or its derivatives are used to examine the dynamics between the “oppressed” and the “oppressors” in terms of forest resources.<sup>29</sup>

I primarily deploy rational theory in this thesis while respecting the aforementioned limitations in Part One: Medieval Forest Exploitation and Management in a time period where

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<sup>24</sup> Arts, Bas. 2010. “Forests policy analysis and theory use: Overview and trends.” *Forest Policy and Economics*, 16, 9.

<sup>25</sup> Arts, “Forests policy analysis and theory use,” 9.

<sup>26</sup> Arts, “Forests policy analysis and theory use,” 9.

<sup>27</sup> Zafirovski, Milan. 2003. “The Rational Choice Approach to Human Studies: A Reexamination.” *Human Studies* 26, no.1 (2003): 42.

<sup>28</sup> Zafirovski, “The Rational Choice Approach to Human Studies,” 43.

<sup>29</sup> Arts, “Forests policy analysis and theory use,” 9.

social structures and institutions were certainly influential in almost every aspect of daily life, but much less developed than in later periods. Here, rational Policy Analysis is particularly useful in analyzing the motivations behind the Forest Charter of 1217, and in discerning the social problems leading up to its establishment in England.

### 1.2.2 Institutional Policy Analysis

To ensure the importance of social structures and their influence on choices regarding natural resources, I apply institutional policy theory to address the shortcomings of the rational policy analysis and the medieval feudal system of natural resource management. This theory builds on the foundations of rational choice and expands on them to argue that these choices are influenced by institutional norms rather than solely high return.<sup>30</sup> In doing so, institutional policy analysis allows scholars to consider social pressures aside from economics that motivate choices such as education, politics, and emotions.<sup>31</sup> Some scholars who have used institutional policy analysis adapt a subcategory of this theory called “historical institutionalism” which delves into the evolution of social institutions throughout history and the role of culture in choice.<sup>32</sup> Institutional policy analysis is a theory that is becoming better established among studies in forestry policy and that provides a more interdisciplinary theoretical approach to natural resource management research.<sup>33</sup>

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<sup>30</sup> Arts, “Forests policy analysis and theory use,” 9.

<sup>31</sup> Zafirovski. “The Rational Choice Approach,” 54.

<sup>32</sup> Zafirovski. “The Rational Choice Approach,” 9.

<sup>33</sup> Zafirovski. “The Rational Choice Approach,” 12.

Institutional policy analysis also allows for engagement between policy making and the values reflected in those policies.<sup>34</sup> By taking a broad social scope, the background context behind institutional procedures can be examined as a dynamic relationship.<sup>35</sup> Looking at the feedback provided by the public can identify misrepresentations or failures of institutions to properly reflect their social values.<sup>36</sup> To analyze the legacies of medieval forestry in modern Canadian management practices, this theory will primarily be used in Part 2: Transformations in Forestry and the Early Modern World. The institutional policy theory will examine the increasing roles of social structures in natural resource management, especially with colonial expansion into North America. This can be compared to the medieval management practices and the institutions in place in that time using the subcategory of historical institutionalism to trace its evolution between these periods.

### 1.2.3 Green Economies Theory

Finally, Green Economies Theory has dominated sustainability discourses, since its proposal in 2005 at the Fifth Ministerial Conference on Environment and Development. The United Nations Environment Programme subsequently adopted the approach.<sup>37</sup> This theory is based on the concept of valuing ecosystem services in market terms.<sup>38</sup> Ecosystem services are the benefits that an ecosystem, including forests, provide to humans according to: provisioning

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<sup>34</sup> West, William F. 2004. "Formal Procedures, Informal Processes, Accountability, and Responsiveness in Bureaucratic Policy Making: An Institutional Policy Analysis." *Public Administration Review* 64 (1), 67.

<sup>35</sup> West, "Formal Procedures, Informal Processes, Accountability and Responsiveness," 68.

<sup>36</sup> West, "Formal Procedures, Informal Processes, Accountability and Responsiveness," 73.

<sup>37</sup> Chang, Rui-Dong, Zuo, Jian, Zhao, Zhen-Yu, Zillante, George, Gan, Xiao-Long & Soebarto, Veronica. 2017. "Evolving theories of sustainability and firms: History, future directions and implications for renewable energy research." *Renewable and Sustainable Energy Review*, 72, 51-52.

<sup>38</sup> Chang et al., "Evolving theories of sustainability and firms," 52.

services, regulating services, supporting services, and cultural services.<sup>39</sup> Provisioning services include survival necessities like shelter and subsistence while regulating services cover other important factors such as climate.<sup>40</sup> Furthermore, supporting services are the less obvious benefits such as soil fertility and other chemical processes.<sup>41</sup> Cultural services are the more human-centric values such as recreation and aesthetic appeal.<sup>42</sup>

Forests provide many significant ecosystem services. To name only a few, these services range from industrial forest products (ie. timber), removal of greenhouse gas effects, reduction of soil erosion, habitats for pollinators, and beauty. These ecosystem services provided by forests have supplied human societies since the dawn of our existence and continue to do so. Medieval societies also enjoyed and exploited forests for these ecosystem services which require study. Many of their methods of obtaining these services from the forest continue to influence modern forestry practices. The Green Economics theory argues to place a much higher value on these ecosystem services than many countries currently do by recognizing the inability of modern society to separate sustainability and the economy.<sup>43</sup> By doing so, the needs of human societies are still at the forefront of the discussion while also recognizing the importance of maintaining healthy ecosystems for our own well-being.

Studying the Green Economics theory and ecosystem services is essential for understanding the medieval legacies of modern Canadian forestry. Policymaking according to the Green Economics theory should target prominent areas such as institutions, behaviour,

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<sup>39</sup> Niesenbaum, Richard A. 2019. "The Integration of Conservation, Biodiversity, and Sustainability," *Sustainability* 11, (17): 5.

<sup>40</sup> Niesenbaum, "The Integration of Conservation, Biodiversity, and Sustainability," 5.

<sup>41</sup> Niesenbaum, "The Integration of Conservation, Biodiversity, and Sustainability," 5.

<sup>42</sup> Niesenbaum, "The Integration of Conservation, Biodiversity, and Sustainability," 5.

<sup>43</sup> Chang et al., "Evolving theories of sustainability and firms," 52.

education, agriculture and infrastructure in addition to ecosystem services.<sup>44</sup> All of these targets can be examined in the medieval context as well as the modern. It is important to note that though the term “sustainability” and “ecosystem service” would not have been known to medieval society, the concept existed in their forestry practices, as will be discussed. It is therefore crucial for interdisciplinary studies like this one to approach environmental issues from a historical perspective to trace the evolution of our management practices that are so clearly failing us and our ecosystems. The Green Economics theory will be discussed in Part 3: Historical Legacies in Modern Forestry for its valuable insights into the dynamic relationship between humans and nature.

### *1.3 Temporal and Spatial Parameters*

This thesis adopts unusually broad temporal and spatial parameters, setting it in contrast to most others. Indeed, many historians tend to adopt narrower temporal and spatial parameters to become experts in a small area of history, in a specific place, at a specific time. Some go so far as to defend the need for microhistorical analysis, looking only to one illustrative case study from a particular historical “moment.” While there can be many advantages to focused approaches, for the purposes of this research a broader scope is advantageous. I recognize that my decision to tackle multiple time periods in two different geographic locations may be seen as problematic by some scholars. Under the current circumstances of ecological crisis and globalization, however, a macrohistory approach is entirely necessary. Macrohistory is gaining popularity as it calls for “more humanistic and ecological globalism” in academic settings to

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<sup>44</sup> Chang et al., “Evolving theories of sustainability and firms,” 52.

avoid biased perspectives and include non-traditional approaches to research.<sup>45</sup> It also encourages interdisciplinary work to tackle macrohistory and understand the various perspectives on global issues, such as forest management.<sup>46</sup> The long durée is an approach to macrohistorical writing that originated from the French scholar Fernand Braudel that covers a period over a long duration. More recently, however, historians using the long durée approach are transcending both time and space using “transnational” and “transtemporal history”.<sup>47</sup> Transtemporal histories are beneficial to “stress elements of linkage and comparison across time.”<sup>48</sup>

I chose the geographic locations of Canada and England for their intertwined histories of colonization, which continue to influence nearly every aspect of Canadian society today, including natural resource management. Indigenous forest management practices and various attitudes they held towards the environment will be included to give a more diverse perspective on the existing legacies from their culture and traditional ecological knowledge. My focus will be, however, the legacies of English practices and attitudes, due to their colonial erasure of Indigenous forestry, a necessary point of study in Canada’s forest history. France colonial influence also played its part. The French certainly had their own forestry practices that imported into Canada in their own colonial enterprises. While it no doubt played an important role in Lower Canada, constraints of time and space prevent a comparative analysis of the analogous French context in this MA thesis. To build on this research in the future, it would be greatly beneficial to include more representation of Indigenous and French influences.

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<sup>45</sup> Rodrigue, Barry H. 2011. “The Evolution of Macro-History in the United States.” in *Evolution: A Big History Perspective*, edited by Leonid E. Grenin, Andrey V. Korotayev & Barry H. Rodrigue. Volgograd: ‘Uchitel’ Publishing House, 76.

<sup>46</sup> Rodrigue, “The Evolution of Macro-History in the United States,” 77.

<sup>47</sup> Armitage, David & Guldi, Jo. 2015. “The Return of the Long-Durée: An Anglo-American Perspective.” *Annales HSS*, 70(2), 15.

<sup>48</sup> Armitage, David. 2012. “What’s the Big Idea? Intellectual History and the Longue Durée.” *History of European Ideas* 38 (4), 498.

The timescale of this research is also quite vast, but remains consistent with the goals of a *long durée* approach to history through transtemporality. This research begins in the medieval period for several important reasons. This is not intended to diminish or ignore the presence of environmental exploitation that existed prior to the Middle Ages and there are certainly influences from the Classical periods that can be found in medieval natural resource management. However, the Forest Charter of 1217 represents a turning point in English forest governance and through the process of colonization also makes it a pivotal moment in Canadian forest history.

This research begins in the High Middle Ages, circa 1000 CE. The High Middle Ages were a period of significant attention to deforestation and a time when the English consciously addressed the need for forest governance. The Forest Charter of 1217 would not have come to fruition without the work of the Domesday Book compiled for William the Conqueror in 1086, including a great survey of English forest.<sup>49</sup> Hence, my study begins prior to the thirteenth century, when the Forest Charter was written. At times, I provide contextual information for events or data prior to 1000 CE, simply for clarity purposes. Since this research traces the evolution of medieval English forestry practices, there is no obvious “end” date. In fact, it could be argued that the end of this research is far yet in the future that will be concluded when Canadian forestry practices can reflect the ability to learn from its history and successfully improve upon its sustainability.

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<sup>49</sup> Aberth, John. 2013. *An Environmental History of the Middle Ages: The Crucible of Nature*. London ; New York: Routledge, 91.

## 2.0 Part One: Medieval Forest Exploitation and Management

The High Middle Ages represented a critical period in which human society could shape, and be shaped, by their physical environment. These ideas are reflected in the various interactions between medieval English society and their forest ecosystems. Economic and environmental historian Bruce Campbell urges scholars to reframe their historical narratives in consideration of “nature as historical protagonist.”<sup>50</sup> In this sense, Campbell places the environment as a key driver of historical recovery, change, and synthesis rather than solely human institutions and behaviour. Part One aims to analyze the role of the forest as a protagonist in medieval history through the diverse ways in which people perceived the forest and the broader physical environment surrounding them. The wide variety of uses of the forest can moreover demonstrate its role as a protagonist as it becomes abundantly clear how crucial its resources were in the survival of medieval English society.

The elaborate interactions between attitudes towards the forest and the uses of forest resources culminate in the management techniques prevalent in the medieval woods. Many of these practices are absent from public historical consciousness among modern Canadian understandings of forest history, replaced rather by narratives of environmental destruction and domination as a reflection of Canada’s early modern colonial past. Furthermore, forests and forest management were so significant to medieval English society that the beginnings of written environmental governance can be traced to this pivotal period with the establishment of the Forest Charter of 1217. These legacies of medieval attitudes towards nature, resource management, and forest governance will be explored in Part One to determine their role in the development of modern Canadian forestry in Parts Two and Three.

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<sup>50</sup> Campbell, Bruce M. S. 2010. “Nature as Historical Protagonist: Environment and Society in Pre-Industrial England.” *The Economic History Review*.

## 2.1 *Attitudes Towards Nature and the Forest*

David Herlihy's seminal article, "Attitudes Toward the Environment in Medieval Society" made an important early contribution to what was then the emerging field of environmental history. In it, the author distinguishes four sets of attitudes toward nature that existed in the medieval period and that persist today: eschatological, adversarial, collaborative, and recreational.

### 2.1.1 Eschatological Perceptions

The first category of attitudes was a less prevalent perspective that emphasized the presence of human destiny and the biblical End Times, hence "eschatological."<sup>51</sup> Eschatological attitudes towards the environment are heavily influenced by religious teachings and symbolism. Richard Hoffmann further emphasizes that this eschatological perspective was rooted in medieval notions of God's will and His determination in death, which many medievals connected to natural disasters, such as famine or floods, as evidence of the "material and temporal" limits of the world.<sup>52</sup>

In a time where commoners relied on religious authorities to interpret biblical teachings, many people relied on the Church to frame their own immediate perceptions of nature.<sup>53</sup> Anxiety about the end of the world, also known as the End Times, was high throughout Christendom. Early medieval theologians had warned of overexploitation and overpopulation, even as they cautioned about the approaching End Times.<sup>54</sup> Many believed that the "next world" after death was much more intimately connected with the physical Earth in which the boundary between the two was permeable. Eric Weiskott of Yale University puts forward the compelling argument that

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<sup>51</sup> Herlihy. "Attitudes Toward the Environment," 102.

<sup>52</sup> Hoffmann. *An Environmental History of Medieval Europe*, 94.

<sup>53</sup> Herlihy. "Attitudes Toward the Environment," 102.

<sup>54</sup> Herlihy. "Attitudes Toward the Environment," 103.

late-medieval literary figure Geoffrey Chaucer may have intentionally sought to criticize the foresters and broad land management systems of his period using the villainization of the yeoman in “The Friar’s Tale”.<sup>55</sup> Chaucer’s decision to villainize the yeoman using biblical imagery indicates broader societal attitudes toward the forest and its connections to religion. The villainization of the yeoman-in-disguise reflects the anxieties regarding environmental exploitation and the end times as Chaucer criticizes the profit-driven motivations of the yeoman by comparing them to the interests of the Devil.

### 2.1.2 Adversarial Paradigm

In contrast, Herlihy’s adversarial view places nature at a distance from humanity, for safety and out of fear and awe of divine power.<sup>56</sup> Adversarial attitudes about the environment, also shaped by religious and the social anxieties produced by Christian teachings, were prominent in the High medieval communities. They were often strongly tied to their immediate community due to fear of the wilderness in this period.<sup>57</sup> The “wilderness” was often a source of environmental anxiety in the Middle Ages. An interesting demographic pattern can be observed in the Middle Ages in which rural populations grouped themselves into clustered communities, forming “population islands.”<sup>58</sup> Between such communities sat expanses of relatively uninhabited land, or “wilderness”, that served as communicative and interactive barriers.<sup>59</sup>

For many medieval people, the cleared lands of their communities provided a sense of safety and security in comparison to the forest where they were outside of their comfort zone.<sup>60</sup>

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<sup>55</sup> Weiskott, Eric. “Chaucer the Forester:” *The Chaucer Review* 47, no. 3 (January 1, 2013), 324.

<sup>56</sup> Hoffmann. *An Environmental History of Medieval Europe*, 94-96.

<sup>57</sup> Herlihy. “Attitudes Toward the Environment,” 108.

<sup>58</sup> Herlihy. “Attitudes Toward the Environment,” 107.

<sup>59</sup> Herlihy. “Attitudes Toward the Environment,” 107-108.

<sup>60</sup> Fumagalli, “Landscapes of Fear,” 147.

As Herlihy highlights, the wilderness was often viewed as the opposite of an idyllic society, an uncivilized place, punishment.<sup>61</sup> The forest was a popular literary setting in for scenes of betrayal, trickery, and fantasy.<sup>62</sup> The thirteenth century saw great forests cleared to provide safe travel and concerns about the “malefactors” committing crimes and hiding out in them, including woodland creatures.<sup>63</sup> Forest animals were often seen as otherworldly and associated with the supernatural, such as the cynocephali monster based on the real-world characteristics of a wolf.<sup>64</sup> These connections to the supernatural heightened popular anxieties about nature and the forest. Many medieval scholars discussed and debated human’s place within the animal kingdom. Roger Bacon, for example, reiterated notions about the separation between humans and animals based on the capability of “knowledge and reason.”<sup>65</sup> Like the fears of the eschatological beliefs, anxieties about human society were often imposed on the environment and the forest came to be seen as a scapegoat for immorality or unwanted human behaviour.

### 2.1.3 Collaborative Paradigm

While many eschatological and adversarial beliefs persisted in the Medieval Period, broader societal changes influenced emerging collaborative attitudes towards the environment. Herlihy’s so-called collaborative attitude captures the medieval dynamism between humans and nature. In this paradigm, society and the environment shape one another, depending on their needs.<sup>66</sup> This paradigm addresses the expansion of human societies and accompanying

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<sup>61</sup> Herlihy. “Attitudes Toward the Environment,” 109.

<sup>62</sup> Weiskott, Eric. “Chaucer the Forester:” *The Chaucer Review* 47, no. 3 (January 1, 2013), 324.

<sup>63</sup> Aberth, *An Environmental History of the Middle Ages*, 131.

<sup>64</sup> Fumagalli, “Landscapes of Fear,” 11.

<sup>65</sup> Sobol, Peter G. 2019. “The Shadow of Reason: Explanations of Intelligent Animal Behavior in the Thirteenth Century.” in *The Medieval World of Nature*, edited by Joyce E. Salisbury. New York: Routledge, 116.

<sup>66</sup> Herlihy. “Attitudes Toward the Environment,” 109.

population growth that transform eschatological and adversarial dynamics into more triumphant medieval views of ecosystems for human benefit.

A key phenomenon occurring in the High Middle Ages was the growth of urban centers after years of decline and stagnation in the earlier part of the medieval period, which reinstated long-distance trade.<sup>67</sup> Collaborative attitudes developed out of the increasingly blurred boundaries between humans and wilderness in the urban centers toward the end of the medieval period. The High Middle Ages saw growth in the European population which turned the attention of urban centers to the surrounding landscapes that could be exploited for natural resources and subsistence needs, such as clearing the forests for agriculture.<sup>68</sup> An interesting urban-rural divide began to form, establishing a “sense of superiority over the country.”<sup>69</sup> For some of the more privileged social positions in medieval society, exploitation of the environment was becoming more accessible and less feared as the notion of taming nature was popularized.<sup>70</sup>

The forest clearances of the High Middle Ages began to infiltrate the frontiers of the wilderness to improve agricultural productivity.<sup>71</sup> Expansionist attitudes and behaviour brought human society and the environment together into evolving dynamic relationships. Many fears and anxieties of the wilderness persisted until the end of the Middle Ages. I will analyze the uses of the medieval forest in Part 2.3, but it is first necessary to examine the motivations and values that influenced perceptions of the forest and its resources. A common collaborative belief envisioned “a nature where humans cooperated to advance Creation” that included taming the forest wilderness to settle its disorder.<sup>72</sup> Nature was often seen in terms of its resources for

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<sup>67</sup> Herlihy. “Attitudes Toward the Environment,” 109.

<sup>68</sup> Fumagalli, “Landscapes of Fear,” 68.

<sup>69</sup> Fumagalli, “Landscapes of Fear,” 68.

<sup>70</sup> Aberth, *An Environmental History of the Middle Ages*, 24.

<sup>71</sup> Fumagalli, “Landscapes of Fear,” 68,103.

<sup>72</sup> Hoffmann. *An Environmental History of Medieval Europe*, 103-104.

humans to manipulate and make things out of to meet the needs of society.<sup>73</sup> In this sense, the environment could be seen as malleable to human ingenuity and domination.

A prominent example of this attitude can be seen in the interactions between humans and wolf populations in the thirteenth century. As mentioned, wolves and other forest animals were often highly feared and villainized in medieval society. When humans converted forested woodlands to arable, they shrank the natural habitat of wolf populations, bringing the wolves closer to the villages and countryside for food.<sup>74</sup> Wolves became ritualistically and persistently hunted out of response to this phenomenon.<sup>75</sup>

Historians have criticized and debunked Lynn White Jr.'s early argument that the Christian doctrine of dominion, from Genesis, forms the roots of modern environmental problems. White's assumptions about medieval religious perceptions of the environment were flawed and only tenuously indicative of common people's attitudes toward nature. A deeper exploration of religion and perceptions of the environment highlights a less straightforward conclusion than that published by White. Medieval philosophers thus debated whether trees could feel pain when felled, whether they had souls, and whether or how they fit within the animal kingdom.<sup>76</sup> A popular notion held that plants, including trees, could not contain a complete soul like humans and other animals.<sup>77</sup> Herlihy highlights triumphalist attitudes emerging in the medieval period were not so much linked to biblical teachings, as Lynn White Jr. had asserted, but rather developed in a time of an expanding society that pushed the physical and cultural boundaries of their past communities.<sup>78</sup>

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<sup>73</sup> Herlihy. "Attitudes Toward the Environment," 112.

<sup>74</sup> Fumagalli, "Landscapes of Fear," 147.

<sup>75</sup> Fumagalli, "Landscapes of Fear," 147.

<sup>76</sup> Aberth, *An Environmental History of the Middle Ages*, 133-134.

<sup>77</sup> Aberth, *An Environmental History of the Middle Ages*, 134.

<sup>78</sup> Herlihy. "Attitudes Toward the Environment," 112.

#### 2.1.4 Recreational

Herlihy's recreational attitude more optimistically casts nature as a means of "psychological and spiritual fulfillment," in that it allowed medieval people to escape the norms and hardships of medieval society and enjoy natural aesthetic beauty.<sup>79</sup> Hunting was a common recreational activity among medieval elites that projected wealth and power.<sup>80</sup> The royal forests of medieval England served a primary role in housing the game animals for sport hunting, forbidding others from hunting the animals or felling the trees within it.<sup>81</sup> The forest was seen as a place for recreational hunting for elites, but the setting was still highly controlled by human collaborative attitudes through the manipulation of game animal populations

The forest also provided spiritual fulfillment. Religious communities, such as monasteries, used the forest as a place of isolation to test the strength of their faith, similar to the biblical teachings of the desert fathers.<sup>82</sup> Royal and noble charters often granted forested land to monasteries, both to meet subsistence and spiritual needs.<sup>83</sup> It is important to note, however, that much of the forest on monastic properties was also highly maintained by its inhabitants and not left in its natural state. Gardening was a popular recreational activity among religious communities, both for practical (dietary, medicinal) and aesthetic purposes. For many, gardening was often carried out to create a sacred, Paradise-like setting in opposition to the surrounding wilderness.<sup>84</sup> Gardening allowed people of the upper and ecclesiastical classes to connect with nature through recreation and appreciation of beauty despite its human construction and maintenance.

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<sup>79</sup> Herlihy. "Attitudes Toward the Environment," 112.

<sup>80</sup> Thomas T. Allsen. 2006. *The Royal Hunt in Eurasian History*. Philadelphia: U Penn Pr., 8-9.

<sup>81</sup> Aberth, *An Environmental History of the Middle Ages*, 98.

<sup>82</sup> Weiskott. "Chaucer the Forester:" 128.

<sup>83</sup> Aberth, *An Environmental History of the Middle Ages*, 90-91.

<sup>84</sup> Hoffmann. *An Environmental History of Medieval Europe*, 103.

Attitudes toward nature and the forest were, therefore, diverse and evolving in the medieval Period. The High Middle Ages as a time of continuity and change is reflected in the many perceptions of the environment, ranging from fear to divine will and authority to enjoyment. The forest was central to many of these ideas and these attitudes influenced the many motivations behind medieval forest exploitations and management practices, as will be explored further when examining the uses of the forest.

## **2.2 Medieval Uses of the Forest**

Forests existed not simply as fodder for human imagination and as symbols, but as key sources of human sustenance. They were the “lifeblood” of the medieval economy, as Micheal Williams stated in his *Deforesting the Earth*.<sup>85</sup> The uses of the forest were vast as European populations expanded into the High Middle Ages. Forests were exploited for their physical resources as well as the land they occupied. In his book *Man and the Natural World*, social and cultural historian Keith Thomas asks, “for how had civilization progressed if not by the clearance of the forests, the cultivation of the soil and the conversion of wild landscape into human settlement?”<sup>86</sup> It is valuable to reflect on this idea by applying the Interaction Model when examining the medieval uses of the forest.

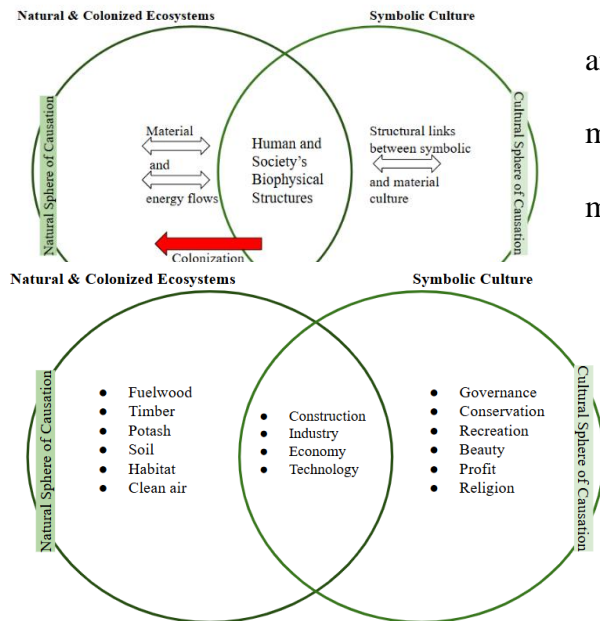
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<sup>85</sup> Williams, Michael. *Deforesting the Earth*. Chicago, United States of America: The University of Chicago Press, 2003, 136.

<sup>86</sup> Thomas, Keith. 2008. *Man and the Natural World : Changing Attitudes in England 1500-1800*. Charlesbourg, Québec: Braille Jymico Inc, 27.

Richard Hoffmann proposed an elegant diagram (Figure 1.1) to represent how natural and colonized ecosystems co-exist at the juxtaposition of symbolic culture and natural / colonized ecosystems.<sup>87</sup> Material and energy flows connect the biophysical structures to ecosystems, which in turn creates the one-way process of colonization that allows humans to benefit from the environment through exploitation. In contrast, symbolic culture represents man-

Figure 1: The Interaction Model: Biophysical Structures as Ecosystem Compartments. Adapted from Richard C. Hoffmann *An Environmental History of Medieval Europe* (2014), page 9.



made meanings, institutions, and structures that regulate a society. At the intersection lie human and society's biophysical structures that rely on or are derived from the environment that require man-made institutions and cultural values for effective management.

We can place this model in the context

of anthropogenic interactions with forest ecosystems (See Figure 2). Natural and colonized ecosystems hold various raw materials such as timber, soil, clean air, and vegetation. Humans then use these resources as materials to construct homes or energy to

Figure 2: The Interaction Model: Biophysical Structures as Ecosystem Compartments with forest-specific data. Adapted from Richard C. Hoffmann *An Environmental History of Medieval Europe* (2014), page 9.

supply a heat source. To regulate these material and energy flows, societies create symbolic structures to sustain their needs. This can include religious teachings, ideas of conservation, and governance which work to maintain the necessary biophysical structures within a given society.

<sup>87</sup> Hoffmann, "An Environmental History of Medieval Europe," 9.

### 2.2.1 Construction Timber

Wood was a vital resource used in nearly every aspect of medieval society. Beginning with wood provided for tenants for construction, *housebote*, forests provided the timber necessary for even humble dwellings. The same was true of boats, mills, and other grander construction projects.<sup>88</sup> For this thesis, I focus my analysis of construction on vernacular buildings to determine common uses for timber. In the earlier medieval period, cheaper building materials replaced the more costly stone that was so prominent in Classical architecture.<sup>89</sup> There are several different methods that medieval people employed to convert felled trees into timber. “Boxed-heart timber”, also known as whole timber, was most common in the High Middle Ages and involved the process of converting an entire tree into a squared beam with the pith and heartwood in the center.<sup>90</sup> “Heart-sawn”, or halved, involved cutting the tree in half lengthwise to create thinner pieces of timber.<sup>91</sup> Less popular was the process of quartering a tree for the smaller materials in which four pieces of timber were extracted from a single tree.<sup>92</sup> Some strong continuities exist across all medieval timber construction regardless of conversion method. Oak was the preferred species used for most construction projects, especially buildings like houses, alongside elm, beech, and birch.<sup>93</sup> The size and age of a tree were an important factor when felling for construction timber. Younger, smaller oaks ranging from 25 to 70 years old were predominantly used in vernacular buildings. Dendrochronologists researching vernacular

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<sup>88</sup> Williams. *Deforesting the Earth*, 132.

<sup>89</sup> Cheyette, Frederic L. 2008. “The disappearance of the ancient landscape and the climatic anomaly of the early Middle Ages: a question to be pursued,” *Early Medieval Europe*, 143.

<sup>90</sup> Alcock, Nat, and Dan Miles. 2013. *The Medieval Peasant House in Midland England*. Oxford: Oxbow Books, 79.

<sup>91</sup> Alcock & Miles, *The Medieval Peasant House*, 79.

<sup>92</sup> Alcock & Miles, *The Medieval Peasant House*, 79.

<sup>93</sup> Alcock & Miles, *The Medieval Peasant House*, 12, 94.

architecture can often find timber with as little as 25 annual tree rings, thereby highlighting the use of juvenile trees for construction.<sup>94</sup>

The medieval peasant house is an excellent case study of the use of the forest for timber. Various research projects across disciplines such as architecture, archeology, dendrochronology, and history highlight the construction process using timber as the main building material. The cruck structural form is one of many architectural patterns in medieval building construction but was most common amongst the peasantry, whereas Wealden buildings or hall houses were often reserved for the wealthier yeomen in society.<sup>95</sup> Cruck houses, typically consisting of three bays and four trusses, were often wide and low as the trusses that provided support for the roof and walls generally measured thirteen to twenty-two feet wide and fifteen to twenty-eight feet high.<sup>96</sup> Trees to construct cruck houses were primarily converted using the “boxed-heart” technique of squaring whole logs to create the various structural pieces.<sup>97</sup> It is estimated that for the basic frame of a cruck house, 24 trees were required.<sup>98</sup> Halved timber was also present in cruck construction. The “heart-sawn” timber was essential to build the roof rafters which often featured the youngest trees at around 12 years of age.<sup>99</sup>

Number 1 Coppard’s Bridge in East Sussex, today preserved by Historic England and previously studied by woodland historian Oliver Rackham, is a medieval hall house that provides excellent insight into timber consumption in vernacular buildings. As a building slightly above the average dimensions, it also suggests interesting differences among social classes for the use

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<sup>94</sup> Rackham, “Grundle House,” 6.

<sup>95</sup> Alcock & Miles, *The Medieval Peasant House*, 3.

<sup>96</sup> Alcock & Miles, *The Medieval Peasant House*, 5, 47.

<sup>97</sup> Alcock & Miles, *The Medieval Peasant House*, 79-80.

<sup>98</sup> Alcock & Miles, *The Medieval Peasant House*, 109.

<sup>99</sup> Alcock & Miles, *The Medieval Peasant House*, 81.

of timber.<sup>100</sup> The house, whose oldest portions date from about 1475, is constructed entirely using oak. This involved about 143 trees, two-thirds of which were immature age trees, with the oldest timber aged 78 years, according to dendrochronological analysis.<sup>101</sup> Furthermore, this particular building exemplifies a specific pattern of construction that correlates with timber extraction from coppice woods. Rackham observed that coppices were often harvested for timber when branches reached twenty feet long, strikingly like the average width of larger medieval buildings such as the hall house.<sup>102</sup> Coppard's Bridge follows this pattern with the average timber length measuring nearly nineteen feet.<sup>103</sup>

It is important to note that evidence from dendrochronology and written records provides the general assumption that construction began shortly after the trees were felled as needed.<sup>104</sup> In many regions, housebote rights to collect timber wood from the local forest were granted to the peasantry.<sup>105</sup> However, these rights varied situationally across the country depending on the lord's discretion and/or local availability of the forest. For those living in areas of wood scarcity, timber markets in adjoining towns were able to supply their timber. Documented timber markets were found in the towns of Lutterworth, Stratford-upon-Avon, and Woodstock, for example.<sup>106</sup> Similarly in the north where it was more common to have a deforested village area, timber was often purchased and transported from nearby towns.<sup>107</sup>

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<sup>100</sup> Varlow, "From Trees to Timbers," 66.

<sup>101</sup> Varlow, "From Trees to Timbers," 75.

<sup>102</sup> Varlow, "From Trees to Timbers," 70-71.

<sup>103</sup> Varlow, "From Trees to Timbers," 71.

<sup>104</sup> Varlow, "From Trees to Timbers," 14.

<sup>105</sup> Varlow, "From Trees to Timbers," 106.

<sup>106</sup> Alcock & Miles, *The Medieval Peasant House*, 106.

<sup>107</sup> Rackham, "Grundle House," 7.

### 2.2.2 Firewood

Forests provided medieval people with wood for other purposes as well. *Firebote* was the wood that tenants collected from lord's lands as fuel and to feed various domestic and commercial heating needs. In the homes of medieval tenants, firewood was essential to heat the space and cook food using a variety of methods such as stone, brick, or ceramic hearths and fireplaces with a smoke ventilation system such as a chimney.<sup>108</sup> Dead, dry wood was preferred to the green wood of living trees or branches for its ability to ignite and burn easier.<sup>109</sup> In many cases, firewood was collected and subsequently stored to dry fully to burn better.<sup>110</sup> For the wealthier of medieval society, however, there was an alternative option to ensure a long-lasting fire that burned hot. Charcoal was an important forest product in medieval society that provided heat for the various trades and industries in England. Charcoal was commonly converted from the branch or stemwood of younger oak trees, but could also include the larger trunkwood of older trees.<sup>111</sup> The process of converting wood into charcoal in medieval society required limiting exposure to oxygen by covering the wood stack in soil and slowly burning it to create a carbon-rich substance that burned hot.<sup>112</sup> Alternatively, charcoal could be produced in holes made into the ground called "pit-steads" for a significantly lighter product while also providing more energy than wood in its natural state.<sup>113</sup>

Medieval industries took advantage of this carbonized state of firewood to fuel their furnaces. In a preindustrial world, wood and charcoal provided society with its main source of

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<sup>108</sup> Hoffmann, "An Environmental History of Medieval Europe," 200.

<sup>109</sup> Hoffmann, "An Environmental History of Medieval Europe," 201.

<sup>110</sup> Hoffmann, "An Environmental History of Medieval Europe," 201.

<sup>111</sup> Wheeler, Jane. 2011. "Charcoal Analysis of Industrial Fuelwood from Medieval and Early Modern Iron-Working Sites in Bilsdale and Rievaulx, North Yorkshire, UK: Evidence for Species Selection and Woodland Management." *Environmental Archaeology: The Journal of Human Palaeoecology* 16 (1): 34.

<sup>112</sup> Hoffmann, "An Environmental History of Medieval Europe," 201.

<sup>113</sup> Hoffmann, "An Environmental History of Medieval Europe," 201.

manufacturing heat energy.<sup>114</sup> Charcoal production can be seen as an industry in itself, with many forested areas such as the Forest of Dean, Rockingham Forest, and Brede High Woods supplying the various trades with charcoal.<sup>115</sup> Perhaps one of the largest consumers of charcoal was the metal-working industry, especially iron. It is estimated that to produce a ton of iron, 10 acres of timber were required to be able to stoke the furnaces.<sup>116</sup> The bloomery furnace, used from the 12th to 15th centuries, required intense heat from burning charcoal to create wrought iron from iron ore.<sup>117</sup>

Wood was a key energy source for many other industries. Glassmaking, for example, provides an insight into the diverse ways that the forest provided materials for the production of finished goods. In addition to using firewood to heat their furnaces for the actual fusion of the glass, glass-makers required potash (potassium carbonate) made from wood ash and water.<sup>118</sup> In total, a kilogram of glass required approximately between one and three cubed metres of wood, the majority in the production of potash.<sup>119</sup> Ceramics and pottery similarly relied on the forest for their respective industries. Wood-burning kilns often used smaller scraps of wood such as brushwood to fire the various pottery items and ceramics.<sup>120</sup> The wool industry also needed charcoal to heat the combs during the process of converting wool to a workable fibre material.<sup>121</sup>

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<sup>114</sup> Hoffmann, “An Environmental History of Medieval Europe,” 183.

<sup>115</sup> Hazell, Zoë, Vicky Crosby, Matthew Oakey, and Peter Marshall. 2017. “Archaeological Investigation and Charcoal Analysis of Charcoal Burning Platforms, Barbon, Cumbria, UK.” *Quaternary International* 458 (November): 180.

<sup>116</sup> Landers, John. 2003. *The Field and the Forge: Population, Production and Power in the Pre-Industrial West*, New York: Oxford University Press, 51.

<sup>117</sup> Wheeler, Jane. 2011. “Charcoal Analysis of Industrial Fuelwood from Medieval and Early Modern Iron-Working Sites in Bilsdale and Rievaulx, North Yorkshire, UK: Evidence for Species Selection and Woodland Management.” *Environmental Archaeology: The Journal of Human Palaeoecology* 16 (1):17.

<sup>118</sup> Hoffmann, “An Environmental History of Medieval Europe,” 225.

<sup>119</sup> Hoffmann, “An Environmental History of Medieval Europe,” 225.

<sup>120</sup> Cherry, John. 1991. “Pottery and Tile.” In *English Medieval Industries: Craftsmen, Techniques, Products*, edited by John Blair and Nigel Ramsay. London; Hambledon Press, 191, 203.

<sup>121</sup> Hazell et al. “Archaeological Investigation and Charcoal Analysis,” 195.

Heat would have been invaluable to wool spinners to help with straightening the material. While peat was a common fuel source where available, wood also fuelled the fires used in the salt industry to evaporate the water and leave the salt for human uses such as preservatives.<sup>122</sup>

### 2.2.3 Hunting

The medieval forest not only provided raw materials for heat and energy, it also provided animal habitats. It is important to note, however, that hunting was most frequently used in the medieval forest for recreation and leisure rather than subsistence. The king and the upper classes of medieval society used hunting as a means of sociability and power as part of their elite status.<sup>123</sup> Furthermore, hunting and establishing hunting grounds were also a method of territorial control.<sup>124</sup> Much of the forests covering the medieval English landscape through the establishment of royal forests had strict regulations of public access. Among these forests were the King's prized game animals, venison; red deer, fallow deer, and roe deer with the hunting season typically lasting from June to September exclusively in the hands of the monarchy.<sup>125</sup> These summer months provided the upper classes with the means of entertainment for their families and guests with private retreats centered around the hunt.<sup>126</sup> For younger members of royalty, hunting became a rite of passage taught by elder family members.<sup>127</sup>

The animals from the hunts intended to symbolize the hunter's wealth and status.

Venison was often served as food, gift, or reward among royalty.<sup>128</sup> Rabbits were additionally

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<sup>122</sup> Aberth, *An Environmental History of the Middle Ages*, 107.

<sup>123</sup> Hoffmann. *An Environmental History of Medieval Europe*, 190.

<sup>124</sup> Williams. *Deforesting the Earth*, 132.

<sup>125</sup> Hooke, Della, Dainis Dauksta, and Eva Ritter. 2011. "Royal Forests – Hunting and Other Forest Use in Medieval England." In *New Perspectives on People and Forests*, 41–59. Dordrecht: Springer Netherlands, 49, Mileson, Stephen. 2009. *Parks in Medieval England*. Oxford, United Kingdom: Oxford University Press, 24.

<sup>126</sup> White, G. J. 2012. *The Medieval English Landscape, 1000-1540*. London ; Bloomsbury Academic, 47.

<sup>127</sup> Mileson. *Parks in Medieval England*, 20.

<sup>128</sup> Hooke et al., "Royal Forests," 49.

hunted for their prized fur that could be used to line the garments of medieval upper-class people.<sup>129</sup> In rare events, the royal hunt could go as far as to bring exotic animals such as jackals, tigers, and reindeer to the forest, further exemplifying their status.<sup>130</sup> The ways in which these animals were hunted also deserve attention. A horseback hunter could chase its prey with the help of hunting dogs and commonly regarded as “the highest kind of sport.”<sup>131</sup> Another technique was to chase the animals towards the awaiting hunters with bows and arrows in stands within the forest.<sup>132</sup> Animals could also be chased towards nets or snares to be captured.<sup>133</sup>

#### 2.2.4 Agriculture

Forest management and agriculture are deeply intertwined, especially in the High Middle Ages with growing populations and new farming innovations. The Anglo-Saxon Period, from approximately the fifth to eleventh century, was an influential time in the agricultural intensification of the medieval English landscape with the conversion of forests to permanent arable fields for cereals such as wheat, rye, barley, and oats to feed the growing population.<sup>134</sup> Interestingly, the climatic phenomenon known as “The Medieval Climate Anomaly” (MCA) coincides with this period of agricultural expansion where the Northern Hemisphere saw above-average temperatures from approximately 950-1250 AD encouraging the opportunity for population growth.<sup>135</sup>

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<sup>129</sup> Hoffmann. *An Environmental History of Medieval Europe*, 189.

<sup>130</sup> Allsen. *The Royal Hunt in Eurasian History*, 9-100.

<sup>131</sup> Hooke et al., “Royal Forests,” 49.

<sup>132</sup> Hooke et al., “Royal Forests,” 49.

<sup>133</sup> Hooke et al., “Royal Forests,” 49.

<sup>134</sup> Hoffmann, “An Environmental History of Medieval Europe,” 83, 122, 133.

<sup>135</sup> Behringer, *A Cultural History of Climate*, 79-81. Williams, *Deforesting the Earth*, 76.

Researchers such as Michael E. Mann deploy scientific proxy data “to reconstruct large-scale trends in past centuries,” including the Middle Ages.<sup>136</sup> Mann and his research team compiled a network of proxy data from across the globe including ice cores, tree rings, coral, and sediment samples to create a surface temperature reconstruction of the Northern Hemisphere.<sup>137</sup> Their reconstruction models consistently suggest a period of warmer climate in the Northern Hemisphere, including England, starting in 950 AD before dropping off after 1250 AD.<sup>138</sup> Furthermore, Della Hooke and Simon Burnell describe landscape as a “result of interaction between natural resources and human modification,” in their book *Landscape and Settlement in Britain, AD 400-1066*.<sup>139</sup> They emphasize the fact that natural phenomena, such as climate change, can affect agricultural productivity for better or worse.<sup>140</sup>

Medieval society capitalized on the prosperity of a warmer climate through woodland conversion. Agricultural and manorial records indicate the innovative transition of the two-field crop rotation to three fields with the demand for cereal grains and animal-powered machinery to sustain the growing population.<sup>141</sup> By introducing a third field into the rotation, medieval farmers could produce winter grain and spring grain while leaving one field fallow to enrich the soil and increase their yields by upwards of 17%.<sup>142</sup> Winter crops, known as “maslin”, included rye and wheat while spring crops, or “dredge”, consisted of barley and oats.<sup>143</sup> These fields of 50 acres or

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<sup>136</sup> Mann, Michael E., et al. 2009. "Global Signatures and Dynamical Origins of the Little Ice Age and Medieval Climatic Anomaly," *Science* 326, no. 5957, 1256.

<sup>137</sup> Mann, “Global Signatures and Dynamical Origins,” 1257.

<sup>138</sup> Mann, “Global Signatures and Dynamical Origins,” 1256.

<sup>139</sup> Hooke, Della, and Simon Burnell. 1995. *Landscape and Settlement in Britain, AD 400-1066*. Exeter Studies in History, 11.

<sup>140</sup> Hooke & Burnell, *Landscape and Settlement*, 12.

<sup>141</sup> Hoffmann. *An Environmental History*, 125.

<sup>142</sup> Hoffmann. *An Environmental History*, 123.

<sup>143</sup> Woolgar, C M. 2006. *Food in Medieval England : Diet and Nutrition*. Oxford: Oxford University Press, 109.

more on average would be divided into narrow strips called furlongs which could be rotated annually.<sup>144</sup>

The emergence of the three-field crop rotation drove mass deforestation that characterized medieval environmental history. It is estimated that by the end of the thirteenth century, the English had harvested and converted four million hectares of woodland for arable.<sup>145</sup> Conversion of woodland to arable field was done by a process of tearing the trees from the ground, mass burning, and ploughing the open soil through assarting.<sup>146</sup> By the year 1086 AD, around the height of the MCA, England lost between one-third and two-thirds of its ancient forest cover according to historical records.<sup>147</sup> The English also drained wetlands to increase agricultural land, often to create pasture lands as settlements became more permanent and livestock lived close to the farmers.<sup>148</sup>

Woodland clearances and landscape transformation in the Medieval period were intended to sustain the needs of local populations.<sup>149</sup> At the time of the High Middle Ages, grain constituted the main source of calories for medieval society thus the landscape had to be adjusted for survival. The farmers of the Middle Ages were mostly clearing and cultivating to feed the immediate surrounding population rather than experiment with cash crops for profit.<sup>150</sup> Clearing woodland without cultivating the deforested land could deliver a sentence guilty of “waste”, subject to punishment by fine.<sup>151</sup>

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<sup>144</sup> White, G. J. 2012. *The Medieval English Landscape, 1000-1540*. London ; Bloomsbury Academic, 14.

<sup>145</sup> White, *The Medieval English Landscape*, 24.

<sup>146</sup> Hoffmann, Richard. *An Environmental History of Medieval Europe*, 121.

<sup>147</sup> Hoffmann, Richard. *An Environmental History of Medieval Europe*, 121.

<sup>148</sup> Hoffmann. *An Environmental History* 125.

<sup>149</sup> Hoffmann, Richard C. 2001. “Frontier Foods for Late Medieval Consumers: Culture, Economy, Ecology.” *Environment and History* 7 (2):131.

<sup>150</sup> White, *The Medieval English Landscape*, 26.

<sup>151</sup> White, *The Medieval English Landscape*, 40.

Beyond providing space for agricultural expansion, medieval forest ecosystems provided resources for humans to sustain their various agricultural practices. Forest “islands” remained on many medieval farms alongside the vast expanses of pasture and fields.<sup>152</sup> Pigs were one domesticated animal that survived well off the forest. Farmers who raised pigs used forests to feed them with the various plants and nuts available on the forest floor, often referred to as woodland pastures.<sup>153</sup> For many peasants, pork was a cheap way to add meat into their diet and it preserved well, so the forest was crucial to the survival of livestock and their owners.<sup>154</sup> These woodland pastures also provided sources of wood, as discussed, for fire or timber for construction.<sup>155</sup>

### **2.3 Management Practices and Sustainability**

The English forest underwent an exceptional transformation in the medieval period and began to create a landscape we could recognize from a modern perspective as early as 1200 AD.<sup>156</sup> Thus far the attitudes and uses of the forest have been explored. Popular understandings of medieval forestry conjure images of vast clearances, yet there is a much more complex system of forest management that remains widely misunderstood. Medieval England, as a pre-industrial society, survived based on the availability of renewable resources and managed them accordingly.<sup>157</sup>

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<sup>152</sup> Behringer, Wolfgang. *A Cultural History of Climate*, 80.

<sup>153</sup> Woolgar, *Food in Medieval England*, 77.

<sup>154</sup> Woolgar, *Food in Medieval England*, 77.

<sup>155</sup> White, *The Medieval English Landscape*, 42.

<sup>156</sup> Rackham, *Trees and Woodlands*, 39.

<sup>157</sup> Rackham, *Trees and Woodlands*, 62.

### 2.3.1 Harvesting Techniques

“Forestry” is typically associated with today’s cash-crop woodland plantations, but this does not mean that premodern society lacked management strategies.<sup>158</sup> Indeed, archeologists Robert Francis and Alexa Dufraisse emphasize that management practices tend to evolve alongside population demands.<sup>159</sup> Medieval timber and wood harvesting remained mostly a local operation based on estate or community demands. Woodsmanship, the term more properly



Figure 3: Coppice Stools in Three Stages to demonstrate the harvest cycle of a traditionally managed woodland.

associated with medieval forest management, relied on natural succession processes for reforestation, rather than, say, replanting trees by hand or by machine.<sup>160</sup> Hoffmann describes woodsmanship as a “body of traditional ecological knowledge (...)– the knowledge and techniques for managing trees, whether by cutting them or by otherwise using them and still keeping the woodland going.”<sup>161</sup> Several important reasons for this distinction emerge from the management systems' differing priorities. Harvesting timber, those large portions of a tree that can be cut as needed, is the objective of modest forest harvesting operations; medieval people, in contrast, focused more on the smaller underwood and branches for heat or small-scale construction.<sup>162</sup> Large oaks for timber were typically only harvested for new construction, repair, or maintenance, to avoid waste.<sup>163</sup> Two sustainable harvesting practices emerged from medieval woodsmanship: coppicing and pollarding.

<sup>158</sup> Rackham, *Trees and Woodlands*, 3.

<sup>159</sup> Francis & Dufraisse, 320.

<sup>160</sup> Rackham, *Trees and Woodlands*, 3, 19.

<sup>161</sup> Hoffmann, “An Environmental History of Medieval Europe,” 184.

<sup>162</sup> Rackham, *Trees and Woodlands*, 10, 38.

<sup>163</sup> Rackham, *Trees and Woodlands*, 69.

Coppicing takes advantage of the natural ability of some broadleaf tree species to grow new shoots from their stumps, which can then be harvested at the desired size.<sup>164</sup> Maple, oak, hazel, and chestnut are some examples of broadleaf species that exemplify this natural phenomenon.<sup>165</sup> Medieval forest management avoided waste and therefore selected trees to harvest by size to avoid unnecessary cutting. This typically led to ten-year coppice cycles to harvest wood appropriately and then to restart the process (See Figure 3).<sup>166</sup>

Pollarding is another traditional practice that follows the same principles of coppicing, but accounts for the effects of animal grazing (See Figure 4). Pollarded trees are cut at the branches above the reach of grazing animals, rather than the stump at ground level where the new shoots risk getting eaten.<sup>167</sup> This technique was not as widely practiced for its dangers to human life since a ladder was required to reach the branches but it provided a solution in forests where animal grazing and wood harvesting overlapped.<sup>168</sup>

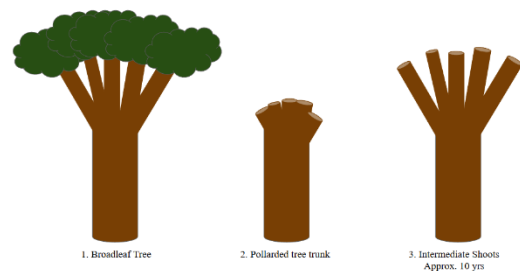


Figure 4: Pollard Trunk in Three Stages to demonstrate the harvest cycle of a traditionally managed woodland.

Harvesting techniques of the medieval period emulate modern understandings of sustainable forest practices. Hoffmann emphasizes the idea of sustainability as a dynamic equilibrium between the natural ability of an ecosystem and the pressures of human demand. Coppicing and pollarding take advantage of natural ecological succession in which the structure of the ecosystem adapts over time in response to changing conditions such as light availability and competition. Due to the popularity of coppicing over

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<sup>164</sup> Hoffmann, “An Environmental History of Medieval Europe,” 185.

<sup>165</sup> Rackham, *Trees and Woodlands*, 8.

<sup>166</sup> Rackham, *Trees and Woodlands*, 66.

<sup>167</sup> Hoffmann, “An Environmental History of Medieval Europe,” 186.

<sup>168</sup> Hoffmann, “An Environmental History of Medieval Europe,” 186.

pollarding, the focus will be on the ecological succession within coppices and its implications for sustainability.

Ecologist, forester, and botanist Peter Buckley commends traditional management practices for their ability to “[produce] an optimal habitat for species adapted to a regime of rapidly altering light, temperature and hydrological regimes.”<sup>169</sup> Each stage of the coppice cycle encourages a unique woodland ecosystem with varying levels of biodiversity. Biodiversity is essential to uphold the “economic, social and environmental components of sustainability.”<sup>170</sup> Richard Niesenbaum, Professor of Biology at Muhlenberg College, highlights the concept of “ecosystem services” to describe the connection between sustainability and biodiversity. Each service, divided into four categories as aforementioned, identifies the various interactions between humans and their environment. Provisioning services encompass the natural resources that can be used for material or energy purposes such as food, water, and timber.<sup>171</sup> The systems that maintain the functionality of the ecosystem, such as pollination or nitrogen fixation, are considered supporting services while regulating services work to maintain its natural conditions through processes like carbon dioxide exchange and erosion control.<sup>172</sup> Finally, cultural services provide personal fulfillment through recreation, education, and spirituality.<sup>173</sup>

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<sup>169</sup> Buckley, Peter. 2020. “Coppice Restoration and Conservation: A European Perspective.” *Journal of Forest Research* 25 (3), 127.

<sup>170</sup> Niesenbaum, Richard A. 2019. “The Integration of Conservation, Biodiversity, and Sustainability,” *Sustainability* 11, (17): 1.

<sup>171</sup> Niesenbaum, “The Integration of Conservation, Biodiversity, and Sustainability,” 5.

<sup>172</sup> Niesenbaum, “The Integration of Conservation, Biodiversity, and Sustainability,” 5.

<sup>173</sup> Niesenbaum, “The Integration of Conservation, Biodiversity, and Sustainability,” 5.



Figure 5: Early stage of a sweet chestnut (*Sativa castanea*) coppice at the Herstmonceux Estate, United Kingdom.

An analysis of the coppicing cycle allows for the opportunity to understand the interacting components of sustainability within its management. Supporting, regulating, and cultural services are sustained in the early stages when young shoots grow. The forest floor is open to high levels of sunlight as the canopy layer has yet to be established. Heliophilic plants that thrive off high levels of sunlight cover the forest floor, such as wildflowers and grasses.<sup>174</sup>

Buckley describes the early stages of a coppice woodland as a “diverse mix of open ground, intermediate and shade tolerant plants.”<sup>175</sup> Figure 5 features a copse of sweet chestnut (*Sativa castanea*) and sycamore maple (*Acer pseudoplatanus*) with diverse ground flora such as foxgloves, ferns, bluebells, bramble, and various grasses. These plants sustain populations of pollinators and other invertebrates with a rich supply of pollen and nectar.<sup>176</sup> Mammals, such as mice and shrews, enjoy the cover provided by the flora to hide from predators while foraging for food on the forest floor.<sup>177</sup>



Figure 6: Middle stage of sweet chestnut (*Sativa castanea*) coppice at the Herstmonceux Estate, United Kingdom.

In its “teenage” or middle phase of the cycle, a coppice woodland is quite thick and impenetrable, as shown in Image 6. As the canopy layer forms, less sunlight reaches the forest floor and the process of ecological succession shifts the structural composition from heliophilic to shade-tolerant plant species.<sup>178</sup> For example, the heliophilic foxgloves can no longer be found in Figure 6 where the

<sup>174</sup> Buckley, “Coppice Restoration and Conservation,” 127.

<sup>175</sup> Buckley, “Coppice Restoration and Conservation,” 127.

<sup>176</sup> Buckley, “Coppice Restoration and Conservation,” 127.

<sup>177</sup> Buckley, “Coppice Restoration and Conservation,” 127.

<sup>178</sup> Buckley, “Coppice Restoration and Conservation,” 128.

dense canopy layer prevents high levels of sunlight from reaching the forest floor. On the other hand, the new shoots are becoming quite thick in diameter which can be harvested in small quantities for provisioning services such as firewood.

The later stages of the coppice cycle support the lowest forest floor biodiversity. Figure 7 is dominated by the shade-tolerant bluebell flowers. It is in this stage of ecological succession

where the coppices outcompete other woody plants to dominate the canopy layer and are ready to be harvested based on the specific needs for wood. Each stage exists within the forest to create “a variety of different forest age- class and patches at a landscape level,” ensuring the continuity of plant and animal biodiversity throughout the forest. Furthermore, the four categories of



Figure 7: Late stage of sweet chestnut (*Sativa castanea*) coppice at the Herstmonceux Estate, United Kingdom.

ecosystem services can be sustained by doing so. Professor of Forest Ecology at the University of British Columbia J.P Kimmins

warns, “as we alter natural processes through management, we must replace the effects of those natural processes that we altered by the ecological effects of management practices.”<sup>179</sup> The coppice cycle, despite the fact it precedes modern understandings of sustainability, effectively replaces the effects of altering natural processes using ecological succession to conserve woodland biodiversity.

### 2.3.2 Imparkment

At the core of forest management are principles of conservation and preservation.

Though medieval English vocabularies lacked such, elements of these principles emerged in

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<sup>179</sup> Kimmins, J. P. 2004. *Forest Ecology : A Foundation for Sustainable Forest Management and Environmental Ethics in Forestry*. 3rd ed. Upper Saddle River, N.J: Prentice Hall, 232.

their woodsmanship techniques. Parks showcase an instrumental development of conservation as a management priority. Landscape historian Anthony Squires defines the medieval park as “[an area] of countryside securely enclosed for the inclusion of deer.”<sup>180</sup> Deer hunting forms the basis of a medieval park, contrary to modern ideas of parks and their role in conservation. The early concepts of conservation emerged from concerns over the dwindling deer populations in the thirteenth century through the development of breeding programs and maintenance of natural habitats.<sup>181</sup> According to Oliver Rackham, two types of parks existed with different conservation goals. The wood pasture park concentrated on the upkeep of the deer population, featuring a mixed landscape of forest and grassland to provide their necessary habitat and sustenance needs.<sup>182</sup> On the other hand, a compartmental park maintained a separation between its woodland and grassland by fencing coppices against wildlife for the conservation of the trees and wood harvesting.<sup>183</sup>

By the fourteenth century, English parks were common countryside. The Forest Charter allowed parks to popularize by granting more public access to the forest, though imparkment was nearly exclusively carried out by the crown and manorial or ecclesiastical lords.<sup>184</sup> Prior to the Forest Charter, imparkment was considered a punishable offence that infringes on the crown’s forest monopoly.<sup>185</sup> Profit was a major incentive for lords to create parks and take advantage of their newfound access to forest resources. The manorial income could be increased by renting

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<sup>180</sup> Squires, Anthony. 2001. “Parks and Woodland in Medieval Leicestershire 1086-1530.” in *Leicestershire Landscapes*, edited by Paul Bowman & Peter Liddle. Leicester: Leicestershire Museums Archaeological Fieldwork Group, 146.

<sup>181</sup> Mileson, Stephen. 2009. *Parks in Medieval England*. Oxford ; Oxford University Press, 28, 39.

<sup>182</sup> Cantor, L. M, and Hatherly, J. 1979. “The Medieval Parks of England.” *Geography* 64 (2), 72.

<sup>183</sup> Cantor & Hatherly, “The Medieval Parks of England,” 72.

<sup>184</sup> Mileson, *Parks in Medieval England*, 19.

<sup>185</sup> Cantor & Hatherly, “The Medieval Parks of England,” 76.

out park resources, receiving grants of deer, and sustaining a wood supply for use or sale.<sup>186</sup>

Lords aiming to reap the financial benefits of imparkment often hired officials, such as gentry or yeomen, to oversee park resource management.<sup>187</sup>

#### **2.4    *The Forest Charter of 1217***

The *Forest Charter of 1217* represents the complex interactions between humans, their institutions, and their natural environment. The Charter introduced concepts of environmental governance, conservation, and individual rights into medieval English society. It began with William the Conqueror's ambitious Domesday Survey in 1086 that aimed to record the existing English system of property ownership, including the country's forests.<sup>188</sup> Land as "a foundation of power" made the survey crucial to William's control over England.<sup>189</sup>

Michael John Jones describes the Domesday Book as "a system of unprecedented disciplinary surveillance whereby the King and the state [created] records of individual assets and liabilities," in relation to their property ownership and for which they could implement and collect taxes.<sup>190</sup> Within these records, organized into manors at the smallest level, information such as livestock, number of men, mills, forest coverage, and pasture land was meticulously described to create an "inventory" of the English landscape.<sup>191</sup> Legal historian William Swindler delves further to suggest the role of the Domesday Book in the organization of the feudal system

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<sup>186</sup> Cantor & Hatherly, "The Medieval Parks of England," 73, 80.

<sup>187</sup> Mileson, *Parks in Medieval England*, 21.

<sup>188</sup> Swindler, William F. 1966. *Magna Carta : Legend and Legacy*. Indianapolis: Bobbs-Merrill, 17.

<sup>189</sup> Swindler, *Magna Carta*, 12.

<sup>190</sup> Jones, Michael John. 2018. "Domesday Book: An Early Fiscal, Accounting Narrative?" *The British Accounting Review* 50 (3): 276.

<sup>191</sup> Jones, "Domesday Book: An Early Fiscal, Accounting Narrative?" 279.

in Late Medieval England.<sup>192</sup> This systematic recording created clear, written divisions of wealth based heavily on land ownership, in which forests played a central role.

Forests, as noted, were vital to the survival of medieval English society and so William the Conqueror set a precedent for the crown to monopolize these crucial environments and resources. Recall that the Rational Policy Analysis theory is based on the pursuit toward the highest return and lowest cost to an individual or collective.<sup>193</sup> It is evident that English monarchs in the High Middle Ages aimed to pursue the highest return and lowest cost on forest land and products using exclusionary policies within the Royal Forest system. Forests could be a rich source of income, encouraging the King to protect and guard these fruitful lands. Access to the forest in Late Medieval England was highly differential based on wealth and class within a forming feudal society. As Swindler highlights, this allowed wealthy landowners like barons and lords to wield their own power within the feudal system to protect the resources to secure incomes for themselves and the King.<sup>194</sup> These forests were not unoccupied or unused. The monopoly process required the eviction of forest inhabitants and systematic devaluations of their land to secure royal ownership.<sup>195</sup>

Protection and surveillance of the King's forests determined by the Domesday survey was crucial in maintaining royal authority over the land. Foresters and royal officers played a key role in the profitability of the English forests by collecting imposed payments and fines relating to all manners of forest resource use including foraging, firewood collection, and animal grazing.<sup>196</sup> Furthermore, such activities required permission from a forester for the appropriate

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<sup>192</sup> Swindler, *Magna Carta*, 17.

<sup>193</sup> Arts, "Forests policy analysis and theory use," 9.

<sup>194</sup> Swindler, *Magna Carta*, 12.

<sup>195</sup> Aberth, *An Environmental History of the Middle Ages*, 97.

<sup>196</sup> Swindler, *Magna Carta*, 12.

rent to be paid and monitor resource harvesting. Grazing livestock in the forest, for instance, required rent to be paid determined by the agister based on the number of animals.<sup>197</sup> Forest resources such as brush and timber were subject to chiminage fees collected by royal officers who visited homes to assess the total owed.<sup>198</sup>

The power of the King's foresters to impose fines, fees, and punishments exacerbated tensions between the Crown and its subjects in the early 13th century. Carrying out their duties in the isolation of the forest, royal officers often took advantage of their uncontested authority to bring in the most profits through rents and fines from the legally vulnerable populations accessing the forest.<sup>199</sup> Though rare, penalties could result in extreme measures such as bodily mutilation or execution, but more commonly led to time in prison or expensive fines.<sup>200</sup> Foresters are known to punish entire communities for anonymous violations of forest law.<sup>201</sup> The most extreme punishments were reserved for crimes involving the king's game deer. Killing a deer could inflict consequences of bodily mutilation, including blinding.<sup>202</sup> Protection of game deer went as far as to impose regulations on dogs which, if able to chase deer, needed to have three claws removed.<sup>203</sup>

By the time King John ascended the throne in 1199, the strengthening development of the feudal system further created tensions between the Crown and the English people who were failed by the political and legal systems intended to take advantage of them.<sup>204</sup> As the Rational

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<sup>197</sup> Swindler, *Magna Carta*, 114.

<sup>198</sup> Swindler, *Magna Carta*, 12.

<sup>199</sup> Swindler, *Magna Carta*, 328.

<sup>200</sup> Poole, *From Domesday Book to Magna Carta*, 33.

<sup>201</sup> Harris, Carolyn. 2015. *Magna Carta and Its Gifts to Canada : Democracy, Law, and Human Rights*. Toronto, Ontario, Canada: Dundurn, 24.

<sup>202</sup> Harris, *Magna Carta and Its Gifts to Canada*, 24.

<sup>203</sup> Swindler, *Magna Carta*, 114.

<sup>204</sup> Harris, *Magna Carta and Its Gifts to Canada*, 19.

Policy Analysis theory highlights, the pursuit of highest return and lowest cost often produces harmful consequences for others. Between the harsh punishments, heavy fines, and limitations on resource extraction, management of the royal forest was quite unpopular among the nobility, clergy, and peasantry.<sup>205</sup> Social pressures from widespread dissatisfaction with the corrupted institutions of the early thirteenth century led to one of the most important human rights documents and the predecessor to the Forest Charter: the Magna Carta. Magna Carta recognized and established limitations on the monarch's power, developing early ideas of common law and constitutional monarchy that would follow in later periods.<sup>206</sup> Remarkably, the inception of the Magna Carta appointed an investigation into the "evil customs of the forest" carried out by corrupt foresters and officers for 130 years since the Norman Invasion and subsequent Domesday record.<sup>207</sup>

King John signed Magna Carta on 15 June 1215, though it would continue to expand after his death the following year.<sup>208</sup> Since the forest was such a key part of its creation, the Forest Charter became a companion document by compiling the chapters dedicated to the common rights of the forest in 1217 under King Henry III's council.<sup>209</sup> The Charter clearly outlined the specific roles and limitations each officer held to challenge corruption among foresters. According to the Forest Charter, verdors were responsible for the vegetation and its harvesting; rangers were tasked with maintaining the animal populations and catching poachers; while agistors took charge of assessing livestock pasturing in the forests.<sup>210</sup> In this manner, the

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<sup>205</sup> Harris, *Magna Carta and Its Gifts to Canada*, 24.

<sup>206</sup> Harris, *Magna Carta and Its Gifts to Canada*, 11-12.

<sup>207</sup> Clark, Cristy, and Page, John. 2022. *The Lawful Forest: A Critical History of Property, Protest and Spatial Justice*. 1st ed. Edinburgh: Edinburgh University Press, 98.

<sup>208</sup> Harris, *Magna Carta and Its Gifts to Canada*, 32, 38.

<sup>209</sup> Swindler, *Magna Carta*, 112.

<sup>210</sup> Swindler, *Magna Carta*, 329.

Forest Charter can be seen as a “restoration of the rights and privileges of ‘the forest’s good and lawful men’” by safeguarding the ability for everyone to share access to the forest and its resources.<sup>211</sup> The Charter is divided into 16 clauses, or articles, ranging from changes to restrictions or fees associated with wood harvesting and lessening the severity of punishments. The articles of the Charter will be analyzed further throughout this paper.

The Interaction Model provides a unique perspective into the intersections between humans and the environment, especially in the context of the Forest Charter as a piece of environmental governance. Geography undeniably influences history, and as Clark and Page highlight, landscapes “become players in how law happens.”<sup>212</sup> The Forest Charter represents an evolution of the cultural sphere in the medieval English forest ecosystem with the first written piece of a governing forest law. Article 9 highlights this interaction, as it declares:

Every freeman may agest his own wood within our forest at his pleasure, and shall take his pavnage. Also we do grant, that every freeman may drive his swine freely without impediment through our demesne woods, for to agest them in our own woods, or else where they will. And if the swine of any freeman lie one night within our forest, there shall be no occasion taken thereof, whereby he may lose anything of his own.<sup>213</sup>

This article serves to sustain the biophysical structure of agriculture by regulating the use of the forest to feed livestock pigs. Before the Forest Charter, the King’s agisters could collect unregulated, expensive rents from peasants accessing the forest for livestock pasturing.<sup>214</sup> As mentioned, forests were essential to feed pigs as their easy-going diet could be supplemented with acorns and mast found on the forest floor, especially in the difficult winter times when food could be scarce.<sup>215</sup> Article 9 broadly addresses the failures of a monopoly structure of forest

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<sup>211</sup> Clark, *The Lawful Forest*, 86.

<sup>212</sup> Clark, *The Lawful Forest*, 96.

<sup>213</sup> The National Archives. 2025. “Charter of the Forest, 1225.” Accessed June 12th, 2024.

<sup>214</sup> Poole, *From Domesday Book to Magna Carta*, 32, 34.

<sup>215</sup> Woolgar, *Food in Medieval England*, 77.

management to sustain agricultural activities. While the material and energy flows from the forest ecosystem are available for agricultural purposes, such as feeding livestock, the presiding institution dominates instead for its own needs and disconnects from society's biophysical structures at the lower classes. Article 9 aims to remedy the monopoly by granting access to pasturing of livestock pigs "freely without impediment" to restore the interaction between agriculture and the forest.

### ***2.5 Conclusion: Medieval Forest Exploitation and Management***

The forest was clearly an "historical protagonist" in the changing social and environmental climate of the High Middle Ages. Diverse perceptions of the environment influenced the ways that people used and managed their forests within complex interactions between medieval English society and the forest ecosystem. Conflict between social classes and access to forest resources led to the pivotal creation of the Forest Charter of 1217 which continues to shape modern forest management in the United Kingdom and many of its colonial Commonwealth nations, including Canada.

Late Medieval England experienced many critical challenges and profound innovations in relation to woodlands. Resource management responded accordingly to population growth with techniques that aimed to balance the natural abilities of the forest ecosystem with human demand at the local level. The subsequent periods of global history marked by the colonization of humans and the environment brought forward increasingly negative attitudes towards nature, advancing uses of the forest, and management practices that met different priorities in a modernizing society. All of these changes in the interactions between human society and the forest ecosystem beg the question; What contributed to the loss of traditional knowledge of Medieval

woodsmanship? Part Two explores this phenomenon in the context of contact with the so-called “New World” and British colonialism.

### **3.0 Part Two: Transformations in Forest Management and the Early Modern World**

The pandemic that swept across the European continent in the mid fourteenth-century altered the medieval English way of life, including its relationship with the environment and its natural resources. Demographic growth that expanded agricultural practices and widespread forest clearances abruptly halted in 1349 as *yersinia pestis* claimed millions of lives.<sup>216</sup> Part Two traces the historical drivers that changed the ways people perceived and exploited their natural environment from the High Middle Ages while examining the forest as a central ecosystem in a transformative period of conflict and change. The loss of traditional, medieval woodsmanship practices and values during the early modern period will be explored as this phenomenon represents a critical historical legacy in the development of modern Canadian forestry.

#### ***3.1 From the ‘Dark Ages’ to the ‘Age of Exploration’***

Social change in the early modern period further diversified and complicated human interactions with the physical environment toward contemporary understandings of natural resources. The Tudor period represents a critical break in England from traditional medieval relationships with the forest. Transitions away from so-called feudal economies and toward more mercantile economies established the foundations of both capitalism and nationalism, both of which affected natural resource exploitation and the forest. Despite efforts for common rights

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<sup>216</sup> Rackham, *Trees and Woodlands*, 76.

and communal access to the forest with the Forest Charter of 1217, the early modern monarchy was motivated more by income and profit.

### 3.1.1 Expanding Uses and Management of the Forest

Social changes in early modern society expanded England's demand for forest resources from the medieval period. The early modern period saw an increase in literacy rates, in contrast to an overwhelming illiterate medieval society, with the invention of the printing press in the fifteenth century.<sup>217</sup> The achievements of the printing press must not be understated as information could be widely shared in written form, increasing the need for paper. Paper equally became a revolutionary tool and a tool for revolution as formal education reserved for the feudal upper classes became more accessible in the early modern period. However, the medieval method of using animal hides for "paper" could not sustain the demand of the printing press. England responded to this demand by creating paper from pulped textiles, though it wasn't best suited as a writing material due to its texture and colour.<sup>218</sup> Fine, white paper made from wood had to be imported from other European countries including Italy, Germany, and France until England began to produce its own in the late 17th century.<sup>219</sup>

Heat became a crucial asset to early modern society. The prosperity of the MCA could not be sustained into the Little Ice Age (LIA). While Michael E. Mann and his team confirmed a general trend of warm temperatures in the Northern Hemisphere between 950 and 1250, they similarly found a downward cold trend from 1400 to 1700.<sup>220</sup> The LIA brought unstable weather conditions generally summarized as cold and arid, unfavourable for agricultural crops and human

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<sup>217</sup> Hoffmann, "An Environmental History of Medieval Europe," 354.

<sup>218</sup> Craig, Heidi. 2019. "Rags, Ragpickers, and Early Modern Papermaking." *Literature Compass* 16(5), 3.

<sup>219</sup> Craig, "Rags, Ragpickers, and Early Modern Papermaking," 2.

<sup>220</sup> Mann, "Global Signatures and Dynamical Origins," 1257.

survival.<sup>221</sup> More wood was needed to heat the early modern English homes in colder, longer winters. Moreover, the growth of the urban population expanded medieval industries such as iron-smelting, glass-making, and salt-evaporating to support rising demands for these commodities and further increased the need for wood.<sup>222</sup> The introduction of coal as fuel for heat and energy in the urban centers of the seventeenth century helped to balance the firewood demand with the availability of forest resources.<sup>223</sup> Hindsight from a modern perspective commends the efforts to slow deforestation while lamentably understanding the social and environmental consequences of this shift towards fossil fuel.

Growing Tudor naval demand increased the need for timber to feed shipbuilding. The navy needed to be supported by forest resources to build fleets of various-sized ships out of timber. Naval forces specifically demanded softwood timber for the keel, decks, and masts of their ships.<sup>224</sup> Softwood, however, is not commonly found across England. Softwood tree species are often coniferous, or “evergreen,” such as spruce, fir, and pine. The English landscape is dominated by hardwood, commonly deciduous, species like oak, chestnut, and elm that were used for medieval timber purposes. Thus began the emergent practice of species selection where trees were selected to be harvested based on their type rather than their size.<sup>225</sup> The medieval practice of selecting trees based on size avoided waste by ensuring the felled trees fit their needs without needing to be extensively cut or shaped. Though species preference existed throughout

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<sup>221</sup> Behringer, *A Cultural History of Climate*, 143.

<sup>222</sup> McRae, Andrew. 2012. “Tree-felling in Early Modern England: Michael Drayton’s Environmentalism.” *The Review of English Studies* 63 (260), 412.

<sup>223</sup> Rackham, *Trees and Woodlands*, 76.

<sup>224</sup> Crevier, Martin. 2019. “The Making of a Timber Colony: British North America, the Navy Board, and Global Resource Extraction in the Age of Napoleon.” *Itinerario* 43 (3): 467.

<sup>225</sup> Rackham, *Trees and Woodlands*, 65.

the Middle Ages, harvesting was not confined to these species, and substitutes were made based on availability.

Much as William the Conqueror had done, in 1607, Elizabeth I surveyed her realm's woodlands to understand the inventory of English forest resources and subsequently documented the value and stock of timber in 1608.<sup>226</sup> Andrew McRae explains, "a resource in the process of being redefined as national rather than local could only be managed in a rational manner if it was accurately listed, quantified, and ultimately valued."<sup>227</sup> Elizabeth's interest in timber for nation-building is particularly forthcoming in the shift of medieval and early modern priorities in forest management. Cruck houses of the peasantry used very little timber at all, generally constructed in a manner that suited the sizes of available timber from local coppice woodlands. It was rather the smaller branches or developing shoots of the coppice stool that most of medieval English society sought for their heating and construction needs.

The growing demand for forest resources in early modern England provoked anxiety about depleting forest stocks, especially for timber. King James I (1566-1625) proclaimed, "If woods be suffered to be felled, as daily as they are, there will be none left."<sup>228</sup> By the seventeenth century, it was generally understood by all classes of English society that they were either in the midst or soon to be facing timber shortages.<sup>229</sup> Southern England, particularly in the county of Sussex, faced widespread deforestation consequential to an expanding urban population and naval force.<sup>230</sup> New methods of managing the English forest emerged in response

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<sup>226</sup> McRae, "Tree-felling in Early Modern England," 415.

<sup>227</sup> McRae, "Tree-felling in Early Modern England," 416-417.

<sup>228</sup> McRae, "Tree-felling in Early Modern England," 412.

<sup>229</sup> McRae, "Tree-felling in Early Modern England," 411.

<sup>230</sup> Crevier, Martin. 2019. "The Making of a Timber Colony: British North America, the Navy Board, and Global Resource Extraction in the Age of Napoleon." *Itinerario* 43 (3): 467, McRae, "Tree-felling in Early Modern England," 414.

to these concerns. Likewise, the management practices of the early modern period responded to the increasing national demands for forest resources as opposed to medieval woodsmanship that focused on the local population.

One such early modern method was the planting of economically valuable species. Experimentation with monoculture plantations began in the seventeenth century, though on a small, “gentlemen’s hobby” scale rather than an industrial one.<sup>231</sup> Early modern plantations were formed on the idea of “managing trees from the moment of germination” by growing seedlings in a controlled environment to be transplanted in rows like crops.<sup>232</sup> This management practice sharply contrasts with medieval values of woodsmanship and ecological succession. Rather than developing techniques that work symbiotically with natural ecosystem behaviour, this forest management model superimposes a relationship where the reforestation ecosystem is highly dependent on human caretaking.

The process of establishing plantations required the clear-cutting of an entire area and preventing natural regrowth by rooting up stumps and old stocks.<sup>233</sup> As mentioned, the farmland expansion of the High Middle Ages was extensive, but forests remained key for livestock keeping, among other agricultural practices. Medieval clear-cutting and assarting were not intended to be forest management practices as they became towards the end of the early modern period. It was in 1759 that the first English woodland in the southern county of Essex was completely replaced by a plantation.<sup>234</sup>

The traditional practice of coppicing continued into the early modern period to supply wood to a growing English population, as timber plantations were still in their experimentation

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<sup>231</sup> Rackham, *Trees and Woodlands*, 92-93.

<sup>232</sup> McRae, “Tree-felling in Early Modern England,” 418.

<sup>233</sup> McRae, “Tree-felling in Early Modern England,” 418.

<sup>234</sup> Rackham, *Trees and Woodlands*, 101.

phase. Coppicing techniques were, however, adapted to account for the advancing demands of the forest. The coppice cycle lengthened in the early modern period in response to the growing need for timber. In the medieval period, harvesting typically occurred within the first decade of the coppice cycle. By the sixteenth century, the cycle was often pushed past that first decade into the tree's eleventh or twelfth years of growth and further into their late teens by the eighteenth century.<sup>235</sup> Extending the coppice cycle allowed shoots more time to grow thicker in diameter for new timber demands.

Pollarding fell into decline alongside the diminishing wood pastures in the early modern period.<sup>236</sup> Early modern agriculture can be characterized by widespread enclosures of fields and pastures previously shared among the peasantry that emerged from the consequences of agricultural expansion as pasture lands shrank in favour of arable, grain fields.<sup>237</sup> Furthermore, sheep pasture was among the first of the common fields to be enclosed in the late medieval to early modern periods, therefore eliminating the need to practice pollarding which protected growing shoots from free-roaming livestock.<sup>238</sup> Enclosure will be analyzed further in Section 3.2 as it evolved into an integral piece of early modern forest management.

### 3.1.2 Establishing a “Timber Colony”

The rising demands and expanding uses of forest resources led early modern English society to adopt woodland practices within their own country, but also to establish external supplies of timber and wood. The Elizabethan Era of early modern England found particular interest in North America after John Cabot's explorations under Henry VI in the late fifteenth

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<sup>235</sup> Rackham, *Trees and Woodlands*, 82.

<sup>236</sup> Rackham, *Trees and Woodlands*, 144.

<sup>237</sup> Hoffmann, “An Environmental History of Medieval Europe,” 250.

<sup>238</sup> Hoffmann, “An Environmental History of Medieval Europe,” 250.

century.<sup>239</sup> As Martin Crevier highlights, “Expansion provided opportunities to secure a stable and cheap timber supply, but paradoxically increased and complicated demand.”<sup>240</sup> Elizabethan England faced numerous challenges to their internal and external supplies of timber. Trade in the Mediterranean became unreliable with increasing piracy and costs at the Baltic ports where England imported their timber.<sup>241</sup> Further conflict with France and the Dutch Republic in the 18th century further pushed England to secure their timber supply elsewhere.<sup>242</sup>

India and North America were two colonies heavily exploited for their timber. Alfred Crosby notes the physical environment often determines the establishment of a successful colony and that it is optimal for the colony to have a landscape and a climate like its imperial homeland to reconstruct a version of its society, or a “Neo-Europe”.<sup>243</sup> India, however, proved to be a complicated colony in establishing a timber export with challenging geography and climate in addition to political conflict with the East India Company.<sup>244</sup> On the other hand, North America had a more similar climate to the English with less political turmoil as the British had well-established their colonies by the late early modern period.<sup>245</sup> The victory of the British over the French during the Seven Years’ War in 1759 decisively affirmed England’s power over North America and its resources.

The growing need for timber overseas brought closer attention to Canadian rather than Indian timber, and forest surveys conducted along the St. Lawrence promised England a timber

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<sup>239</sup> Allen, John L. 1992. “From Cabot to Cartier: The Early Exploration of Eastern North America, 1497-1543.” *Annals of the Association of American Geographers* 82 (3): 519.

<sup>240</sup> Crevier, “The Making of a Timber Colony” 471.

<sup>241</sup> Crevier, “The Making of a Timber Colony,” 469.

<sup>242</sup> Crevier, “The Making of a Timber Colony,” 466.

<sup>243</sup> Crosby, Alfred W. 2004. *Ecological Imperialism : The Biological Expansion of Europe, 900-1900*. 2nd ed. Cambridge ; Cambridge University Press, 102.

<sup>244</sup> Crevier, “The Making of a Timber Colony,” 474.

<sup>245</sup> Crevier, “The Making of a Timber Colony,” 475.

supply that “would last several centuries” across the modern provinces of Quebec and New Brunswick.<sup>246</sup> Rising political tensions between the English and the Americans determined Canada to be England’s “timber colony”, as Martin Crevier names it. Furthermore, Eastern Canada’s trade networks were well-established from the seventeenth-century fur trade. Harbours along the St. Lawrence, such as Port Royal built in 1606, supported large ships for trade, immigration, and military defence.<sup>247</sup>

It was not solely timber that motivated the French and British in the seventeenth century to develop colonial trade routes. Colonizers also sought forest animals in support of the fur trade. For this thesis, the focus will be on timber trade, though its relationship with the fur trade must be noted. Medieval society often viewed their forest animals with an adversarial attitude rooted in fear. However, more collaborative attitudes towards forest animals dominated the early modern period where wildlife was commodified for commercial purposes in Western society. Like the English wolf populations of the thirteenth century, Canadian wildlife populations suffered a decline from human hunting. Colonizers hunted Canadian forest wildlife for their pelts to participate in a growing fur trade between the colonies and Europe rather than fear for their safety or their livestock populations as medieval farmers did. Felt used for hats and other high-demand luxury European fashion items increasingly came from North American beaver pelts.<sup>248</sup>

From the medieval to the early modern period, animals were generally not understood within the context of ecosystems and ecological health. A wide range of forest animals such as fox, caribou, and mink were hunted for their pelts, but the most popular was the beaver which

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<sup>246</sup> Crevier, “The Making of a Timber Colony,” 475.

<sup>247</sup> Paillé, *A History of Forestry in Canada*, 18.

<sup>248</sup> Carlos, Ann M., & Lewis, Frank D. 1999. "Property Rights, Competition and Depletion in the Eighteenth-Century Canadian Fur Trade: The Role of the European Market." *The Canadian Journal of Economics* 32 (3): 711.

constituted 80% of the fur trade.<sup>249</sup> The Hudson's Bay Company (HBC), a British trading company in Canada, monopolized the fur trade in the 18th century as the primary exporter of beaver pelts. Despite the beaver's importance to the fur trade, their habitats and populations were not well respected. Early modern beaver hunting became highly exploitative and commercialized as opposed to the more conservative medieval deer hunting. The Fur Desert Policy in the Snake River Basin by the HBC highlights this divergence as it intentionally cleared beaver populations from the basin through habitat destruction to force competitors out of the Yukon.<sup>250</sup> Furthermore, HBC representatives assessed the quality of the pelts as a luxury item. Thomas McCliesh of Fort Albany wrote that he "burnt 150 coats and parchment" that did not meet HBC standards, creating excessive waste as opposed to a medieval society that greatly avoided waste. British colonizers and merchants chose to prioritize profit over the ecological impacts of overhunting and habitat loss.

Forests of the East Coast and Lower Canada were exploited by the French and British settlers as they established their colonies. However, the two colonial powers approached the forests of the "New World" very differently at first. The French adopted the technique of selective cutting for species of trees, commonly softwoods such as white pine (*Pinus strobus*), with diameter limits in place for the conservation of larger, older individuals.<sup>251</sup> On the other

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<sup>249</sup> Carlos, Ann M., & Lewis, Frank D. "Indians, the Beaver, and the Bay: The Economics of Depletion in the Lands of the Hudson's Bay Company, 1700-1763." *The Journal of Economic History* 53, no.3 (1993): 472.

<sup>250</sup> Ott, Jennifer. " "Ruining" the Rivers in the Snake Country: The Hudson's Bay Company's Fur Desert Policy." *Oregon Historical Quarterly* 104, no.2 (2003): 166-167.

<sup>251</sup> Paillé, Gilbert. *A History of Forestry in Canada*. Québec: Publications du Québec, 2013, 15.

hand, the British adopted clear-cutting methods to infiltrate the “rough uncultivated wilderness” of Canada for its timber resources and land for agricultural conversion.<sup>252</sup>

It must be noted that clear-cutting in Canada began primarily to establish the colony at large, like those of the medieval agricultural clearances. Settlers emigrating from Europe needed access to agricultural land, fuel, and construction timber for themselves before trade could begin. Clear-cutting of forests for agricultural land continued from the medieval period to sustain growing populations and develop new colonies. Early modern agriculturalists in the colonies, however, introduced fire as a tool for clear-cutting in a method known as “black-cutting” where the leftover stumps and branches were burned to fertilize the soil rather than being pulled up or ploughed under as the medieval farmers did.<sup>253</sup> However, it is the adoption of clear-cutting into the timber trade that primarily concerns this paper.

The timber trade was not exempt from the attitudes of overexploitation and ecosystem destruction of the fur trade, especially with the rising demands for timber in the eighteenth century. Oliver Rackham names the eighteenth century as the “age of tree destruction” as the expansion of the British navy in addition to increasing emigration to the colonies advanced the rate of shipbuilding.<sup>254</sup> The first shipment of Canadian timber for England left New Brunswick in 1789 as a result of the forest surveys conducted along the St. Lawrence.<sup>255</sup> To account for timber as a tradeable commodity, harvesting methods needed to adapt to an early modern mercantile economy. The medieval approach where trees were mainly felled as needed became impractical

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<sup>252</sup> Paillé, *A History of Forestry in Canada*, 17, Bellemare, Jesse, Motzin, Glenn & Foster, David R. “Legacies of the Agricultural Past in the Forested Present: An Assessment of Historical Land-Use Effects on Rich Mesic Forests.” *Journal of Biogeography* 29, no. 10-11, 2002, 1403.

<sup>253</sup> Paillé, *A History of Forestry in Canada*, 17, 32.

<sup>254</sup> Rackham 97, Crevier, “The Making of a Timber Colony,” 470.

<sup>255</sup> Crevier, “The Making of a Timber Colony,” 475.

to supply the colony and England. Instead, harvesting occurred based on an identified plan ahead of time to ensure timber and fuel availability.<sup>256</sup>

This meant that coppicing was not a viable forest management practice in the colonies. Perhaps most importantly, the timber species sought in the colonies were mainly coniferous which cannot grow new shoots from the stump. Furthermore, the Canadian wilderness lacked the roads and paths of the English countryside for accessibility to the forest. Colonists heavily relied on the landscape's natural features to transport timber, unlike coppice wood which can be carried in carts on roads. Winter proved an advantageous season for harvesting as the frozen lakes and rivers could hold logs on the ice until spring when the natural water currents moved the logs downstream.<sup>257</sup> For these numerous reasons, clear-cutting methods prevailed in the colonies as opposed to coppicing or pollarding, losing touch with their traditional medieval woodsmanship practices.

### 3.1.3 Traditional Indigenous Forest Management

Crosby further highlights that the demographic and geographic expansion of Europe relied on the successful exploitation of the natural environment, but also on the exploitation of Indigenous peoples.<sup>258</sup> The early modern period is characterized by the colonization of land and people with the emergence of Enlightenment ideas that emphasized Western ideas of logic, reason, and improvement.<sup>259</sup> Colonizers who arrived in Canada did not discover an uninhabited land with limitless resources, though they treated the land and its people as such. Lost from these

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<sup>256</sup> Rackham, *Trees and Woodlands*, 82.

<sup>257</sup> Paillé, *A History of Forestry in Canada*, 17.

<sup>258</sup> Crosby, *Ecological Imperialism*, 146.

<sup>259</sup> Van Renen, Denys. 2018. *Nature and the New Science in England, 1665-1726*. Liverpool: Liverpool University Press, 2, 4.

narratives are the traditional methods that the Indigenous peoples of Turtle Island created with generations of ecological knowledge to co-exist with the environment.<sup>260</sup>

Michael Williams dispels popular myths of a pristine pre-colonial environment and the subsequent industrialization of the Americas, using fire as an example. Well before the British adopted “black-cutting”, Indigenous people across Turtle Island practiced controlled burning, though, admittedly, Indigenous uses of fire for ecosystem management remain poorly understood today. Williams states, “[the arrival of colonizers] may have been instrumental in causing forests to grow more rapidly and extensively than before” regarding the decline of controlled burn coinciding with the mass losses to Indigenous populations.<sup>261</sup> Many scientists and public citizens today view controlled burns in a similar light without knowledge of the ecological benefits understood by the traditional Indigenous peoples.

Interestingly, controlled burns take advantage of ecological succession, quite similar in principle to the medieval practices of coppicing and pollarding that relies on natural regeneration. Wildfires are a natural process in the forest ecosystem caused by combinations of lightning storms and dry fuel material such as needles, especially in the boreal forest. Controlled burns encourage ecosystem resilience to natural wildfire through ecological succession of fire-resilient tree species such as jack pine (*Pinus banksiana*).<sup>262</sup> By doing so, the ecosystem can recover much faster when dominated by fire-resilient species. Indigenous peoples of the prairies also applied controlled burns to maintain the species compositions of grasslands. Grasslands

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<sup>260</sup> When discussing the geographical area of “Canada” in this section I will instead be referring to “Turtle Island” as the traditional Indigenous peoples would have called it.

<sup>261</sup> Williams, “Deforesting the Earth,” 71.

<sup>262</sup> Eisenberg, Cristina, Christopher L Anderson, Adam Collingwood, Robert Sissons, Christopher J Dunn, Garrett W Meigs, Dave E Hibbs, et al. 2019. “Out of the Ashes: Ecological Resilience to Extreme Wildfire, Prescribed Burns, and Indigenous Burning in Ecosystems.” *Frontiers in Ecology and Evolution*, 10.

were important hunting grounds for Indigenous groups who relied on bison for their fur and meat. Remarkably, bison play a large role in maintaining the composition of grasslands as their horns and grazing habits help prevent the growth of invasive woody plants.<sup>263</sup> Controlled burns similarly eliminate the encroachment of invasive species into the grassland that would reduce the grazing areas of the bison.<sup>264</sup> Furthermore, ash from fire can be used as fertilizer to improve soil health.

On the West Coast of Turtle Island, Indigenous communities introduced forest gardens into the natural ecosystem to sustain their way of life while maintaining biodiversity and ecological health. Forest gardens are small areas of woods surrounding an Indigenous village managed specifically for plant species that provide essential survival items like fruits, nuts, and medicines.<sup>265</sup> Likewise, forest gardens were also beneficial for the wider forest ecosystem. Humans are not the only mammals in the forest to rely on edible plants. Moose, bears, and deer are known to frequent forest garden sites for their abundance of fruit-bearing plants and subsequently spread the seeds to more remote parts of the forest.<sup>266</sup> Similarly, perennial shrubs and flowering understorey species bring pollinators to the forest garden to spread pollen elsewhere in the forest.<sup>267</sup>

Other Indigenous management practices include transplanting, weeding, fertilizing, coppicing of birch and oak, and pruning.<sup>268</sup> Many of these practices were tended to by

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<sup>263</sup> Eisenberg et al., “Out of the Ashes,” 9.

<sup>264</sup> Eisenberg et al., “Out of the Ashes,” 8-9.

<sup>265</sup> Armstrong, Chelsey Geralda, Miller, Jesse E.D., McAlvay, Alex C., Ritchie, Patrick Morgan & Lepofsky, Dana. 2021. “Historical Indigenous Land-Use Explains Plant Functional Trait Diversity.” *Ecology and Society* 26 (2), 8.

<sup>266</sup> Armstrong et al., “Historical Indigenous Land-Use,” 11.

<sup>267</sup> Armstrong et al., “Historical Indigenous Land-Use,” 11.

<sup>268</sup> Armstrong et al., “Historical Indigenous Land-Use,” 6.

Indigenous women. Oral histories of “the Old-One” in the Interior Salish communities of Turtle Island highlight women’s roles as he says:

You will be as their mother, for from you, bodies will spring, and to you, they will go back. People will live as in your bosom, and sleep on your lap.... After this the earth gave birth to people.... He taught the women how to make birch baskets, mats, and lodges, and how to dig roots, gather berries and cure them. He taught the men how to make fire, catch fish, shoot, snare, trap, and spear game.<sup>269</sup>

Nancy Turner further emphasizes the role of women as keepers of traditional ecological knowledge from their positions as gatherers.<sup>270</sup> Children often joined women in their tasks, imparting much of their ecological knowledge in addition to values of conservation, gratitude, and respect to the next generations.<sup>271</sup> It is crucial to acknowledge this when discussing traditional ecological knowledge and the dichotomy between the importance of women’s perspectives in forest management in Indigenous and European practices.

Research into the traditional Indigenous forest management practices of the early modern period is relatively lacking. The early modern period began a replacement of nearly all Indigenous forest management practices with colonial clear-cutting to meet the demands of the incoming settlers and their trades. In some instances, it appears that settlers adopted Indigenous practices into their way of life, such as “black-cutting”, though intended for a different purpose opposite to Indigenous traditional values. Much of traditional ecological knowledge has been lost

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<sup>269</sup> Turner, Nancy. ““Passing on the News’: Women’s Work, Traditional Knowledge and Plant Resource Management in Indigenous Societies of North-western North America.” In *Women & Plants*, edited by Patricia L. Howard, 133-150. New York, Zed Books, 134.

<sup>270</sup> Turner, “Women’s Work, Traditional Knowledge and Plant Resource Management,” 134.

<sup>271</sup> Turner, “Women’s Work, Traditional Knowledge and Plant Resource Management,” 141.

among colonial efforts to assimilate Indigenous cultures into a Euro-centric way of life, including scientific methods.

### 3.2 *Inclosure Act 1773*

After five centuries, the Magna Carta and the Charter of the Forest nearly became obsolete in early modern England despite political tensions between the Crown and its subjects that continued into the early modern period. By the seventeenth century, the Magna Carta was essentially lost from English law as Stuart monarchs aimed for absolutism over a constitutional monarchy.<sup>272</sup> The *Inclosure Act of 1773* represents greatly different values regarding land ownership and public access to resources compared to the medieval period. Under the social and political conflict of the Tudor period, the enclosure of the forest instead helped to secure the timber supply by ensuring direct management from the Crown.<sup>273</sup> Scholars have traced the “enclosure movement” in Europe to patterns of colonial settlement in the Americas.<sup>274</sup>

The process of enclosure began as informal agreements between landowners and the Crown in the Tudor era, primarily to enclose sheep pasture.<sup>275</sup> Not everyone agreed with the enclosure of traditionally common or shared land such as pasture, woodland, or crop fields. Medieval manorial agricultural systems relied on collective community efforts to cultivate farmlands through assarting and ploughing. Family units responsible for certain strips or pieces of the manorial land then communally tended to the fields and pastures. Briony McDonagh underlines that “property” in the medieval sense referred to materials and animals rather than

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<sup>272</sup> Harris, *Magna Carta and Its Gifts to Canada*, 61, 64.

<sup>273</sup> McRae, “Tree-felling in Early Modern England,” 416-417.

<sup>274</sup> Greer, Allan. 2012. “Commons and Enclosure in the Colonization of North America.” *The American Historical Review* 117 (2): 365.

<sup>275</sup> Greer, “Commons and Enclosure,” 365.

land.<sup>276</sup> It was the resources themselves instead of the land that were considered private property. Aside from the royal forests that enforced strict rules and limitations, local woodlands were common lands for individuals to gather resources which then became their “property” to sustain their households or manors.

The Forest Charter of 1217 supported these ideas of private property and common land.

Article 12 states:

Every freeman from henceforth, without danger shall make in his own wood, or on his land, or on his water, which he has within our forest, mills, springs, pools, marlpits, dykes, or earable ground, without enclosing that earable ground, so that it be not to the annoyance of any of his neighbours.<sup>277</sup>

This article highlights the communal aspect of medieval property by highlighting the multiplexity of activities occurring in the forest from several community members. The Forest Charter ensured that the medieval forest was not managed or gatekept privately by allowing and encouraging a diverse range of human interaction within the forest from mills to dykes. Moreover, a clear opposition to enclosure maintains the forest as common land for “every freeman” to access with respect for each other. It is exemplary for arable land to be specifically unauthorized for enclosure by the Charter. The article emphasizes the importance of accessibility to croplands in a period of expanding agriculture and reliance on cereals for subsistence.

The freedoms granted by the Forest Charter did not last into the early modern period. Despite the endurance of the Charter in the English legal system, early modern initiatives for the improvement of the physical and political environment challenged the medieval notions of common lands and private property. Denys Van Denen claims, “Nature stimulated the British to

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<sup>276</sup> McDonagh, Briony. 2013. “Making and Breaking Property: Negotiating Enclosure and Common Rights in Sixteenth-Century England.” *History Workshop Journal* 76 (76): 46.

<sup>277</sup> The National Archives. 2025. “Charter of the Forest, 1225.”

reject the remnants of a feudal worldview and to form new social assemblages.”<sup>278</sup> The multitude of changing interactions with nature in this period, including exploration, climate change, and resource depletion, transitioned English society from a feudal to a mercantile or early capitalist worldview. Movements toward enclosure and private property represent a pivotal evolution within these interactions.

Institutional Policy Analysis theory introduces the influence of institutions and social pressures rather than the sole pursuit of high return and low cost. The early modern period saw the evolving role of institutions, such as education and government, in the daily lives of the British population. The *Inclosure Act* incorporates elements from growing colonial and mercantile institutions across the globe, transitioning enclosure from informal agreements to legally binding contracts.<sup>279</sup> On a much deeper level, however, the *Inclosure Act* transitioned common land to private property on the basis of improvement. The *Inclosure Act* diverges from the Forest Charter in its purpose. The purpose of the Act is described as “an Act for the better Cultivation, Improvement, and Regulation of the Common Arable Fields, Wastes, and Commons of Pasture in this Kingdom.”<sup>280</sup> The Forest Charter establishes a more humanistic element as its purpose is “for the salvation of our soul and the souls of our ancestors and successors, to the advancement of Holy Church, and amendment of our realm (...).”<sup>281</sup> While improvement is acknowledged in the Charter, it is not the sole purpose as in the Act.

The focus of the *Inclosure Act* on arable fields further contrasts with the Forest Charter. The enclosure of arable fields is addressed first in Article I of the *Inclosure Act* titled “How arable lands shall be fenced” ordered arable common fields to be “fenced, cultivated and

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<sup>278</sup> Van Renen, *Nature and the New Science in England*, 5.

<sup>279</sup> Greer, “Commons and Enclosure,” 367.

<sup>280</sup> The National Archives. 2025. “Inclosure Act 1773.”

<sup>281</sup> The National Archives. 2025. “Charter of the Forest, 1225.”

improved in such manner by the occupiers thereof (...).<sup>282</sup> This order sharply contrasts Article 12 of the Forest Charter that aimed to prohibit enclosure of arable fields. In the High Middle Ages, farmers were losing pasture to graze their sheep to landlords converting them to arable fields for cereal crops.<sup>283</sup> Enclosure could further reduce pasture fields by making them private property, directly affecting the landless farmers who relied upon them. Moreover, enclosing arable fields could also establish divisions where landowners could privately manage their own crops or livestock apart from his labourers and collective community.<sup>284</sup>

In the colonies, enclosure and private property movements shifted legislative attention to the forest. Initial colonization of Canadian soils involved communal efforts to cultivate the land for agriculture, like the medieval era of forest clearances. However, influence from European institutions promoted settlement patterns of private property. French colonizers also followed this pattern of “agricultural individualism” with the seignury system that situated a house, a barn, fields, and a woodlot within one parcel of land for a family unit to cultivate.<sup>285</sup> Agricultural individualism reflects the medieval manorial agricultural system on a much smaller scale, reducing the need for common fields shared among a community. This system allowed settlers to work their own land rather than tending to a parcel of land to contribute to the manorial estate.

Outside of individual woodlots on the property, the forest remained a common land. Allan Greer names the forest the “colonial commons” regarding its accessibility to local communities of settlers and Indigenous groups for its resources.<sup>286</sup> The wilderness of the “colonial commons” was a prime target for colonial ideologies of improvement, order, and

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<sup>282</sup> The National Archives. 2025. “Inclosure Act 1773.”

<sup>283</sup> Hoffmann, “An Environmental History of Medieval Europe,” 250.

<sup>284</sup> Hoffmann, “An Environmental History of Medieval Europe,” 249.

<sup>285</sup> Greer, “Commons and Enclosure,” 373.

<sup>286</sup> Greer, “Commons and Enclosure,” 370, 372.

reason. This included the people who had lived in these spaces for thousands of years.

Discrimination against forest dwellers and pagan worldviews from the medieval period allowed colonizers to justify their mission for the improvement of the Canadian wilderness and its inhabitants.<sup>287</sup> As noted earlier, medieval English monarchy sometimes evicted forest dwellers to establish royal forests. Similarly, enclosure and private property became weaponized as settlers and Indigenous people clashed in the “colonial commons”.

The *Inclosure Act of 1773* addresses this conflict on English soil in Article 8 regarding cottagers’ rights to common land. Article 8 states:

Provided always nevertheless, that nothing in this Act contained shall be construed to extend to exclude any cottager, or other person or persons whomsoever, having right of common, and having no land in any of the said common fields, from having and enjoying his or their right of common in as full and ample manner as he could and might have enjoyed the same before the passing of this Act (...).<sup>288</sup>

This article attempts to safeguard traditional rights and freedoms that the landless, lower classes relied on for their way of life. Anti-enclosure protests indicate otherwise. Many of the lower classes who traditionally worked on common lands and relied on common rights, such as those asserted by the Forest Charter, actively protested enclosure movements. Enclosures could block roads and paths, including those through parks, traditionally travelled to transport goods or livestock.<sup>289</sup> Protestors often took to breaking through hedge enclosures to continue travelling on traditional routes or stealing wood intended to build fences.<sup>290</sup> Furthermore, landowners could eliminate traditional shared grazing pastures for livestock. In response, livestock owners are

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<sup>287</sup> Van Renen, *Nature and the New Science in England*, 86.

<sup>288</sup> The National Archives. 2025. “Inclosure Act 1773.”

<sup>289</sup> McDonagh, “Making and Breaking Property,” 46, 47.

<sup>290</sup> McDonagh, “Making and Breaking Property,” 37.

reported to have trespassed onto the newly established private property and graze their livestock within the enclosure anyway.<sup>291</sup>

Article 8 further states that:

(...) unless each cottager or other person shall, at any meeting to be held by the occupiers of such common field lands, in manner aforesaid, consent or agree in writing to a composition for such a right by an annual payment, or other annual advantage or compensation, or to a limitation thereof (...).<sup>292</sup>

Cottagers dependent on the common lands could instead receive financial or other agreed-upon compensation in return for their traditional rights. The Forest Charter, on the other hand, aimed to restore traditional rights to the common land without a bribe to revoke them. Article 1 of the Charter promises that “if he has made forest of his own wood, then it shall remain forest, saving the Common of Herbage, and of other things in the same forest, to them which before were accustomed to have the same.”<sup>293</sup>

The opposing values between the Forest Charter and the *Inclosure Act* regarding traditional rights produced severe consequences for the Indigenous peoples of the “colonial commons”. Allan Greer argues that the exclusion of the Indigenous people from resource-rich, valuable land primarily motivated enclosure and private property in Canada.<sup>294</sup> Like the *Inclosure Act of 1773*, treaties between colonizers and Indigenous groups involved compensation in some manner in return for their traditional rights such as hunting grounds or access to waterways. Uncoincidentally, the Royal Proclamation of 1763 a decade before the *Inclosure Act*

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<sup>291</sup> McDonagh, “Making and Breaking Property,” 39.

<sup>292</sup> The National Archives. 2025. “Inclosure Act 1773.”

<sup>293</sup> The National Archives. 2025. “Charter of the Forest, 1225.”

<sup>294</sup> Greer, “Commons and Enclosure,” 366.

ensured the British Crown's sovereignty over traditional Indigenous territories and set a precedent for future treaty-making.<sup>295</sup>

Overall, it appears that the *Inclosure Act of 1773* reintroduced the “evil customs” that the Forest Charter of 1217 aimed to squander. In England, the enclosure of common land caused civil unrest and sparked protests in favour of traditional common rights. Early modern English society struggled to preserve the freedoms promised by the Magna Carta and the Forest Charter long forgotten by a tumultuous 500-year history of death and rebirth. Though the Inclosure Act directly involved the citizens of England, its effects reached North American shores in colonial missions to improve the physical environment and advance human “civilization”.

### 3.2.1 The Interaction Model Revisited

Transformations of the physical and social environments of the early modern period also transformed the dynamic interactions between natural and colonized ecosystems and human symbolic culture. To return to Figure 1.1, Richard Hoffmann's diagram of the Interaction Model highlights the role of human and society's biophysical structures in the colonization of ecosystems. In the medieval context of the Interaction Model, pre-industrial biophysical structures relied on the materials and energy provided by the ecosystem, and a limited degree of symbolic culture regulated these flows. The Forest Charter, for example, was a written piece of symbolic culture intended to protect access to the diverse resources available in the forest that supported many biophysical structures of medieval English society such as agriculture and ironmaking.

The early modern period saw a growth of society's biophysical structures and symbolic culture unequal to the natural and colonized ecosystems, shifting the balance of the Interaction

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<sup>295</sup> Albers, Gretchen. 2017. “Treaties with Indigenous Peoples in Canada.” *Canadian Encyclopedia*.

Model. Deneys Van Denen remarks, “colonials and traders enrich themselves with the plunder of vast territories.”<sup>296</sup> In doing so the early modern period pushed the boundaries of natural resource exploitation further than before, such as coal mining for urban England’s energy demands or clear-cutting for the timber trade. Plants and animals also reached the shores of faraway lands from European ships, infiltrating ecosystems that had not evolved for such species. Global environments became increasingly colonized, reducing the area of natural ecosystems. In the case of Turtle Island, forest ecosystems managed in a balanced manner by the Indigenous people were replaced by foreign crops, livestock, and clear-cutting practices. Rather than a mutual relationship between ecosystems and societal structures, the early modern period is characterized instead by a monopoly on material and energy resources with little regard for the ecological consequences.

Symbolic culture transformed alongside the growing biophysical structures and demands for natural resources. The diverging motivations behind the *Forest Charter of 1217* and the *Inclosure Act of 1773* highlight how symbolic culture influences the balance of the Interaction Model. While the Charter aimed to restore balance, the *Inclosure Act* seemingly tipped the scales in favour of human societal structures. Enforcing the enclosure of arable lands for “improvement” referred to improvement to meet human demands, not necessarily ecological restoration or sustainability. Furthermore, the *Inclosure Act* favoured certain structures or institutions that benefitted wealthier members of early modern English society.

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<sup>296</sup> Van Renen, *Nature and the New Science in England*, 87.

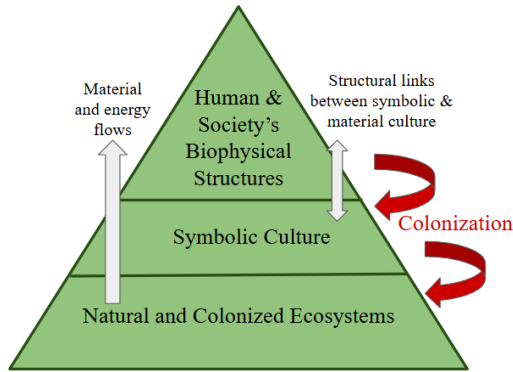


Figure 8: Interaction Model as a hierarchy. Adapted from Richard C. Hoffmann *An Environmental History of Medieval Europe* (2014), page 9.

The Interaction Model thus represents less of a balance and more of a hierarchy. Van Denen further explains, “attention to the physical environment triggers new approaches to fostering cross-cultural exchange and to reconfiguring sociopolitical assemblages.”<sup>297</sup> Colonization of ecosystems into the early modern period utilized symbolic culture to transform landscapes for human

demand successfully. Symbolic culture further allows the colonization of humans within these landscapes. Moreover, material and energy flows transform into much more of a one-way transaction where the ecosystem does not receive any benefit or compensation. For example, medieval coppicing maintained material and energy flows by encouraging biodiversity through ecological succession whereas clear-cutting severely disrupts the forest ecosystem.

The alternative Interaction Model allows deeper insight into the *Inclosure Act* by placing it in the symbolic culture category as a piece of governance. The *Inclosure Act*, as discussed, aimed to provide regulations for agriculture by enclosing crop fields and livestock pasture. This encouraged systematic colonization of the environment as the land within these enclosures became the property of the owner rather than land as its own entity or “property” for everyone to access. Enclosure further initiated systematic colonization in Canada as settlers converted the natural ecosystems into a Neo-European agricultural ecosystem and hoarded resources as private property from the Indigenous people. These structures, attitudes, and governance pieces

<sup>297</sup> Van Renen, *Nature and the New Science in England*, 13.

ultimately resulted in the overexploitation of the ecosystem with little return to maintain its natural state.

### 3.2.2 Loss of Sustainability

As mentioned, English timber and fuelwood harvesting methods needed to adapt from traditional woodsmanship to meet growing demands and incorporate new forest ecosystem types. Oliver Rackham asserts that by the end of the early modern period, traditional woodsmanship was in decline due to the exploitation of timber from the colonies.<sup>298</sup> The ecological repercussions of the transition from traditional woodsmanship to early modern formations of “forestry” are vast. Though coppicing and clear-cutting both rely on natural regeneration, these methods use different approaches in terms of their sustainability. Scientific research continues to explore these repercussions as they are still not fully understood.

Medieval English woodsmanship shows a clear understanding of ecological principles like succession and biodiversity, although these modern terms had not been fully realized yet. Coppicing and pollarding maintained biodiversity within the woodland by providing habitats for a range of plants, animals, and insects. A mosaic of different-aged stands allowed these habitats to exist within the same woodland. On the other hand, clear-cutting reduces or eliminates the habitats within the forest ecosystem. Forest conversion to agricultural land dislocates the resident populations of animals and insects. As with the case of the wolf in medieval England, these animals often come into conflict with humans and livestock in these new ecosystems and become targeted for extirpation out of safety concerns. Native plants also struggle to survive in converted

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<sup>298</sup> Rackham, *Trees and Woodlands*, 102.

ecosystems under new regimes of livestock trampling and grazing as well as changes to the soil composition.<sup>299</sup>

Clear-cutting for timber harvesting, rather than agricultural conversion, similarly affects biodiversity. Removing the most desirable or profitable tree species clears the area with few live standing trees.<sup>300</sup> Animals and insects must relocate elsewhere in the forest for shelter. Furthermore, clear-cutting produces soil disturbance unlike coppicing or pollarding since timber species are typically coniferous and unable to coppice, stumps are uprooted rather than left in the soil. Forests can naturally regenerate after clear-cutting, though key compositional changes often occur. Removal of the canopy and shrub layer in its entirety has consequences on soil fertility with the loss of macronutrients from decaying litter and organic material.<sup>301</sup> Combined with overexposure to sunlight and weather, regenerating tree species face many challenges post-cut. Young trees without shelter from other forest plant species risk mortality from frost and intense sunlight.<sup>302</sup>

Clear-cutting in the Canadian forest was just beginning to develop in the early modern period and remained primarily intended for conversion to agricultural land. Clear-cutting to harvest timber represents a pivotal transformation in traditional woodsmanship that arose toward the end of this period. Its divergence from coppicing and other traditional methods continued into the modern period where its biggest losses to sustainability can be seen. This will be discussed in Part Three. It is important to note the early changing motivations and values

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<sup>299</sup> Bellemare et al. “Legacies of the Agricultural Past in the Forested Present,” 1412.

<sup>300</sup> Fourrier, Arnaud, David Pothier, and Mathieu Bouchard. 2013. “A Comparative Study of Long-Term Stand Growth in Eastern Canadian Boreal Forest: Fire versus Clear-Cut.” *Forest Ecology and Management* 310: 11.

<sup>301</sup> Dussart, Esteban, and Serge Payette. 2002. “Ecological Impact of Clear-Cutting on Black Spruce-Moss Forests in Southern Québec.” *Écoscience (Sainte-Foy)* 9 (4): 540.

<sup>302</sup> Dussart & Payette, “Ecological Impact of Clear-Cutting,” 540.

between traditional management and clear-cutting to effectively trace its evolution into modern practices.

### 3.3 *Conclusion*

Social changes in England and across the globe transformed medieval practices of woodsmanship that valued sustainability and common rights into emerging management systems that exploited the environment and lower-class people. The expansion of the British empire into the Americas and other global colonies played a significant role in this transformation. Timber became a staple commodity to build an unrelenting naval force that dominated global seas. However, broader social movements also expanded the need for wood and timber with a growing urban population following the Black Death. The Renaissance and the printing press brought paper into the hands of common citizens with increased literacy rates and encouraged free-thinking.

Natural climate change in addition to colonial ventures caused widespread anxiety about forest resource depletion. In response, early modern monarchs turned their attention to the exploitation of their colonies' resources. Traditional medieval woodsmanship became lost among widespread clear-cutting for land conversion and contributions to the timber trade as coppicing and pollarding fell by the wayside alongside traditional Indigenous forest management, replaced by colonial ideologies of improvement, reason, and order dominated natural resource exploitation in England and Canada. Juvenile forms of modern forestry practices that continue to dominate Canadian logging operations, such as monoculture plantations, developed from these transformations in forestry and the early modern world.

Governance played a key role in constructing these early modern forestry practices that continue to influence modern forest governance. The *Inclosure Act of 1773* provided a legally

binding system of establishing private property and eliminating common access to shared resources of the medieval period. The Forest Charter of 1217 essentially became obsolete in the early modern world, including the colonies which followed influence from English law and society. These contrarian pieces of governance represent a pivotal transformation of Richard Hoffmann's Interaction Model that transitions from a balance to a hierarchy with human needs at the peak, moving away from the more ecologically responsible forest management practices, land ownership, and governance of the medieval period.

All of these transformations culminate in the development of modern Canadian forestry practices, and environmental history perspectives highlight the ways in which to learn from these transformations to work towards more ecologically responsible forest management in Canada today. Part Three will examine the ways in which the loss of medieval English woodsmanship affects the sustainability of modern Canadian forest management in a world that continues to rely on forest products. Furthermore, Part Three will aim to uncover ways in which modern Canadian forestry must "decolonialize" itself by remembering its medieval legacies that can move past outdated, early modern influences to be integrated with emerging scientific research and Indigenous Traditional Ecological Knowledge for improved sustainability.

#### **4.0 Part Three: Historical Legacies in Modern Forestry**

Oliver Rackham reminds us that "Forestry is an art in which, because of the long time-scale, failures tend to be forgotten, not learnt from, and thus later repeated."<sup>303</sup> Many of the historical narratives in popular understandings of Canadian forestry conjure images of lumberjacks facing the vast forest wilderness. Parts One and Two brought attention to the

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<sup>303</sup> Rackham, *Trees and Woodlands*, 101.

medieval and early modern background of Canadian forest history. As discerned, medieval English society sustained a growing population through woodsmanship practices that worked cohesively with natural ecological processes. Medieval people relied upon forests for fuel, building materials, forage, and livestock grazing. Despite a turbulent period following the conquest of England by William I in 1066, in which access to the forest became increasingly class-based, the *Forest Charter of 1217* promised freedom and shared rights for all royal subjects.

However, English society of the early modern period was based upon growing values of expansion, colonization, and improvement. The crown exploited forest resources to supply the timber demands of a global naval force to assert maritime dominance. Moreover, climatic conditions that brought long, cold winters to the Northern Hemisphere increased the demand for fuel wood to heat homes. English monarchs, anxious over resource depletion and sociopolitical conflict established a secure source of timber outside of Europe. Canada ultimately became England's "timber colony" and consequentially localized Indigenous forestry practices and medieval European woodland techniques gave way to more exploitative clear-cutting methods.

This long, enduring history of forest management, public land ownership, and forest governance from the medieval period continues to influence and shape forestry practices at play in modern Canada. This section explores the ecological and social consequences of the loss of traditional Indigenous and medieval forest management practices during the early modern period on the modern Canadian forest industry in the hopes of learning from the failures of the past. It does so, consciously, to draw lessons from the past as Part Three delineates three themes associated with Canada's historical forestry legacies: exploitative attitudes, forest governance, and sustainability. These three themes emerge as key points in which environmental history

perspectives can be implemented into forest management practices for more socioeconomic and ecologically sustainable practices. Each section concludes with a “call to action” to encourage future directions towards improved sustainability within modern Canadian forest management based on these themes.

#### ***4.1 Exploitative Attitudes***

As demonstrated in Part Two, the early modern period transformed attitudes towards the forest to become increasingly exploitative as traditional management practices focused on sustainability, ecological succession and waste reduction were put to the wayside in favour of colonial expansionist values. Many of these values persist in modern Canadian forest management, especially in the context of industrialization and globalism where demands for forest products have reached unprecedented levels under growing worldwide populations and urban development. Environmental history perspectives may inform the roots of current Canadian exploitative attitudes and the ways they continue to influence the sustainability of modern forest management.

##### **4.1.1 Industrialization and the Nineteenth Century**

In the nineteenth century, the Industrial Revolution reinforced natural resource exploitation on an unprecedented scale, especially in forests. The demand for forest resources expanded further into the nineteenth century with the growth of transportation systems and housing booms. Having established Canada as a timber colony, England relied on Canadian forests to support these advancements. Average houses in nineteenth-century England used a combination of Canadian-imported timber frames and locally manufactured brick.<sup>304</sup> However,

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<sup>304</sup> Clifford, Jim, and Stéphane Castonguay. 2022. “British Ghost Acres and Environmental Changes in the Laurentian Forest during the Nineteenth Century.” *Journal of Historical Geography* 78: 129.

the biggest timber consumer of the nineteenth century were railroads. The British built 20 921 kilometers of railway across the United Kingdom, coinciding with the peak of Canadian timber exports from 1845 to 1846 Canadian timber supplied railway ties as well as bridges and fences for an extensive transportation network.<sup>305</sup>

Jim Clifford and Stéphane Castonguay use the concept of “ghost acres” to illustrate the role of imported Canadian timber in British industrialization in the face of United Kingdom depletion. Clifford and Castonguay describe ghost acres as the phenomenon of consuming resources from abroad for local demand.<sup>306</sup> They estimate that British industrialization could not have advanced without Canadian ghost acres which contributed nearly 9 299 676 059 square meters of the Laurentian Valley forest, or the near-equivalence of the entirety of Britain’s nineteenth century forest.<sup>307</sup> All of this logging activity also required sawmills to process raw materials into usable lumber, thus, the nineteenth century saw 4 500 sawmills develop across Canada, initially operating along waterways to receive felled logs from upstream.<sup>308</sup>

Clifford and Castonguay’s calculation of ghost acre lumber does not consider Canadian timber exports to other markets, including those within North America. The Grand Trunk Railway of the mid-to-late nineteenth century, for example, also connected Canada to key economic centers in eastern North America, including Toronto and Montreal.<sup>309</sup> As settlers and merchants travelled westward toward Vancouver Island many trading posts were isolated from the railway systems of Eastern Canada.<sup>310</sup> Ultimately, a transcontinental railway, the Canadian Pacific Railway (CPR) motivated by the political unity of Canadian Confederation, connected

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<sup>305</sup> Clifford & Castonguay, “British Ghost Acres and Environmental Changes,” 130.

<sup>306</sup> Clifford & Castonguay, “British Ghost Acres and Environmental Changes,” 126.

<sup>307</sup> Clifford & Castonguay, “British Ghost Acres and Environmental Changes,” 130.

<sup>308</sup> Paillé, *A History of Forestry in Canada*, 33, 34.

<sup>309</sup> Paillé. *A History of Forestry in Canada*, 34.

<sup>310</sup> Royle. *Company, Crown and Colony*, 8.

Canada's East and West Coasts.<sup>311</sup> Material goods (including timber) and people could travel to and from the western frontier thanks to Canadian-grown wood products.

Indeed, Canada's forests continue to provide countries across the globe with wood products such as pulp and paper, a forest product industry that rapidly expanded into the twenty first century as global demands for paper exceeded 270 million tons in the year 2000 as opposed to 100 million tons in the mid twentieth century.<sup>312</sup> Forests, moreover, continue to provide material for construction with North American construction projects consuming more than 150 million cubic metres of lumber in the twenty first century compared to only million cubic metres in the mid twentieth century.<sup>313</sup>

Industrialization exacerbated collaborative attitudes from the medieval and early modern period in which humans and the environment could be shaped by one another. However, expanding on colonial ventures and rising forest product demands industrialization in the nineteenth century solidified an unbalanced relationship between the physical environment and human society that persists in Canada. In Southern Ontario, for example, dense urban populations and agricultural settlements consequential of industrialization have severely deforested the Carolinian forest to a mere three percent of its original coverage.<sup>314</sup>

#### 4.1.2 Mechanization

The increasing pressures on natural resources and manufacturing industries to supply a growing demand for goods led to the mechanical innovations that characterize modern forestry. Log booms, timber slides, and dams transformed the logging industry of the nineteenth century

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<sup>311</sup> den Otter, A.A. "Railway Technology, the Canadian Northwest, and the Continental Economy." *Railroad History*, no.162 (1990): 8.

<sup>312</sup> Paillé, *A History of Forestry in Canada*, 301.

<sup>313</sup> Paillé, *A History of Forestry in Canada*, 288.

<sup>314</sup> Ontario Heritage Foundation. *Ontario's Heritage: A Celebration of Conservation*, 56.

by re-engineering natural waterways.<sup>315</sup> In contrast, twentieth-century innovations aimed to move the logging industry away from waterways and toward more remote areas of Canada's forests. Mechanical harvesting in the early twentieth century included gasoline-powered chainsaws to fell trees quicker and easier compared to large manual handsaws that required two operators.<sup>316</sup> Combined with large trucks capable of transporting logs in remote forests on rough roads, logging productivity increased by nearly 300 percent by the mid-twentieth century.<sup>317</sup> By this time large machines such as the crawler tractor that could fell and transport logs dominated the modern-era of Canadian forestry.<sup>318</sup>

By the late nineteenth century, as white pine populations in the Laurentian Valley diminished, the logging of spruce in more remote forests became popular.<sup>319</sup> Spruce, a softwood, remains today a sought-after species for the pulp and paper industry. Spruce is abundant in boreal ecosystems of the Canadian Shield which had not been previously targeted by the logging industry until the twentieth century when mechanical innovations and market demands encouraged its harvest.<sup>320</sup> Moreover, mechanization allowed clear-cutting practices to reach unprecedented levels in remote areas that had previously remained unlogged for commercial or industrial purposes. By the turn of the nineteenth century, the Canadian logging industry was harvesting approximately 20 million cubic meters of timber annually and this figure has increased tenfold to approximately 200 million cubic meters in the twentieth century.<sup>321</sup>

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<sup>315</sup> Clifford & Castonguay, "British Ghost Acres and Environmental Changes," 135.

<sup>316</sup> Paillé, *A History of Forestry in Canada*, 214-216.

<sup>317</sup> Paillé, *A History of Forestry in Canada*, 214-216.

<sup>318</sup> Paillé, *A History of Forestry in Canada*, 216.

<sup>319</sup> Clifford & Castonguay, "British Ghose Acres and Environmental Changes," 136.

<sup>320</sup> Dussart & Payette, "Ecological Impact of Clear-Cutting," 533.

<sup>321</sup> Paillé, *A History of Forestry in Canada*, 190.

The machines themselves produce ecological consequences as the weight of forestry vehicles can compact the soil up to thirty-six centimetres from its weight under the tire tracks, which alters the soil quality by decreasing water permeability. Thus, making it difficult for the surrounding plants to access nutrients, which can have a permanent effect on the area.<sup>322</sup> Soil compaction can impact reforestation efforts if the root tips of seedlings are unable to penetrate the soil and grow deeper to support a large tree.<sup>323</sup> If managed properly, these machines can be used advantageously to create lines of loosened soil in a process called scarification that aims to uncover the most fertile soil beneath the surface. However, scarification is often difficult to manage properly due to landscape features such as rocks, fallen trees, or driver error, which may undermine reforestation efforts by minimizing the growth of the planted trees.

Despite Canada's independence from Britain, natural resource management remains deeply intertwined with colonial attitudes of exploitation. David Rossiter highlights that "colonial pasts become visible in the present" when examining Canada's current state of natural resource management.<sup>324</sup> In this sense, the legacies of more diverse medieval attitudes toward nature or Indigenous ecological knowledge continue to be overshadowed by exploitative, colonial attitudes whose aims are linear progress and expansion, especially with the use of mechanical equipment. Rather than work cohesively with natural processes like traditional woodsmanship of the medieval period, mechanization can directly work against these processes and greatly disturb the ecosystem. The early modern mythologized and colonial view of Canada as an uninhabited extension of British soil has allowed exploitative practices to persist under a

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<sup>322</sup> Horn, R, Vossbrink, J, Peth, S & Becker, S. 2007. "Impact of modern forest vehicles on soil physical properties." *Forest Ecology and Management* 248 (1-2), 60, 62.

<sup>323</sup> Taylor, H.M & Brar, G.S. 1991. "Effect of soil compaction on root development." *Soil and Tillage Research* 19 (1-2):114.

<sup>324</sup> Rossiter, David A. 2008. "Producing Provincial Space: Crown Forests, the State and Territorial Control in British Columbia." *Space & Polity* 12 (2): 219.

modern esoteric regime of mechanical forestry. Today, these exploitative practices remain mostly constrained within Canada's Crown Lands governed by strict forest laws.

#### 4.1.3 Call to Action to Move Forward from Exploitative Attitudes

These exploitative attitudes dominate every aspect of modern Canadian forestry, but alternative perspectives and ideas are slowly pushing the industry towards greater sustainability for our economy and environment. Environmental history perspectives stress the importance of maintaining a balance between nature and society which is significantly shaped by perceptions and attitudes towards the environment. Medieval people held diverse attitudes ranging from fear and awe, exploitation and sustainability, and more. The attitudes held by modern society towards the environment are not so distant from our medieval predecessors. While medieval people feared a biblical apocalypse, often citing natural disaster as evidence of the end times, modern society fears a more anthropogenic apocalypse in the wake of human-driven environmental catastrophes. Currently, environmental phenomena such as climate change, deforestation, and pollution continue to inspire a range of perceptions and attitudes about our natural world.

Environmental history reveals how critical attitudes are in shaping the ways in which humans interact with the forest. Colonial attitudes of the early modern period were characterized by exploitation, improvement, and control over the environment. Though other attitudes lingered from the medieval period, exploitative attitudes prevailed in a time of expansion and development. Many of the differences between management practices, landownership, and forest governance of the medieval and early modern periods lie within these contrasting attitudes toward the environment. Evolving modern attitudes toward the environment to move beyond profit-driven, human-centric perspectives can greatly impact the sustainability of modern natural resource management practices.

Nature-based environmental education offers a promising solution to think differently about our environment. Environmental education can build an intrinsic motivation or desire to behave in a manner that is ecologically responsible based on connectedness to nature and knowledge of the environment.<sup>325</sup> Though perhaps most impactful on children, environmental education can build this intrinsic motivation and connection to nature in all stages of life, including adults.<sup>326</sup> This can include short-term or long-term programming, such as forest schools, field trips, or classroom workshops, but can also consist of simply visiting natural areas and immersion into nature.<sup>327</sup> Under growing urbanization and reduction of natural areas, environmental education and immersion in nature critical in reshaping our attitudes toward the environment.

#### **4.2 Forest Governance**

The *Forest Charter of 1217* and the *Inclosure Act of 1773* represent diverging values regarding management, ownership, and governance between the medieval and early modern periods. *Magna Carta* was popularized among political elites in the seventeenth century when the King appointed Sir Edward Coke to the Court of Common Pleas. Coke often spoke against absolute monarchy and in support of a constitutional monarchy, citing the *Magna Carta*.<sup>328</sup> *Magna Carta* and its companion document, the *Forest Charter of 1217*, inform our modern understandings of Crown Lands as public lands. The *Inclosure Act of 1773*, however, informs how these public lands are managed rather as a mosaic of private property for various industries

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<sup>325</sup> Otto, Siegmar, and Pamela Pensini. 2017. "Nature-Based Environmental Education of Children: Environmental Knowledge and Connectedness to Nature, Together, Are Related to Ecological Behaviour." *Global Environmental Change* 47, 88-89.

<sup>326</sup> Otto, "Nature-Based Environmental Education of Children," 89.

<sup>327</sup> Otto, "Nature-Based Environmental Education of Children," 89.

<sup>328</sup> Harris, *Magna Carta and Its Gifts to Canada*, 64.

and commercial purposes. Carolyn Harris highlights that the Forest Charter had a “formative impact on attitudes towards the environment and Crown Land” regarding public access and conservation for all Canadians to benefit.<sup>329</sup> Unsurprisingly, Magna Carta became a foundational document in influencing the *British North America Act* of 1867 which established constitutional monarchy between the British Crown and its Canadian provincial and federal governments.<sup>330</sup>

As Crown Lands became increasingly provincially managed following the *British North America Act*, the responsibility of forest governance shifted. *The Crown Timber Act* first developed federally in 1826 to govern Canadian logging on Crown Lands until it was replaced by provincial legislation following Confederation. Henceforth, each jurisdiction passed its own legislation, effectively creating provincial acts to manage forests on their Crown Lands. These provincial acts continue to manage the Crown Lands such as the *Public Lands Act* (1990) in Ontario which replaced its provincial *Crown Timber Act* in 1995. It must be noted that forestry in Canada is governed by a multitude of federal and provincial laws, but this section will focus on the provincial *Crown Timber Act* of Ontario for its role in modernizing Canadian forestry into its current, familiar state.

#### 4.2.1 Crown Timber Act

David Leadbetter explains how modern natural resource exploitation and management are based on transnational market exchanges to meet global demands and “maximize private profit”.<sup>331</sup> Recall that the Green Economies Theory emphasizes the need to place a high market value on ecosystem services: provisioning services, regulating services, supporting services and

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<sup>329</sup> Harris, *Magna Carta and Its Gifts to Canada*, 108.

<sup>330</sup> Harris, *Magna Carta and Its Gifts to Canada*, 91-95.

<sup>331</sup> Leadbeater, David, ed. 2014. *Resources, Empire & Labour : Crises, Lessons & Alternatives*. Black Point, N. S: Fernwood Publishing, 13.

cultural services. Furthermore, the Green Economies Theory emphasizes the interactions between human society and the environment that is foundational to the modern capitalist economy. The Crown Land system in Canada allows the forest industry to participate in exploitative business ventures focused on what is now considered provisioning services that are often most profitable. Presently, the federal government owns 41 percent of Crown lands and provincial governments own 48 percent. The remaining 11 percent are owned privately.<sup>332</sup> Crown Lands today allow governments to set aside land for public use: municipalities, individuals, and organizations, including natural resource industries, may purchase or lease these lands.<sup>333</sup>

The *Crown Timber Act* of Ontario set precedent for enforcing fees to harvest forest products on its provincial Crown Lands as it states:

The Minister [of Natural Resources] may grant a licence to cut such timber to the person making the highest tender therefor for such period as he or she considers proper, subject to such terms and conditions as are prescribed in the regulations and subject to such other terms and conditions as he or she considers proper and that are not inconsistent with the regulations.<sup>334</sup>

Therefore, loggers in the modern era of Canadian forestry had to cooperate with the provincial Ministry of Natural Resources and the costs they implemented to access Crown Land. Contrary to the medieval Forest Charter, the *Crown Timber Act* required careful documentation and recording of forest resource extraction. Logging companies with license to harvest Crown Lands were “subject to such terms and conditions as are prescribed by the regulations and at such

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<sup>332</sup> Neimanis, V.P. 2024. “Crown Land.” *The Canadian Encyclopedia*.

<sup>333</sup> Neimanis, V.P. “Crown Land.”

<sup>334</sup> Government of Ontario. “Crown Timber Act, R.S.O. 1990, c. C.51.” *King’s Printer for Ontario, 2012-24*.

prices.”<sup>335</sup> Interestingly, the *Crown Timber Act* emulates Article 14 of the Forest Charter as it reads:

a forester in fee, paying us farm for his bailiwick, shall take chiminage; that is to say, for carriage by cart the half-year 2 pence, and for another half-year 2 pence, for an horse that beareth loads, every half-year, an half-penny, and by another half-year half a penny; and but of those only that come as merchants through his bailiwick by license to buy bushes, timber, bark, coal and to sell it again at their pleasure<sup>336</sup>

This article clearly outlines the fees for merchants to extract resources from the forest for profit, like the Crown Timber Acts across modern Canada. Article 14 waives the chiminage for people accessing the forest for resources to survive, only to charge those who “come as merchants.” As provincial governments gained control over their natural resources after Confederation, this aspect of the Forest Charter was revived to manage forest stocks and logging more fairly while earning revenue for the province and its people.

Despite its similarities to the Forest Charter, the *Crown Timber Act* is deeply connected to the early modern values of the *Inclosure Act of 1773*. Article 13 of the *Inclosure Act* states:

Provided also, that all and every person and persons who shall have licence in manner aforesaid to plough up and convert into tillage any balk, slade, or meer shall, before he or they begin to plough up the same, lay down in an husband-like manner under the direction of the field master or field reeve (...) and so continue until the regulations then existing for cultivating such common field lands shall expire.<sup>337</sup>

Here, the *Inclosure Act* outlines how licenses must be granted first to access the resources, arable fields instead of forest in this instance, rather than the public access of the Forest Charter. Like Crown Timber agents regulating timber harvest, article 13 references the field master or reeve in control of the ploughing activities. Sari Graben and Christian Morey explain that Crown Lands, though advertised as public land of the province or country, are managed along ideals and values

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<sup>335</sup> Government of Ontario, “Crown Timber Act, R.S.O. 1990, c. C.51.”

<sup>336</sup> The National Archives. “Charter of the Forest, 1225.”

<sup>337</sup> The National Archives. “Inclosure Act 1773.”

of private ownership.<sup>338</sup> H.V Nelles writes, “As Ontario entered the twentieth century the old pre-industrial concept of Crown ownership of natural resources was very much alive.”<sup>339</sup> Though licensing and granting permits with the *Crown Timber Act* seemingly distributed natural resources more equitably, it concentrated power over the land’s resources to the Crown and province, allowing direct control of provisioning ecosystem services.<sup>340</sup>

Leasing and exploiting the Crown Lands through provincial legislation produced severe consequences for Indigenous people across Canada. Crown Lands were established as a result of colonial expansion into Indigenous territories that included inequitable treaty-making where Indigenous communities could receive protection of rights or monetary compensation in exchange for their land.<sup>341</sup> The concentrated power over forest resources is subject to an interesting phenomenon where the landowner itself creates legislation regarding its own land management, much like private property ownership, which has historically been used to colonize Indigenous territories and develop areas of Crown Land.<sup>342</sup>

To explore this further, the Crown Timber Act asserts that:

“public lands” means the lands vested in Her Majesty in right of Ontario and under the management of the Minister, and includes the lands in respect of which a lease, licence of occupation or permit has been granted or issued under the *Mining Act*, the *Provincial Parks Act* or the *Public Lands Act*; (“terres publiques”).<sup>343</sup>

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<sup>338</sup> Graben, Sari, and Morey, Christian. 2019. “Aboriginal Title and Controlling Liberalization: Use It like the Crown.” *University of British Columbia Law Review* 52 (2): 445.

<sup>339</sup> Nelles, H.V. 2014. “The Image of the State.” In *The Politics of Development*. Canada: McGill-Queen’s University Press, 489.

<sup>340</sup> Graben & Morey, “Aboriginal Title and Controlling Liberalization,” 443.

<sup>341</sup> Usher, Peter J. and Larmour, Peter. 2013. “Common Property and Regional Sovereignty: Relations between Aboriginal Peoples and the Crown in Canada.” In *The Governance of Common Property in the Pacific Region*, 103-122. ANU E Press, 104.

<sup>342</sup> Graben & Morey, “Aboriginal Title and Controlling Liberalization,” 436, 450-451.

<sup>343</sup> Government of Ontario, “Crown Timber Act, R.S.O. 1990, c. C.51.”

This definition confirms Graben and Morey’s assertion that Crown Lands are managed and perceived as private property of the government. Indeed, this definition also brings attention to the growing recreational uses, or cultural ecosystem services, of the Canadian forest in the modern period. Crown Land makes up the land on which national and provincial parks attract millions of visitors annually. Algonquin Park, established on Ontario Crown Land and the traditional territory of the Algonquin people in 1893, provides excellent insight into the role of the government in creating recreational and tourism opportunities on Crown Land. “Close your eyes and imagine an old growth forest. (...) Imagine this beautiful space, unmarred by traffic and pollution. (...) This is what we strive to protect and restore in Ontario’s provincial parks,” says Ontario Parks when describing the ecological integrity of the parks system.<sup>344</sup>

Contrary to these images of Ontario Parks as a preserved wilderness, logging within the park continues to this day, primarily in the North Eastern areas, farthest away from recreational camp sites, highlighting how provincial control of Crown Land can be flexible with the objectives of leases or agreements with third parties that may not always be transparent to the public.<sup>345</sup> Bill Parenteau emphasizes that “Since the mid-nineteenth century, control of the Crown Lands has translated into enormous power over the direction of state forest policy. At the present time, the concentration of control of the public forest is greater than ever.”<sup>346</sup> Hence, economic advantage to the province may motivate exceptions for logging rights on public Crown Land. For example, engineers who constructed Toronto’s subway system relied heavily on

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<sup>344</sup> Ontario Parks. 2025. “Ecological Integrity.”

<sup>345</sup> Graben & Morey, “Aboriginal Title and Controlling Liberalization,” 440, 448.

<sup>346</sup> Parenteau, Bill. 2013. “Looking Backward, Looking Ahead: History and Future of the New Brunswick Forest Industries”. *Acadiensis*, 42(2): 108.

(softwood) hemlock trees for railway ties. Today, that species struggles to recover its population in Algonquin Park.<sup>347</sup>

Modern Canadian forest governance of the Crown Lands is largely influenced by the the *Forest Charter of 1217*, which asserts rights of access to “public land”. It is striking how the Crown Timber Act follows similar patterns of monetary exchange between landowners and merchants through rents and leases in nineteenth century Canada to chiminage and licenses in thirteenth century England. Early modern influences of colonialism and capitalism, however, push the regulations of the Crown Timber Act away from medieval values of common rights of land towards an ownership system based on notions of private property and natural resource exploitation. Accordingly, Indigenous peoples historically and continue to face severe consequences of these colonial legacies intertwined with modern forest governance models and natural resource extraction.

#### 4.2.2 Call to Action for Responsible Use of Crown Land

Crown Lands represent a crucial opportunity for collaboration between the public, logging companies and governments to consult one another on management of forests on public land. Some researchers encourage public participation in forest policy-making and governance to reach sustainability goals within the industry by including sociocultural issues of recreation, employment, and access to resources.<sup>348</sup> On the East Coast of Canada, for example, there is concern “that government does not report regularly to the Legislative Assembly and the public on the status of New Brunswick’s Crown forest and its management.”<sup>349</sup> In many cases, a lack of

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<sup>347</sup> Graben & Morey, “Aboriginal Title and Controlling Liberalization,” 360-361.

<sup>348</sup> Miller, Lauren, and Solange Nadeau. 2020. “Perceptions of Public Land Governance from Two Canadian Provinces: How Is the Social Agenda Being Met through Sustainable Forest Management?” *Land Use Policy* 91: 1-2.

<sup>349</sup> Miller & Nadeau, “Perceptions of Public Land Governance, 2.

transparency can heighten distrust and misconceptions toward the forest industry. In 2005, for example, public reaction to a request to increase harvesting on New Brunswick Crown Land by double led to controversy and the hiring of a consulting firm to increase transparency with the public.<sup>350</sup>

Methods of public participation in the forest industry can range from committees, surveys, and reviews of policies to address public concerns of biodiversity loss, control of public lands, and job loss.<sup>351</sup> Forest Advisory Committees, for instance, may communicate such concerns to logging companies or governing ministries and serve as a middle ground between the public and the ministry.<sup>352</sup> Bill Parenteau specifically addresses the “dismissal of alternative models of forest industry development” as a key conflict, or “disconnect”, between the values of the public and the values of logging companies regarding management of Crown Lands.<sup>353</sup> The values and concerns of the public are essential to the forest management practices occurring near their local communities and across the country and must not be dismissed. The public has a unique capability to incite change, as shown by the environmental movements of the modern period, many of which center on the conservation of forests. As far back as 1900, organizations such as the Canadian Forest Association incited public knowledge of forest conservation to gain support for their cause.<sup>354</sup> Furthermore, Rachel Carson’s book *Silent Spring* (1962) shared a broad image to the public of what life would be like under severe biodiversity loss. Environmental history perspectives highlight the importance of public involvement in decision-

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<sup>350</sup> Miller & Nadeau, “Perceptions of Public Land Governance, 5.

<sup>351</sup> Eguny, Felicitas, Reed, Maureen G., Sinclair, A. John, Parkins, John R., and Robson, James P. 2020. Public engagement in forest governance in Canada: whose values are being represented anyway?. *Canadian Journal of Forest Research*. **50**(11): 1153

<sup>352</sup> Eguny et al. “Public engagement in forest governance in Canada”, 1153.

<sup>353</sup> Parenteau, “Looking Backward, Looking Ahead,”109.

<sup>354</sup> Paillé, *A History of Forestry in Canada*, 48.

making and change to build relationships between the public and the forest industry to work towards a more sustainable future.

### 4.3 *Sustainability*

#### 4.3.1 Silviculture and Reforestation

Oliver Rackham emphasizes that modern forestry thinks of trees as arable crops, as opposed to how medieval woodsmanship treated trees as successive crops.<sup>355</sup> Regulated, scientific systems needed to be put in place to manage and plan forests as arable crops that constitute modern forestry management practices.<sup>356</sup> Similar to agriculture, “silviculture” refers to the management of harvestable forest resources.<sup>357</sup> Silviculture intends to strike a balance between sustaining the economic and ecological roles of the forest.<sup>358</sup> Modern Canadian forestry relies heavily on a plantation silvicultural system, introduced to British woodlands in 1759, where hectares are clear-cut then replanted with economically valuable species.

Clear-cutting in the modern period is a silvicultural system strictly supervised by various regulations to “ensure a future for the commercial forestry firms, as well as adequate wood supplies to meet the demands of a growing population.”<sup>359</sup> Modern clear-cutting claims to emulate natural disturbances in the forest ecosystem such as fire, insects, disease, or weather which initiate regeneration through ecological succession.<sup>360</sup> Image 6.0 demonstrates how clear-cutting in the boreal forests of Ontario disrupts the landscape, leaving few live and dead trees

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<sup>355</sup> Rackham, *Trees and Woodlands*, 3.

<sup>356</sup> Rossiter, “Producing Provincial Space,” 218.

<sup>357</sup> Boucher, Yan, Arsenault, Dominique, Sirois, Luc & Blais, Louis. 2009. “Logging Pattern and Landscape Changes over the Last Century at the Boreal and Deciduous Forest Transition in Eastern Canada.” *Landscape Ecology* 24 (2), 171.

<sup>358</sup> Groot, A, Lussier, J.M., Mitchell, A.K. & MacIsaac, D.A. 2005. “A silvicultural systems perspective on changing Canadian forestry practices.” *The Forestry Chronicle* 81 (1): 51.

<sup>359</sup> Natural Resources Canada. 2025. “Forestry.” *Natural Resources Canada*, 2025.

<sup>360</sup> Dussart & Payette, “Ecological Impact of Clear-Cutting,” 534.



Figure 9: Clear-cut block in the Black Spruce Forest near Thunder Bay, Ontario. May 27th, 2022.

standing, in imitation of a fire. In contrast, traditional woodsmanship practices of the medieval period promote continuous forest cover and biodiversity with ecological succession quite opposite to clear-cutting.

This melange of trees are part of the silvicultural requirements of the forest management plan agreed upon between governments and logging companies. Fires and other disturbances do not often wipe out every individual tree in the area due to geographic protection such as valleys or bodies of water, or

physiological protection like bark. By preserving few standing trees the clear-cut management plan outlines “a strategic vision and a commitment to protect multiple forest values in the area under management.”<sup>361</sup> However, a key drawback to the clear-cut silvicultural system arises in the boreal forests where the majority of modern Canadian logging occurs. Clear-cutting removes the canopy layer, or overstory, which opens the forest floor to sunlight and though beneficial for the ecological succession of coppice woodlands of deciduous trees, coniferous boreal forest species struggle to regenerate naturally against exposure to intense light and frost.<sup>362</sup>

Clear-cutting is often portrayed by logging companies and forest organizations as an ecologically responsible silvicultural system because of overstory removal. Forests Canada describes how “removing a large proportion of the tree canopy allows many boreal tree species to germinate and flourish (...) resulting in an even-aged forest stand.”<sup>363</sup> Even-aged stands,

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<sup>361</sup> Natural Resources Canada. 2025. “Forest Management Planning.” *Natural Resources Canada*, 2025.

<sup>362</sup> Dussart & Payette, “Ecological Impact of Clear-Cutting,” 540.

<sup>363</sup> Forests Canada. 2025. “Clearcutting Fact Sheet.” *Forests Canada*, 2025.

especially those of monocultures, are not resilient to climate changes or disease.<sup>364</sup> I argue that even-aged stands are more beneficial for the logging companies rather than the ecosystem as they can be easily harvested at one time, as traditional woodsmanship promotes uneven-aged stands that are biodiverse and ecologically healthy. Silviculture systems based on uneven-aged forest stands are often undesirable to logging companies citing economic and production-based challenges, such as the need to remove the diverse understory to reduce competition with commercially valuable species.<sup>365</sup>

Most alternative silvicultural systems in Canada are based on the ecological benefits of uneven-aged stands. The shelterwood system, for example, simulates natural disturbances on a smaller scale than clear-cutting to take advantage of natural ecological succession.<sup>366</sup> The shelterwood system is a silvicultural practice that retains most of the canopy layer through the removal of trees in intervals over time to leave more live-standing trees than a clear-cutting system while relying on natural regeneration and ecological succession on the forest floor.<sup>367</sup> Research suggests that plant diversity on the forest floor is highest under a semi-open canopy as it provides a range of light availability for shade-tolerant and intolerant species.<sup>368</sup> The uneven-aged stand created by the shelterwood system maintains the habitat of tree-dwelling animals instead of removing them like clear-cutting does. As noted earlier, coppices host a diverse range

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<sup>364</sup> Ligot, Gauthier, Philippe Balandier, Sophie Schmitz, and Hugues Claessens. 2020. "Transforming Even-Aged Coniferous Stands to Multi-Aged Stands: An Opportunity to Increase Tree Species Diversity?" *Forestry (London)* 93 (5): 616.

<sup>365</sup> Diaci, Jurij, Gary Kerr, and Kevin O'hara. 2011. "Twenty-First Century Forestry: Integrating Ecologically Based, Uneven-Aged Silviculture with Increased Demands on Forests." *Forestry (London)* 84 (5): 465.

<sup>366</sup> Groot et al., "A silvicultural systems perspective on changing Canadian forestry practices," 52.

<sup>367</sup> Diaci, "Twenty-First Century Forestry," 465.

<sup>368</sup> Gao, Tian, Marcus Hedblom, Tobias Emilsson, and Anders Busse Nielsen. 2014. "The Role of Forest Stand Structure as Biodiversity Indicator." *Forest Ecology and Management* 330: 89.

of habitats for forest wildlife because of its uneven-aged characteristics ranging in canopy cover and density.

Thinning, or partial harvesting, is another silvicultural system based on the management of an uneven-aged forest stand. Rather than maintaining the canopy, thinning systemically harvests an area in small sections to keep most of the forest intact rather than clear-cutting entirely. The remaining trees, with reduced competition for space and nutrients, can continue to grow and be harvested later.<sup>369</sup> Silviculture studies on commercial thinning estimate that harvesting only 30-40 percent of the area will positively impact tree diameter and volume.<sup>370</sup> In Canada, thinning or partial harvesting is often used within clear-cut systems to improve timber volume and quality rather than an independent silvicultural system for improved ecological responsibility.<sup>371</sup>

Despite the obvious ecological benefits of alternative logging systems, clear-cutting remains the dominant silvicultural system in Canada. More than 100 000 acres of Ontario Crown Land were clear-cut in 2023, while shelterwood and partial harvesting constituted less than 20 000 acres.<sup>372</sup> One of the conditions to lease Crown Land for commercial logging is that “all forests harvested on public lands must be regenerated as part of sustainable management.”<sup>373</sup> Thus, instead of utilizing natural ecological succession to meet this condition, anthropogenic reforestation is a prominent silvicultural method adopted by Canadian forest companies to meet

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<sup>369</sup> Gauthier M-M, Barrette M, & Tremblay S. 2015. “Commercial Thinning to Meet Wood Production Objectives and Develop Structural Heterogeneity: A Case Study in the Spruce-Fir Forest, Quebec, Canada.” *Forests* 6 (2), 511.

<sup>370</sup> Gauthier, “Commercial Thinning to Meet Wood Production Objectives,” 525-526.

<sup>371</sup> Government of British Columbia. 2024. “Commercial Thinning Research.” *Government of British Columbia*

<sup>372</sup> Watkins, Larry. Ontario’s Forest Facts. 2023.

<sup>373</sup> Government of British Columbia. 2024. “Commercial Thinning Research.” *Government of British Columbia*.

this condition of their lease. In 1954, the *Crown Timber Act* attempted to enforce reforestation as the responsibility of the company, but it wasn't until the *Forest Act of 1987* that this legislation successfully passed.<sup>374</sup> Accordingly, approximately 700 million trees have been planted annually since the beginning of the 21st century.<sup>375</sup>

Commercial reforestation relies on human labour to navigate the difficult terrain of the Canadian Shield. Tree planters, generally young adults and post-secondary students are hired sub-contractually to infiltrate the Crown Lands each year and replace the forest stock harvested by loggers. Foresters “prescribe” percentages of tree species that must be replaced in the area based on their records of what was harvested. Planters then hand-plant seedlings grown in nurseries into the exposed soil post-logging. Preparation for reforestation can include scarification where machines “groom” the block by overturning the soil to expose the nutrient-dense under layers, creating trench-like rows to plant the seedlings.

This system of reforestation is publicly advertised as a sustainable method to mitigate the effects of clear-cut harvesting and forest degradation. Although there is astonishingly little research into the effectiveness of tree planting to reforest post-logging operations in Canada, or worldwide, emerging studies indicate suppressed height growth and high mortality rates of planted white and black spruce trees in the boreal forest with many researchers are citing poor soil quality as a main driver of these issues.<sup>376</sup> Though clear-cutting is intended to mimic fire disturbance, wildfire and controlled burns can benefit the soil composition through ash fertilizer and decaying organic matter.<sup>377</sup> Soil exposed to the elements from clear-cutting experiences

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<sup>374</sup> Paillé, *A History of Forestry in Canada*, 226.

<sup>375</sup> Paillé, *A History of Forestry in Canada*, 229.

<sup>376</sup> Dussart & Payette, “Ecological Impact of Clear-Cutting,” 540.

<sup>377</sup> Dussart & Payette, “Ecological Impact of Clear-Cutting,” 540.

decreased rates of decomposition as organic material is removed which negatively affects nitrogen fixation to provide nutrients for growing saplings.<sup>378</sup>

Moreover, human error and carelessness accounts for a large portion of tree mortality and suppressed growth that slip under the records. Planters in Canada are paid per tree, typically between 12.5-14 cents, fostering a culture of hustle and competition to earn a reasonable income. The tree planting season produces a liminal space where social norms and expectations are essentially erased as workers are removed from their comfort zones and removed from society.<sup>379</sup> Many planters engage in dishonest practices to get higher pay, such as being dishonest about the number of trees they planted or stashing seedlings outside of the planting limits to increase their pay.

That is not to suggest that every tree planter engages in these practices, but many other factors can influence human error. “J roots” occur when a seedling is planted in shallow soil, causing the roots to curve upwards instead of downwards. Such trees will grow for a few years only until they fall over without a proper root system to support themselves. Species can also be planted in unsuitable microhabitats that cause premature death. Pine trees, for example, grow best in drier soil whereas spruce thrive best in wet soil. Planters may not know, or care enough, to plant in the most suitable microhabitat under the pressure of earning money and competing with others. These shortcomings of current reforestation efforts may not be well-known among the public, but they certainly are within the forest industry, with foresters and inspectors often overlooking the intentional shortcuts and mistakes made by the planters. Forest companies are required to reforest their leases within 3-5 years at their own expense to maintain their

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<sup>378</sup> Gao et al., “The Role of Forest Stand Structure as Biodiversity Indicator,” 88.

<sup>379</sup> Sweeney, Brendan. 2009. “Producing Liminal Space: Gender, Age and Class in Northern Ontario’s Tree Planting Industry.” *Gender, Place and Culture : A Journal of Feminist Geography* 16 (5): 571.

agreements with the government, and thus it may be more advantageous to overlook these shortcomings.<sup>380</sup> Alana Lettner describes this issue as she states, “Tree planting is seen as an attempt to ameliorate the impacts of logging for the good of a region’s ecology, rather than as a greenwashing measure used by various extractive industries to continue business as usual.”<sup>381</sup>

Canadian silvicultural systems and their objectives are built upon the legacies of their medieval and early modern past. Like coppicing and pollarding, silviculture heavily relies on principles of natural ecological succession. It should be noted that clear-cuts can naturally regenerate themselves by succession without the need for manual hand planting. Tree planting intends to replace only the profitable species quickly for future harvest. Unlike traditional medieval woodsmanship practices, modern silviculture depends on human colonization of the ecosystem. Coppice wood naturally regrows without human intervention, but plantations must be artificially introduced and nurtured. In many cases, the natural process of ecological succession is eliminated from clear-cuts through continuous human management such as the use of pesticides, pruning, and removing competing non-profitable plants.

Interestingly, the process of ecological succession is foundational to shelterwood and thinning systems. Shelterwood and coppicing both encourage high levels of biodiversity because of their varying levels of light that can support shade tolerant and heliophilic plants. These systems similarly require no human management, and in many cases, shelterwood systems are left to naturally regenerate. Commercial thinning and partial harvesting appear as a hybrid all these systems from medieval to modern. Like coppicing, thinning takes advantage of natural ecological process with an intermediate level of human management to encourage regeneration

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<sup>380</sup> Paillé, *A History of Forestry in Canada*, 229.

<sup>381</sup> Lettner, Alana Friend. 2023. “Don’t Thank Me for Being a Tree Planter.” *The Tyee*.

of new trees and the growth of standing ones. Hence, the Canadian forest industry often adds thinning to clear-cut systems that have supplied demand for forest products since the early modern period. Tree planting is an entirely modern silvicultural system that deeply reflects colonial, exploitative attitudes about natural resource extraction and profit.

#### 4.3.2 Marginalized Perspectives

As the Canadian forest industry continues to modernize, perspectives that have historically been silenced or erased raise important questions about the sustainability of our management practices. Contrary to popular images of Canadian forest history dominated by male loggers, women occupied unique spaces in the forest industry. In the early twentieth century, women in forestry were often confined to the laboratory or other academic spaces, but not the forests.<sup>382</sup> Targeted for administrative work, women became stenographers, typists, and clerks among trends towards large corporate environments instead of smaller, local businesses.<sup>383</sup> Thus, forest companies began recruiting women in the 1970s as the industry became more socially acceptable and inclusive for women.<sup>384</sup>

Some women broke through twentieth-century barriers to obtain domestic jobs in bush camps, or to work as laundresses, cleaners, or clerks. Such tasks could often be taken on by the foreman's wife, local Indigenous or settler women.<sup>385</sup> Indigenous women in their communities, on the other hand, were connected to the forest as gatherers. Indigenous communities continued

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<sup>382</sup> Baruah, Bipasha, and Sandra Biskupski-Mujanovic. 2021. "Navigating Sticky Floors and Glass Ceilings: Barriers and Opportunities for Women's Employment in Natural Resources Industries in Canada." *Natural Resources Forum* 45 (2): 186.

<sup>383</sup> Lowe, Graham S. 1980. "Women, Work and the Office: The Feminization of Clerical Occupations in Canada, 1901- 1931." *The Canadian Journal of Sociology / Cahiers Canadiens de Sociologie* 5 (4), 361-362.

<sup>384</sup> Natural Resources Canada. 1998. *The State of Canada's Forests: The People's Forests 1997-1998*. Ottawa: Micromedia Ltd., 74.

<sup>385</sup> Radforth, Ian. 1987. *Bushworkers and Bosses: Logging in Northern Ontario 1900-1980*. Toronto: University of Toronto Press, 92.

to rely on traditional practices for most of their diet into the early twentieth century.<sup>386</sup> The encroachment of the Crown Lands into Indigenous territories, however, alongside the forests rendered communities unable to speak out against their destruction and were excluded from any financial profit.

Indigenous people and settler women were essential to commercial reforestation that began in the 1950s in response to concern about deforestation.<sup>387</sup> Organizations struggled to recruit hesitant white males of local communities and instead recruited women, Indigenous people, and prisoners.<sup>388</sup> Women in fieldwork reported higher instances of sexism and sexual harassment than women working in the office.<sup>389</sup> Furthermore, apprenticeships in forestry are mainly found through male social networks disadvantaging women competing in a “boys club”.<sup>390</sup> Forestry is a non-traditional occupation with women accounting for less than 25 percent of the workforce.<sup>391</sup>

Ecofeminism connects colonial, exploitative ideologies that place hegemonic masculinity superior to women and other subordinate “masculinities” such as nature.<sup>392</sup> Conservation movements in the twentieth century popularized from women’s activism work led women to speak out against similar patriarchal systems of oppression that aim to domesticate and exploit natural resources.<sup>393</sup> Indigenous women are among the foremost activists to demand more sustainable forestry; however, they are most often employed in the lowest-paying jobs within the

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<sup>386</sup> Rude, Darlene, and Deiter, Constance. 2004. *From the Fur Trade to Free Trade: Forestry and First Nations Women in Canada*. Ottawa, Ont: Status of Women Canada, 20.

<sup>387</sup> Sweeney, “Producing Liminal Space,” 573.

<sup>388</sup> Sweeney, “Producing Liminal Space,” 573.

<sup>389</sup> Baruah & Biskupski-Mujanovic, “Navigating Sticky Floors and Glass Ceilings,” 197.

<sup>390</sup> Baruah & Biskupski-Mujanovic, “Navigating Sticky Floors and Glass Ceilings,” 191.

<sup>391</sup> Baruah & Biskupski-Mujanovic, “Navigating Sticky Floors and Glass Ceilings,” 184.

<sup>392</sup> Kheel, Marti. 2008. *Nature Ethics: An Ecofeminist Perspective*. Maryland: Rowman & Littlefield Publishers Inc, 36, 208.

<sup>393</sup> Kheel, *Nature Ethics: An Ecofeminist Perspective*, 38, 81.

forest industry such as catering, cooking, and housekeeping rather than managerial or decision-making roles.<sup>394</sup> Women are also minimally represented within local band leadership despite direct interactions with logging activity while performing community roles in gathering food and medicine.<sup>395</sup>

The diverse collection of TEK held by the Indigenous communities across Canada are mostly lost among generations of assimilation into Western social norms, including ways of scientific thinking. Researchers and communities are uncovering the surface of the complex ways TEK informed Indigenous ecosystem management. TEK is connected with broader values of environmental stewardship and cooperation with nature often missing from Western scientific ideologies.<sup>396</sup> Self-governing communities can continue their traditional sustainable forestry practices, which the Menominee community is internationally recognized for.<sup>397</sup>

#### 4.3.3 Call to Action to Prioritize Sustainability in Forest Management

Per Angelstam states, “there is thus a need to adapt present management to maintain and develop cultural and natural values of forest landscapes (...).”<sup>398</sup> Environmental history perspectives emphasize the importance of maintaining natural and cultural ecosystem services to create a balanced relationship with the environment, especially in the forest. As discussed in detail in section 4.3.1, alternative partial-cutting methods maintain critical habitats for a diversity

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<sup>394</sup> Baruah, Bipasha, and Sandra Biskupski-Mujanovic. 2023. “Indigenous Women’s Employment in Natural Resource Industries in Canada: Patterns, Barriers and Opportunities.” *Women’s Studies International Forum* 99, 2-4.

<sup>395</sup> Rude & Deiter, *From the Fur Trade to Free Trade*, 21, 30.

<sup>396</sup> Hoagland, Serra J. 2017. “Integrating traditional ecological knowledge with western science for optimal natural resource management.” *IK: Other Ways of Knowing*. 3(1): 1.

<sup>397</sup> Hoagland, “Integrating traditional ecological knowledge with western science,” 4.

<sup>398</sup> Angelstam, Per, Robert Axelsson, Marine Elbakidze, Lars Laestadius, Marius Lazdinis, Mats Nordberg, Ileana P tru-Stupariu, and Mike Smith. 2011. “Knowledge Production and Learning for Sustainable Forest Management on the Ground: Pan-European Landscapes as a Time Machine.” *Forestry (London)* 84 (5): 584.

of plant and animal species, improving ecosystem resiliency as well as increased tree diameter growth in the Canadian boreal forest.<sup>399</sup> However, Canadian logging companies are reluctant to embrace these methods, opting rather for clear-cutting to harvest forest products to increase capital. Arun Bose and his researchers pose that the “absence of a tradition of partial cutting in the Canadian boreal forest presents both challenges and opportunities,” but they trace the emergence of “natural disturbance based” silviculture practices to the 1990s, when in fact this thesis well-establishes an evolution much farther in the medieval past.<sup>400</sup> Traditional medieval woodsmanship reminds us that it is not only possible but engrained in our history to manage and coexist with the forests in a sustainable manner that benefits the natural environment and sociocultural structures.

Integrating marginalized perspectives in modern forest management practices further prioritizes sustainability within the industry. Environmental history underlines the ability for seemingly contrarian disciplines to harmonize and expand our knowledge. Similarly, TEK and Western science can work in tandem to develop sustainable solutions to meet modern demands for forest products. Indeed, Serra Hoagland states that “science without wisdom is science without a conscious” in her research advocating for the integration of TEK with Western science.<sup>401</sup> She brings attention to the historical ecological consequences of dismissing TEK, including suppression and elimination of controlled burns by Indigenous communities, as discussed in section 3.1.3. Interdisciplinary approaches encourage the integration of TEK with

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<sup>399</sup> Bose, Arun K, Nelson, Andrew S., and Olson, Matthew G. 2020. “Growth and Mortality Response of Forest Regeneration to Partial Harvesting Varies by Species’ Shade Tolerance.” *Canadian Journal of Forest Research* 50 (10): 15-16.

<sup>400</sup> Bose et al., “Growth and Mortality Response of Forest Regeneration,” 11.

<sup>401</sup> Hoagland, “Integrating traditional ecological knowledge with western science,” 8.

Western science by including oral histories from interviews, working directly with communities, and consulting on educational curriculum.<sup>402</sup>

In addition to the ecological benefits to alternative logging methods, research indicates that there are numerous economic benefits as well. Olli Tahvonen concludes that “continuous cover management appears to be optimal if annual sustainable revenues from thinning remain higher than the interest revenue obtainable for clearcut revenues and bare land value.”<sup>403</sup> Essentially, emphasizing the realistic potential for logging companies to consider alternative logging methods without suffering economic losses, and in some instances, reduce operating costs. His research accounts for the covert costs of forest management such as stumpage, reforestation, interest rates in addition to costly ecological consequences of climate change and loss of biodiversity.

Additionally, alternative logging methods continue to highlight key differences between “economically optimal forest management” and “management that maximizes volume output.”<sup>404</sup> Simcoe County Forests of Southern Ontario provide vital insight into this dichotomy of harvesting priorities as they commercially thin between five hundred and six hundred acres of forests annually with the intention to increase light availability on the ground layer.<sup>405</sup> Perhaps more importantly, Simcoe County Forest harvest on shorter intervals of fifteen to twenty years when thinning as opposed to thirty to forty years when clearcutting plantations.<sup>406</sup> Thus, Simcoe County Forests showcases the promising potential for alternative harvesting methods that prioritize sustainability to become more common in Canadian forest management.

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<sup>402</sup> Hoagland, “Integrating traditional ecological knowledge with western science,” 9.

<sup>403</sup> Tahvonen, Olli. 2016. “Economics of Rotation and Thinning Revisited: The Optimality of Clearcuts versus Continuous Cover Forestry.” *Forest Policy and Economics* 62, 93.

<sup>404</sup> Tahvonen, “Economics of Rotation and Thinning Revisited,” 93.

<sup>405</sup> County of Simcoe. 2025. “Forest Management.” *Simcoe County Forests*.

<sup>406</sup> County of Simcoe. 2025. “Forest Management.” *Simcoe County Forests*.

The inclusion of gendered perspectives similarly prioritizes sustainable forest management, both ecologically and economically. Intensive logging practices influenced by hegemonic ideas of nature and its exploitability can be identified as “partially responsible for the insufficiently restocked forest land.”<sup>407</sup> Industry leaders, such as FPInnovations, are working with the Canadian government to develop more sustainable practices like thinning, shelterwood, and other alternatives to clear-cutting. Women contribute one third of FPInnovations’ senior leadership, exemplary of the organization’s core value of “the power of co-creation and diversity” by cultivating “dynamic partnerships through a spirit of openness and courage to challenge ideas.”<sup>408</sup> Research has indicated that forestry organizations can increase their net profit margin by 6 percentage points with at least 30 percent of leadership positions represented by women.<sup>409</sup> Therefore, it is crucial for the sustainability of the forest industry to make marginalized perspectives visible to maintain the health of the forest ecosystem to be able to continue harvesting its resources for commercial purposes.

#### **4.4 Conclusion**

Crevier illustrates that, “one hundred years after the first shipments of navy timber left New Brunswick, half of Canada’s forests east of the Rockies had been cleared.”<sup>410</sup> The modern period of Canadian forestry is influenced from a long history of colonialism and English woodsmanship. Exploitative attitudes that evolved from medieval clearance for cereal crops to early modern colonization of ghost acres form the foundational values and profit motivations of

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<sup>407</sup> Dufour, Jules. 2004. “Towards Sustainable Development of Canada’s Forests.” In *Resource and Environmental Management in Canada*, edited by Bruce Mitchell, 265-286. Don Mills: Oxford University Press, 272.

<sup>408</sup> FPInnovations. 2024. “Who We Are.” *FPInnovations*.

<sup>409</sup> Baruah & Biskupski-Mujanovic, “Navigating Sticky Floors and Glass Ceilings,” 200.

<sup>410</sup> Crevier, “The Making of a Timber Colony” 482.

modern forestry practices. Exploitation of the ghost acres which were extended to Indigenous peoples are “public land,” owned by the Crown, which thus meant the Crown controlled their traditional lands and resources for colonial settlement. These lands are now where most of the Canadian logging occurs and features striking similarities to medieval tensions between common land and Royal Forest.

Indeed, modern uneven-aged silvicultural practices are similar to medieval woodsmanship practices, which emphasized ecological succession. The shelterwood system and partial harvesting system reflect medieval notions of maintaining biodiversity in managed woodlands through unevenly-aged stands. Clear-cutting in the medieval sense was almost always intended to convert woodland to arable land rather than wood harvesting. In contrast, today, clear-cuts are the dominant silvicultural system in Canada. Unfortunately, pushes to transform the modern forest industry have been challenging to implement with concerns over capital losses and high demand.

## **5.0 Concluding Remarks: The Future of Canadian Forestry is Rooted in the English Past**

The health and sustainability of global forests are critical to support evolving relationships between humans and the environment. Canadian forests in particular help supply increasing global demands for forest products such as cardboard, paper, and lumber. The twenty-first century represents a critical period in which sustainability must be prioritized in the forest industry and natural resource management. Annual global demands for paper including cardboard exceeded 270 million tons at the turn of the century compared to only 100 million tons

in the mid-nineteenth century.<sup>411</sup> With many turning to paper or wood as an alternative to single-use plastic, this demand could reach unprecedented levels that demand sustainable management.

Yet, it is not a unique circumstance that modern populations face; people relied profoundly on the forest for survival throughout history and crafted ways to coexist with these ecosystems. Medieval English woodsmanship demonstrates methods of ensuring the sustainability of forest resources by cooperating with natural ecosystem processes rather than controlling them. Modern Canadian forestry practices are confounded by early modern colonial methods of forestry that not only promote the destruction of natural ecosystem processes but also disrupt human-environment interactions that became dominated by anthropogenic natural resource consumption. It is imperative to understand the medieval English legacies of forest governance and resource management within Canada which may be integrated with emerging scientific research and Indigenous TEK to adapt current practices for improved sustainability.

Alternative logging practices are emerging in Canadian natural resource management governance. Medieval English woodsmanship reminds us that it is possible to cooperate with natural ecosystem processes to meet the demands for sustainable natural resources. The shelterwood system, for example, mimics small-scale natural disturbances that can promote biodiversity through regeneration strikingly similar to medieval coppice cycles. By targeting shade tree tolerant species of harvestable age such as the black spruce, natural regeneration can occur with increased sunlight to the forest floor. Commercial thinning is another alternative practice intended to increase the growth rate of commercially valuable trees by only partially clearing the designated area rather than a clear-cut for more space and reduced competition.<sup>412</sup> It is estimated that reduction of approximately 30-40 percent of the tree density within the

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<sup>411</sup> Paillé, *A History of Forestry in Canada*, 30.

<sup>412</sup> Gauthier, "Commercial Thinning to Meet Wood Production Objectives," 511.

prescribed area can produce an increase in tree diameter and tree volume for greater commercial value.<sup>413</sup> On the Pacific coast, for example, thinning of non-commercially valuable tree species like aspen promotes the growth of commercially valuable understory species such as spruce.<sup>414</sup>

It is not lost that these systems present drawbacks relative to current natural resource management perspectives: greater time-consumption, additional or ongoing maintenance, and higher implementation costs.<sup>415</sup> History implores us, though, to face these challenges rather than continue to adhere to exploitative, colonial management values. In 1886, Forestry Commissioner John Henry Morgan wrote that “[t]he inevitable consequences of our neglect will be, among others, climatic changes, droughts, varied by sudden and disastrous floods, and a great deterioration in the quality of soil,” in his *Report on the Forests of Canada*.<sup>416</sup> It is crucial that modern Canadian forestry practices learn from the neglect of natural ecosystem processes in sustainable forest management stemming from its colonial early modern history.

Morgan further cites the poem ‘A Treeless Country’ which reads, “I had a dream that which was not all a dream (...) The logger and the lumberman were dead; the axe had rusted out for lack of use; but all the endless evil they had done was manifested on the desert waste.”<sup>417</sup> Canada is at a critical point to learn from the past towards a more sustainable future where forests continue to promote biodiversity and the health of the planet. Environmental history perspectives must be implemented into forest management practices to ensure the socioeconomic and ecological sustainability of Canadian forests.

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<sup>413</sup> Gauthier, “Commercial Thinning to Meet Wood Production Objectives,” 526.

<sup>414</sup> Groot et al., “A silvicultural systems perspective on changing Canadian forestry practices,” 53.

<sup>415</sup> Groot et al., “A silvicultural systems perspective on changing Canadian forestry practices,” 52.

<sup>416</sup> Morgan, Joseph Henry. 1886. *Report on the Forests of Canada: In Which Is Shewn the Pressing Necessity Which Exists for Their More Careful Preservation and Extension by Planting, as a Sure and Valuable Source of National Wealth: with an Appendix*. Archive.org, 5.

<sup>417</sup> Morgan, *Report on the Forests of Canada*, 2.

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