BEYOND THE SUGAR SHACK: HOW NON-FINANCIAL FORMS OF CAPITAL ARE CONCEPTUALIZED BY SMALL- AND MEDIUM-SCALE MAINE MAPLE SYRUP PRODUCERS

by

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ABSTRACT

Why do people farm? The answers are increasingly unclear given the heightened pressure of agricultural consolidation on small family farms. When profit margins are thin or even non-existent it is necessary to look at how other factors influence this group of people – particularly the social and cultural ties within and amongst communities that inspire people to remain in a profession which is not particularly lucrative. This paper explores conceptualizations of social, cultural, and natural wealth as rationales for continuing in agricultural work, by focusing on maple syrup producers in Maine. At the small and medium-scale, maple syrup production cannot provide substantial income and yet people continue to participate in a time- and labor-intensive activity with marginal returns. This thesis therefore argues that maple sugaring makes an interesting case study through which to explore the various reasons that people take part in small-scale agricultural work with minimal financial benefits.

Drawing on a literature review and 10 semi-structured interviews with both multigenerational and first-generation maple syrup producers in Maine this thesis explores the reasons these producers have chosen to continue or begin maple syrup production, focusing on how the social connections, family history, cultural influence, and ecological factors have impacted their decisions surrounding this business. We argue that while monetary consideration may not be as large of a factor in these decisions, maple syrup producers point to a whole array of motivations which suggest that their returns are linked to human relationship and connections to culture and place.
DEDICATION

This thesis is dedicated to my family.
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INTRODUCTION

With the growing industrialization and consolidation of agriculture in the United States, the question of why people take part in small- and medium-scale agricultural endeavors is of increasing importance. The industrial and mechanical revolutions have provided the changes in social structure and food systems that have allowed most people to leave the farm and obtain their food through purchase. Additionally, this has caused labor necessary to produce the same amount of food to shrink, leading to a decline in farmers. While farming is no longer a necessary practice for most people, many people continue to take part in small- and medium-scale agricultural endeavors. Economies of scale have made this sized agricultural operation much more difficult to maintain financially. Using a case study approach in one particular agricultural sector, maple syrup production, to understand why small- and medium-scale agricultural operators maintain and start their enterprises allows for an in-depth understanding of values and motivations for specific operators in specific areas, rather than simply data collected nationally on the agricultural sector as a whole.

Maple syrup producers make an interesting case study to explore the continued practice of small- and medium-scale agricultural production. Maple syrup can be considered both an agricultural and non-timber forest product (NTFP). It is an eminently temporally- and geographically-limited crop due to its short production season; a six- to eight-week time frame in early spring in northeast North America. In addition, specific climatic conditions must be met for production: warm days and nights below freezing. This is referred to as the freeze/thaw cycle and what makes the collection of sweet sap
possible (Houle et al., 2015). Maple syrup has a strong cultural history in northeastern North America and has been an aspect of farming in the region since settlement, where it was most likely learned from Native American populations (Holman, 1986). Both the long cultural history and seasonality of maple syrup make it a useful case study to understand why people may be taking part in small- and medium-scale agriculture.

Understanding why people take part in a practice requires an understanding of what they value about it. Financial capital is often the most typical understanding of value, but for many people and groups, value encompasses many other aspects besides the financial. Social connections, tradition and history, local ecology, and personal well-being are considered alternative forms of valuation. In Maine, maple syrup production represents an important economic endeavor. In 2017 the value of production in Maine was $23,893,000 USD. Maine is the third highest producer of maple syrup by gallon in the country, following Vermont and New York (USDA-NASS, 2017). While Maine is only the third largest producer of maple syrup, the state does boast two Maple Syrup Producers Associations: The Maine Maple Producers Association (MMPA) and The Southern Maine Maple Sugarmakers Association (SMMSA), with the latter being a subgroup of the former. The third Sunday in March has been designated Maine Maple Sunday by the MMPA, sugarhouses are open to sell their wares and give demonstrations. Due to strong advertising and support from the MMPA, this day is most producer’s highest grossing.

The short length of the season means that for most producers, maple syrup production is only a sideline economic endeavor (Hinrichs, 1998). This suggests that financial valuation cannot be a complete explanation of why people take part in maple
syrup production at the small- and medium-scale. This thesis aims to understand what rationality producers use to stay and begin maple syrup production and that the small- and medium-scale. Alternative forms of valuation provide a way to understand what other factors besides economic are influencing maple syrup producers to start or continue maple syrup production at the small- and medium scales.

The Past

The long history of maple syrup production places it as a culturally important and longstanding tradition in northeastern North America. Understanding the history of the crop provides framing for understanding what role alternative valuation may have in the industry. The long history of maple sugaring suggests a practice that has endured through differing cultural climates and simply the shifts of life in Northeast North America for the past several hundred years. The longevity of the practice in the face of the specific historical events that required the industry to shift means that the history of maple sugaring is necessary for understanding its modern form. Alternative forms of valuation may be influenced by the specific history of maple sugaring.

Maple sugaring refers to the practice of processing sap from the sugar maple tree (Acer saccharum) by boiling, which concentrates the sugars in the sap creating maple syrup. This can be further processed to make granulated maple sugar; maple syrup is the most common form of maple product currently, but historically maple trees were used almost completely to produce granulated sugar (Whitney & Upmeyer, 2004).

Maple syrup is one of the oldest indigenous crops on the continent (Hinrichs, 1995), meaning that information about the production of maple syrup was not imported
from Europe in the way that most of the agricultural knowledge of the time was. During the 1980s there was fierce debate about the reality of prehistoric maple sugaring by Native populations, pointing to the lack of historical records of maple sugaring taking place by Native populations by early Europeans who were in contact with Natives, particularly Jesuit missionaries. The lack of reference to sugaring in Jesuit journals during this time period is used to question the presence of maple sugaring at this early of a date (Mason, 1985). The other issue debated is that of the technology necessary to boil sap into syrup, seeing as metal was only available in North American post-contact. These claims have been refuted. Holman (1986) explained the lack of discussion by Jesuits as a symptom of the indigenous groups they observed. Maple sugaring, due to its labor intensive requirements would only have been practiced by groups who felt the labor was worth the sugar. Another factor would have been the presence of other spring time activities by the group. Sugaring would have only occurred where the season would have fit well into their schedule, such as the Ojibwe. The Huron however, who practiced slash-and-burn agriculture, wouldn’t have had mature forest near their villages to tap, in addition to being consumed with other tasks during the early spring time, a tribe that the Jesuit spent extensive time with (Holman, 1986). The differences in activities between different tribes explain the lack of written record in Jesuit missionary’s journals of the time. In addition to this refutation, birch bark pans and ceramic vessels for boiling the syrup were tested and found to be a viable option for processing sugar, in addition to other practices such as freezing the sap to lower sugar content (Holman, 1986). This shows that a lack of metal technology would not have impeded maple sugar production among prehistoric Native populations. In addition to these points, Native populations
claim that maple sugaring is a traditional practice, and certain tribes have legends about the discovery of maple syrup (Ojibwe, Ottawa, Penobscot, Menominee, and Stockbridge) (Vogel, 1987).

Despite the debate around the prehistoric processing of maple sap by indigenous communities and the origin of the practice, there is clear evidence that maple sugaring was an important practice for many native groups during the historic period. Archaeological evidence in Michigan points to yearly occupation of maple sugaring camps by analysis of boiling arches. Part of the issue with the debate concerning the origin of maple syrup is the difficulty in identifying archaeological evidence that points to maple syrup production. These archaeological sites are from post-contact, because the boiling arches were used to support large metal kettles that would boil the syrup (Thomas, 2005). Maple syrup was an important trade item for Native Americans during the 18th, 19th, and 20th centuries (Whitney & Upmeyer, 2004). During this period sap was collected by traditional native methods, which included creating a gash on the trunk of the tree 3 inches deep and 6 to 12 inches wide with an ax or tomahawk and utilizing several methods to encourage the directional flow of the sap, including shingles placed in the gash or using multiple gashes to direct flow (Nearing & Nearing, 1950). These practices were not healthy for the tree however, and trees tapped in this manner would often die or be left very disfigured as a result of the practice (Whitney & Upmeyer, 2004). The issue of tree death was not important at the time due to the plentiful nature of sugar maples; once a grove had been used completely one would simply move on to the next stand of trees (Nearing & Nearing, 1950).
Maple sugaring as a practice was picked up by European settlers from native populations, starting with the French and then later the English. Maple sugaring wasn’t widely practiced among English settlers until the 1750s (Whitney & Upmeyer, 2004). Maple sugaring soon became an important aspect of farming, providing cash income during a dormant part of the year. Farmers would produce a modest amount for their family and sell the surplus to shopkeepers in town (Whitney & Upmeyer, 2004). Maple sugaring as a practice by English settlers began simply as a means to provide sweetener in remote locations, where transportation was difficult and imported goods expensive. The practice was further encouraged during the American Revolution for the independence and self-sustainability it allowed, patriots were able to obtain their sugar fix without supporting British sugar from the West Indies (Nearing & Nearing, 1950). Sugaring was a practice that often occurred away from the homestead, with settlers traveling some distance to produce the year’s sugar at temporary boiling camps. Sugaring practices utilized by English and French settlers at this time would have been similar to those used by Native Americans, such as those near the Great Lakes (Thomas, 2005), with large open kettles balanced on boiling arches and large gashes made in the trees by axes as well as birch buckets and gathering troughs (Nearing & Nearing, 1950).

The onset of the 18th century brought changes to the maple sugar industry in the form of increased market demands. Maple sugar was becoming an important cash crop, allowing a growth in production. During the 18th century the market for maple sugar began to grow as well as fluctuate. The demand for granulated sugar began to grow during the 19th century, of the estimated 80 million pounds of granulated sugar consumed in the United States in the early 19th century, maple sugar accounted for approximately
12% (Whitney & Upmeyer, 2004). However, the decreasing cost of cane sugar as a result of the Louisiana Purchase and the increasing use of sugar beets as a source of granulated sugar after the 1830s aided in the gradual diminishing of demand for maple sugar over the next century (Whitney & Upmeyer, 2004). Both cane sugar and maple sugar were about equal in demand until the Civil War caused the price of cane sugar to increase, this left maple sugar as the most affordable option. This changed in the 1880s when the increased efficiency of cane sugar production caused the price to drop significantly, creating stiff competition for maple sugar (Nearing & Nearing, 1950).

The growing market for maple sugar during the 1800s allowed for increased participation in the activity as a cash income and maple sugaring became an important aspect of farming in the Northeast. Maple production paired well with dairy farming particularly, occurring at a time of year during which the rest of the farm chores were minimal, allowing farmers to devote considerable time to maple production. Maple sugar provided an important influx of cash income to farmers on often small, marginal holdings (Hinrichs, 1998). Sugaring could be lucrative for farmers, but only if they didn’t count their labor, which during a dormant time of the year, was possible. Maple sugaring is a labor-intensive process, involving tapping trees, hanging buckets, collecting sap, hauling sap to the sugarhouse, and boiling the sap. Farmers usually relied on immediate and extended family for the labor necessary to make the product cost-effective (Hinrichs, 1998).

During the 19th century, changes in technology occurred, allowing increasing efficiency of maple sugar production. In the early 1800s the gash technique to access sap was beginning to be replaced by the use of augers and spiles. However, gashing didn’t
disappear overnight, and the practice was still common in Canada until the 1860s (Nearing & Nearing, 1950). In addition to new technology for tapping, the birch troughs and buckets that were favored by Native Americans, which rested on the ground, were beginning to be attached to the tree to keep large quantities of sap from escaping. Towards the end of the 19th century wooden buckets were being increasingly replaced with tin buckets (Nearing & Nearing, 1950). In the 1820s, Euro-American settlers began switching from large kettles to boil the sap to large flat pans that were much more efficient than kettles because they had greater surface area for the escape of steam (Thomas, 2005). Native American maple producers were not quite as quick to adopt these changes and continued to use their traditional maple processing equipment of kettles and birch containers until the beginning of the 20th century (Thomas, 2005).

By the end of the 19th century granulated cane sugar was much cheaper than granulated maple sugar, causing a marked decrease in the production of maple sugar during the 1890s. Rather than spelling the end of maple production, producers began to switch to producing maple syrup rather than maple sugar. This was due to the increasing luxury status of maple syrup. However, during the late 19th century maple syrup was increasingly being adulterated, with much of the syrup on the market including high amounts of glucose syrup from corn and other cheaper alternatives. The Pure Food and Drug Act in 1906 strengthened the requirements for pure maple syrup, paving the way for maple syrup to become an important luxury good (Whitney & Upmeyer, 2004). The turn of this century marked the shift from maple sugar production to maple syrup production. The demand for maple syrup was further increased by the use of maple products as sweeteners in tobacco products. This demand allowed maple to remain an important cash
crop for farmers in the northeast, particularly Vermont, where on average 19% of a farmer’s gross farm income came from maple products (Whitney & Upmeyer, 2004).

During the early 20th century Canada became the largest producer of maple products, surpassing the United States. Throughout the 19th century the United States had accounted for 70% of the global production of maple products, but by the early 20th century Canada had surpassed the United States in total production, with the majority coming from Quebec. This was due to decreasing production in the United States rather than increasing production in Canada. In the U.S. and Canada, maple has long been associated with farming, specifically dairy farming. Increasingly efficient dairy farming practices, such as the extension of the milking season into winter and early spring as well as improved feeds, were adopted at the end of the 19th century. This left farmers with much less time to devote to maple sugaring. As a result, maple syrup production increasingly became the province of non-farm forest owners (Whitney & Upmeyer, 2004). The decrease in American maple production provided a market to Canadian producers. The American government attempted to alleviate this issue by imposing a tariff between 1909 and 1971 but it was never very successful (Whitney & Upmeyer, 2004).

Technological improvements in the late 20th century helped to offset the labor and time costs traditionally associated with maple production. Tubing, vacuum pumps, and reverse osmosis machines all dramatically increased the efficiency of maple production (Whitney & Upmeyer, 2004), allowing what used to be an entire family affair to be managed by just several individuals. Quebec was able to solidify their place as the lead maple syrup producer by early adoption of these labor-saving devices, which the
government subsidized in the 1970s (Hinrichs, 1998). This increased efficiency shifted the equilibrium of supply and demand, leaving a surplus of syrup, causing Quebec to create a syrup bank as an attempt to even out the uncertainty of production each year (Whitney & Upmeyer, 2004).

In the United States during the late 20th century maple syrup producers shifted from a wholesale-based market to retail. The introduction of the national interstate connected cities and rural areas, allowed producers, specifically in Vermont, to market their syrup as a nostalgia product to tourists from the nearby cities (Hinrichs, 1995). Maple trees must be mature to be tapped, meaning that a sugarbush must already exist for those attempting to enter the business. The most common means of acquiring a sugarbush is by purchase or inheritance. This, in addition to the high cost of technology, has made it increasingly difficult to enter the maple syrup industry and maple syrup production is often undertaken by non-farm forest owners (Whitney & Upmeyer, 2004). Canada remains the largest producer of maple syrup, accounting for about 70% of the global supply, with Quebec producing 90% of that (Statistical Overview of the Canadian Maple Industry 2017). In the United States Vermont produces the most syrup (USDA-NASS, 2017) and has marketed itself over the years to make Vermont Maple Syrup a recognizable brand, which benefits the producers there. Maple syrup marketing now relies heavily on the invocation of nostalgia, with producers designing their sugarhouses to appear more traditional by continuing to utilize wood-fired evaporators rather than oil, use metal buckets rather than plastic tubing, and building wooden sugarhouses that evoke historical designs (Hinrichs, 1998).
The long tradition associated with maple sugaring in New England means that certain producers have a long family history of maple sugaring, providing them with multigenerational knowledge, perhaps influencing their decision to remain in the industry. However, Maine has seen strong growth in new, young farmers in the past twelve years due to factors such as affordable farmland, accessible markets, and strong state support (Curtis, 2014). This suggests that there may be a similar growth in new, young maple syrup producers. These producers would not have the family history of maple sugaring, and the knowledge and values associated with it, suggesting that they would hold different values that encouraged their establishment of a maple syrup enterprise. This suggests that the ways that maple syrup production may be valued outside financial could differ along multigenerational or first-generation lines.

The Future

In addition to providing an interesting case study for understanding the broader issue of why people take part in small- and medium-scale agricultural endeavors, studying maple syrup producers is a time sensitive issue due to the possible impact of climate change on the industry. In addition to being not a particularly lucrative practice, the uncertainty of the future of maple syrup production brings into question reasons for beginning or maintaining maple syrup operations. With this additional threat to production, what else besides financial are producers valuing that would encourage them to begin or continue maple syrup production?

Projected impacts of climate change on northeastern North America are increased temperature and precipitation, as well as decreased snow cover. These factors are all
correlated to maple syrup production, meaning that climate change has significant potential to impact the current maple syrup production season (Skinner et al., 2010). The amount of days with good sapflow during the current maple sugaring season are likely to decrease over the next century. This issue can be adapted to fairly easily by shifting the beginning of the tapping season to earlier in the winter. But this adaptation may not be possible in locations where the current syrup season already begins at the coldest time of year (e.g. Kentucky) (Matthews & Iverson, 2017). Shifting the timing of the season could have both positive and negative impacts on producers. In more northern regions this could allow for a longer season meaning more financial gains, but for other producers who fit sugaring into their yearly schedule, this adaptation could be difficult. Increased temperatures are also expected to negatively impact sugar maple habitat, particularly in the southern and southwestern portions of its region, such as Kentucky and West Virginia where sugar maple habitat could decline significantly (Matthews & Iverson, 2017). In more northern areas these findings were not as drastic, but possible loss of density of sugar maples in any of these areas could have strong impacts on producers (Matthews & Iverson, 2017). For the next hundred years, studies have found that maple syrup production should be able to stay relatively stable in the regions where it is practiced, so far as producers adapt the start of their season (Houle et al., 2015; Matthews & Iverson, 2017; Skinner et al., 2010). But after a hundred years the impacts are unknown, meaning this practice could possibly become obsolete in the next century. This means that now is the time to study maple sugaring and understand its place in Maine should it no longer be a viable practice here.
Research Goals & Objectives

The data used for this study were obtained as part of the larger Sweet Spot Project, which is concerned with understanding how scale management decisions are being made by small- and medium-scale Maine maple syrup producers and beekeepers in Maine. The research was done in close proximity with Dr. Sara Velardi’s work, who is the postdoctoral researcher on this project.

Research about the financial considerations of the maple syrup industry exists, but these have found that while maple sugaring does provide income for many people this income is not large in comparison to the labor expended. Understanding how alternative means of valuation is realized among small and medium maple syrup producers in Maine can help inform rationale for participating in this practice. Using the community capitals framework studied by Flora, Flora, and Gasteyer (2016) four research questions were determined to understand how producers perceived these alternative capitals:

1) How is social capital valued by Maine maple syrup producers, how does it shape operations, and to what extent is gift reciprocity present and used to support social capital?

2) To what extent are other community capitals (cultural, natural and human) present and how do they shape the operation?

3) Are these capitals perceived differently between first-generation and multigenerational producers?
This thesis attempts to understand why people may take part in small- and medium-scale agriculture with minimal financial returns by using a case-study of small- and medium-scale maple syrup producers in Maine. Understanding what factors besides financial motivate maple producers in Maine can possibly help inform what factors besides financial motivate other small- and medium-scale agricultural operators. Using maple syrup as a case study provides a relatively small group of producers who create the same product with similar techniques and practices. The similarity of product between producers allows for focus on the individual rather than the crop. The history of maple syrup production shows how the crop has historically been linked to farming operations in the region and was considered on the many seasonal activities of the year. This history shows us that maple sugaring has survived shifts in demand as well as technological and societal changes to the production, yet it remains an important practice for many. This suggests that there are motivations besides financial. This history is similar to that of other agricultural crops, suggesting that the motivations and values of maple syrup producers could inform the motivations and values of other agricultural operators.

The author of this thesis would like to disclose any possibility of bias in this piece. The primary author is from Maine and has grown up around sugaring operations. While she herself has not taken part in very much maple sugaring, she has done it with family friends once before. She is also from a small rural community in Maine, as many of the participants interviewed were. She would like to acknowledge that these connections may have influenced the piece.
LITERATURE REVIEW

Maple sugaring has a long history in New England (Nearing & Nearing, 1950), occupying both a culturally and financially important space (Hinrichs, 1998). Maine is the third largest producer of maple syrup in the United States. The financial importance of maple sugaring can be measured using quantitative statistical reports (USDA-NASS, 2017), however for individual small- and medium-scale producers maple sugaring is not a substantially lucrative practice. Alternative forms of valuation may influence maple producers’ motivations in addition to financial considerations. Understanding these alternative forms of valuation requires a qualitative approach rather than the quantitative approach utilized for assessing financial factors (Hinrichs, 1998; Lange, 2017).

People in New England have been boiling sap into syrup for centuries, possibly even longer (Holman, 1986). While this may have begun as a necessity for obtaining sweetener, the practice has remained for decades, even after cheaper cane sugar came onto the market. There is something about maple sugaring that people value besides financial returns. The theory of alternative means of valuation presents itself as a way to understand the cultural significance of maple sugaring for Maine producers and allows for inquiry into what else producers may value about sugaring as a practice. The community capitals framework established by Flora et al. (2016) in Rural Communities: Legacy and Change provides a clear structure for analyzing which alternative capitals are present in Maine maple syrup producers’ perspectives and motivations.
Alternative Capitals

Flora et al. (2016) set the groundwork for understanding how seven capitals are present and realized in rural communities across America. Of these seven capitals six are what would be considered alternative capitals, meaning they are ways to measure wealth that is not financial. These six alternative capitals are natural capital, cultural capital, human capital, social capital, political capital, and built capital. These capitals are meant, in aggregate, to represent the holistic value that those aspects of life have for people and communities. Looking at how these capitals interact Flora et al. (2016) analyze the interplay between different capitals. “No capital exists in isolation” (p. 35), and they are capable of influencing or transforming into other capitals through human intervention. In addition, which capital something belongs to is entirely dependent on the person who is deciding and their own personal values. These capitals are not set, but instead a fluid, dynamic framework through which to organize values. Natural capital is perhaps one of the best cases of this. That which it encompasses can often be transformed into other capitals or be seen as belonging to another capital wholly. Take the example of a forest, it can be maintained as natural capital, or for other reasons, such as religious ceremonies (an aspect of cultural capital) or as a place to gather with others (social capital). It can also be transformed into timber through human labor (human capital) and then this timber can become built capital (buildings, infrastructure) or financial capital (money from timber sales).

When looking at maple sugaring, social capital, cultural capital, natural capital, and human capital can be used to understand how sugarmakers attribute value to the different aspects of the sugar making process. Maple sugaring has historically included
strong community involvement. The relationships that sugarmakers have held between each other, their surrounding communities, and their families have historically been used to gain labor, knowledge, and economic support (Whitney & Upmeyer, 2004). This historic presence of social relationships led us to look for social capital among modern sugarmakers. The long timeframe associated with maple sugaring, including the common practice of inheriting sugarbushes and operations, and the tradition instilled into practice suggest that cultural capital may be highly valued by sugarmakers. There is a need, addressed through our research, to evaluate additional forms of capital beyond social and cultural, and specifically the way that these capitals interact and influence one another. Maple syrup production relies completely on the presence of healthy, accessible sugar maples. Additionally, it allows maple producers a way to enjoy the outdoors and still feel productive or provide them a medium through which to enjoy the trees and wildlife, suggesting that motivations may be rooted in the value assigned to natural capital. And finally, physically challenging labor and specific skills and knowledge necessary to produce syrup point to a possible valuation of human capital. Looking at the history of maple sugaring suggests that these four capitals may be valued by maple sugarmakers, meaning this population is ideal to study how multiple forms of alternative wealth may be valued simultaneously.

Social Capital

Of the various forms of capital that we are discussing, social capital often receives the most attention. The ideas that the term embodies have been understood for some time, dating back to Durkheim and Marx (Portes, 1998). In the mid to late 20th century more social scientists such as Bourdieu (1986), and Putnam (1995) began to interact with the
term (Portes, 1998) and it began to see more widespread usage. Bourdieu’s (1986) definition is one of the earliest, appearing in English in *The Forms of Capital*, in which he also defined cultural capital. He looks at these capitals and how they relate to financial capital. Bourdieu holds that the distribution of these different forms of capital at any one time determines social structure. Bourdieu looks at how these different capitals influence each other and also specifically how they can be converted from one into another (p. 4). This is important to keep in mind when thinking of these capitals as distinct entities, there is an obvious blurring of the lines between these capitals, partially due to the impermanence of them.

Bourdieu (1986) focuses on social capital as networks between people and the potential of those relationships to be used to gain things, specifically other forms of capital. These relationships can also be conceptualized as membership in a group; that this membership allows members to leverage their relationships with other members to gain capital (p. 15). Bourdieu believes that social capital accrues more readily the more that one has, and that inherited social capital, such as in the form of a title of nobility, make gaining more social capital even easier (Bourdieu, 1986, p. 18). Social capital has been presented as held within a sole individual and also as a resource held by groups of individuals.

Bourdieu focused on the three capitals of social, cultural, and financial because to him the most important aspect of them was their transmutability. Each capital could in some way be converted into another. Looking at these as sole descriptors is not entirely helpful. It is only when the whole is observed, the capitals and their interactions with each other, that a true picture is clear. Bourdieu’s onset of research into these capitals was
based upon European society and signaled the beginning of research into social capital, which would become an influential idea within the social sciences.

In contrast to Bourdieu’s (1986) attention to European society, Robert Putnam (1995) based his understanding of social capital in America and focuses heavily on civic involvement as a metric for the presence of social capital within groups. Putnam (1995) examines the declining presence of social capital in America in *Bowling Alone: America’s Declining Social Capital*. His main form of data for this book is membership in organizations, groups, and civic associations, specifically ones that require something of the members. While he recognizes they constitute some form of social capital, Putnam is skeptical of more informal groups, such as book clubs or Alcoholics Anonymous where one was not really required to give anything to the group and attendance was not necessarily expected regularly (Putnam, 1995, p. 72). This work has been heavily critiqued on multiple fronts, specifically the basis of the validity of the actual decline in civic organization participation, in addition to the unacknowledged class bias present in his thesis. This work places the onus of lack of civic involvement on leisure, rather than acknowledging the economic factors that may have influenced this decline (Portes, 1998). However, its inclusion in this literature review is important as his was one of the first in-depth evaluations of social capital, particularly in the United States.

In the last twenty years the term social capital has become more widely used to understand how social networks and relations are used by individuals and communities. The scope has also narrowed significantly since Putnam’s book, with researchers focusing mostly on specific groups of people in specific geographic regions. Harrison, Montgomery, & Bliss (2016) use social capital to understand the adaptive capacity of
three towns in the Pacific Northwest. This case study focuses on different aspects of social capital: bonding, bridging, and linking. Bonding within social capital refers to connections between individuals of similar backgrounds, bridging refers to connections between individuals of different backgrounds, and linking refers to connections between a community and individuals outside of that community that have the possibly the impact that community (Harrison, Montgomery, & Bliss, 2016, p. 527). This attention to different aspects of social relationships differs from both Bourdieu and Putnam and offers a much more in-depth look at how social networks can be leveraged, capitalized upon, and accumulated to impact communities and individuals. These authors argue that social capital is better understood in smaller, place-based contexts rather than through large-scale, general musings (Harrison et al., 2016, p. 537).

While this study focuses on how to delineate social capital so that it is a more understandable, useful term neither Putnam (1995) nor Harrison et al. (2016) look into any other capitals besides social. Bourdieu focuses only on social, cultural, and economic capital. To understand what motivates maple syrup producers besides financial concerns social capital is useful, but other capitals may provide additional insight. Following the community capitals framework allows for the combination of Harrison et al.’s (2016) focus on a specific group, but also the transferrable aspect that Bourdieu highlights the importance of. This theoretical combination provides a clearer picture of how value and wealth are perceived, generated, prioritized and transferred by maple syrup producers – looking not only at social capital, but also the values derived through natural, cultural, and human forms of value as well.
Gift Reciprocity

Social capital, as it is understood as the networks and relations between individuals that can be utilized to gain goods, favors, and other forms of capital, is often supported by gift reciprocity. Gift reciprocity refers to the practices surrounding gift giving and the expected returns these create. Marshall Sahlins (1972) divides this concept of reciprocity into three categories: generalized reciprocity, balanced reciprocity, and negative reciprocity. These three terms can be conceptualized in terms of the intensity of which a return is expected. General reciprocity is the least stringent, where return is not expected, only appreciated. It is particularly attentive to the capability of the one who owes the debt to pay that debt. Balanced reciprocity is about equality of exchange, in which return is expected in equal value. In the purest form this return is expected at the same time as the giving, but Sahilns notes this does not occur frequently. Negative reciprocity is the most demanding, with each individual involved in the interaction attempting to gain the advantage. Sahilns defines this as the exact reciprocity included in barter, but the term barter can be looser, and also involve an interaction more similar to balanced reciprocity. Reciprocity has been studied by anthropologists for a long time, one of the most famous accounts is by Bronislaw Malinowski’s (1984 [1922]) discussion of the Kula Ring trade in western pacific islands. Malinowski found that the gift giving of arm bands and necklaces in this society was an incredibly organized practice that had specific rules that must be adhered to and was very intertwined with the political structure. In this case it was not the physical arm bands and necklaces that had any value, but the relationships that were fostered and maintained through the conference of these goods. In this case the ceremonial gift giving was used to strengthen the relationships that
could then be used to gain additional goods, or social capital. Marcel Mauss (1945) also explores the concept of gifting, specifically among the tribes of the pacific northwest. Mauss focuses on the potlatch, which is a ceremony in which those who take part compete to give away the most. Once again in this case, the act of giving a gift was used to strengthen one’s position within the tribe, similar to Bourdieu’s concept of social capital and its relation to nobility. Both of these early researchers found gift reciprocity to have an important place in these ‘primitive’ societies and the social capital present in these communities.

In Rural Communities, gift reciprocity is explored as a means to support and maintain social capital. The long history of gift reciprocity as an aspect of social cohesion, as seen by the above examples, made this an area of particular interest. None of the reviewed maple sugaring literature focused on gift reciprocity as an activity undertaken by sugarmakers, Whitney & Upmeyer (2004) mention it as a historical practice, but do not comment on any modern incarnations. There is some literature on the presence of gift reciprocity and sharing among farmers. Rissing (2016) examines the practice of bartering and equipment sharing among small-scale beginning farmers in Iowa, finding that for many bartering was way to access goods that wouldn’t be possible to purchase through typical financial means. Gerbasi (2004) mentions bartering as an important aspect of a farmer’s market in Athens, Georgia, where the farmers utilize first and secondary barter to access goods that might otherwise be too expensive to warrant a cash purchase. Secondary bartering referring to the practice of bartering for a good specifically with the intention of bartering or selling it at a later date for a profit. Sharing, which falls under balanced and generalized reciprocity, has also been observed among
farmers, specifically with seeds and equipment. Carolan (2018) detailed practices of seed sharing and saving as part of an organization in northeastern Iowa. Pottinger (2018) discusses a more informal seed sharing among neighbors in the UK. Artz & Ginder (2010) tackle equipment sharing at the large scale whereas Rissing (2016) discusses it as an integral aspect of small-scale beginning vegetable farmers in Iowa. The observance of these forms of reciprocity between farmers, the attention given to gift reciprocity by Flora et al. (2016), the historical presence of trading and bartering (Whitney & Upmeyer, 2004), and several informal anecdotal stories of gift reciprocity within the maple community led to its inclusion in our research questions.

Cultural, Natural, and Human Capital

Understanding cultural capital can also begin with Bourdieu (1986), who suggests that it exists in three different forms: the embodied state, the objectified state, and the institutionalized state. These generally refer to the “…long-lasting dispositions of the mind and body…cultural goods (pictures, books, dictionaries, instruments, machines, etc.)… educational qualifications…” (p. 5) respectively. Bourdieu focuses on cultural capital from an educational standpoint, beginning his understandings of it as a way to explain unequal scholastic achievement. Of the capitals discussed by Bourdieu, cultural capital in the embodied state was the most difficult to transmit between individuals. The most frequent means of cultural capital transmission was hereditarily through the familial line.

Flora et al. (2016) see cultural capital as slightly more holistic term, or as a determinant of “…how communities and groups within them see the world, how they
explain what they see around them, and what they think possible to change” (p. 35). Cultural capital is embedded into the community, and it is passed down to children through several methods, including school, parental views, or religious teachings. These views which the community holds, allows the community to understand and label who they are and what is important to them as well as who is not a member of their community. It can further be understood as the filter through which people see their world and influences how they see things. Those with differing cultural capitals may view the same thing in a very different way. For Flora et al. (2016) cultural capital includes strong ties to family and passage of knowledge through family such that, “Parents seek to provide children, that according to their world view will enhance their survival” (p. 78). This could be influencing what a child considers to be important to their survival or encouraging them to follow a particular path that the parents see as beneficial.

Natural capital refers to “…the air, water, soil, wildlife, vegetation, landscape, and weather that surround us and provide both possibilities for and limits to community sustainability” (Flora et al., 2016, p. 35). Natural capital in other words is the earth, and subsequently forms the basis for all of the other capitals. Natural capital is in some ways one of the most transmutable of the capitals, in American history natural capital has been transformed into cultural capital by Native Americans through the process of religious rituals and by colonists into financial capital as they developed the land (Flora, et al., 2016, p. 38). Maple sugaring historically was a way of converting natural capital into financial capital by harvesting sap to turn into sugar which was a commodifiable product (Whitney & Upmeyer, 2004). Natural capital has been and is still to some extent viewed only by what it can become. This research is concerned with determining how producers
value natural capital, whether it be only what it can be turned into (social, cultural, financial capital) or for itself, meaning their access to outdoors, including the trees, air, and wildlife associated. Natural capital is usually studied in conjunction with other capitals. Kenny (2017) studied how social capital and natural capital interplayed when it came to farm modeling as a tool to assess risk. Natural capital is an inherent aspect of agricultural or forest labor and may be an important source of value to producers outside of economic.

Human capital refers to the “…assets each person possesses: health, formal education, skills, knowledge, leadership, and potential” (Flora et al., 2016, p. 110). Another way of looking at this is as the knowledge to perform a certain job. It is clear from the history of maple sugaring that there is specific knowledge required to sugar successfully and the sugaring knowledge is often passed down through generations (Lange, 2017), meaning that cultural capital can be transformed into human capital in the form of this knowledge and skills. It can also be gained through social connections (Lange, 2017), meaning that social capital can be transformed into human capital in this case. Another important aspect of human capital is labor. Human capital can encompass both the labor of that individual as well as utilization of someone else to do that labor. In addition to the skills and labor of an individual, human capital also encompasses the health of that individual.

Using these four capitals to understand how Maine maple sugarmakers value their operations and the ways in which these capitals interact with each other is important. There is no isolation of these capitals. They can shift from one to another as well as both encompassing the same thing in certain ways. By looking at these four forms of wealth or
capital, a more complete picture of what maple sugarmakers value, besides financial concerns, emerges.

**Maple**

Scholarly research into maple sugaring is limited, particularly research concerned with the meanings associated with maple sugaring. There are many papers that focus on the scientific aspects of maple sugaring. With the threat of climate change multiple papers have been written on the expected impacts on maple sugaring including Skinner, Degaetano, & Chabot (2009); Matthews & Iverson (2017); and Houle, Paquette, Côté, Logan, Power, Charron & Duchesne (2015). These papers are concerned most notably with the impact that warming temperatures will have on the start and duration of the maple sugaring season, as well as the impacts of these changing temperatures on the density of sugar maples.

Papers that focus on meanings are much scarcer. C. Clare Hinrichs’s doctoral work during the 1990s with maple syrup producers in Vermont and Quebec is the first instance of scholarly attention be paid to this group. Hinrichs’s (1998) paper *Sideline and Lifeline: The Cultural Economy of Maple Sugaring* deals directly with how cultural factors play into maple sugarmakers decision making and perceptions of the activity. Maple sugaring is a seasonal activity, occurring only during late winter and early spring, Hinrichs explores how this seasonality affects producers, placing it in its historical origins as a farm activity that occurred during an otherwise dormant part of the year (Hinrichs, 1998). Hinrichs also places this activity in the sphere of the forest as a non-timber forest product (NTFP), comparing it to other minor resource NTFPs gathered. She finds that while there is a historical connection between farming and maple sugaring,
increasingly non-farmers are taking up the practice, particularly those who are looking for a retirement venture. This article focuses on several of the values that we have identified as being of importance to sugarmakers: social and cultural, but with an additional strong focus on financial. This article is the base of how certain (social and cultural) alternative capitals can interplay with financial capital, leading to our work that steps outside the financial sphere completely and focuses solely on the interplay between alternative capitals. It is important to note that Hinrichs does not utilize the terms of social, cultural, or economic capital, but refers to them in a broader sense of meaning. This work is more economically centric, with social and cultural factors being explored as how they relate directly to the economic aspects of maple sugaring. A key concept for Hinrichs is ‘embeddedness,’ or the idea that certain practices are embedded into the social and cultural fabric of a community or region, which she argues maple sugaring is in Vermont and Quebec. Hinrichs represents an early attempt to understand cultural and social aspects of sugaring, but her work is somewhat limited, and is only done in Vermont and Quebec, the two largest maple syrup producing regions in the world. To this date there is no scholarly work done on cultural and social aspects of maple sugaring in Maine, representing a clear opening for engagement with the topic. Maine does not have the same statewide attention to maple syrup that Vermont does. Researching maple syrup in a state that does not have the national acclaim of Vermont may provide differing attitudes and perceptions.

Whitney & Upmeyer (2004) detail the history of the industry. While not concerned with specific meanings, they do provide insight into historical perspectives and mention modern ones but are more concerned with the topic of sustainability as a whole.
The historic nature of maple sugaring, and uncertain future of the practice are discussed. This article is very broad in scope and discusses the multitude of differing aspects of maple sugaring including its historical roots, economic importance, ecological ramifications, as well as cultural aspects. The social and cultural attributes discussed in this article are somewhat brief, but the combination of other attention given to the labor and ecological aspects of tapping make it similar to the research objectives of this project, combining social, cultural, natural, and human attributes of maple sugaring into one paper.

Michael Lange’s (2017) *Meanings of Maple: An Ethnography of Sugaring* takes a deep dive into the practice of maple sugaring and what it means for producers in Vermont. It is the most comprehensive work mentioned here. Lange explores six distinct meanings of maple: economic, culinary, geographic, ecological, agricultural, and heritage. He approaches each of these meanings separately but ultimately presents a unified picture of how the different aspects of maple sugaring go together. While this book is based heavily in Vermont, he also discusses other regions that produce maple syrup, including Maine. This book is somewhat more about the actual story of maple sugaring, and less of a scholarly paper written on the producers. However, it is a very thorough book that addresses very similar issues to those brought up by this research project. The attention to place in this book suggests that research done with a less place-based framework, may be more applicable to sugarmakers everywhere, rather than in one region of syrup production.

Literature on how maple syrup is valued in ways besides financial are scarce, the literature reviewed above constitute the bulk of the available literature. The geographic
limit to the range of maple sugaring means that there are less people to study it. It can be likened to other non-timber forest products, but the longevity of maple syrup production and the hereditary aspects of knowledge and operation transfer lend it a unique cultural importance. Understanding how this may be true in Maine, a state that is similar to Vermont and Quebec geographically in some ways, but that has a much stronger emphasis on maritime industries, which can usurp focus on forestry and forestry products, can allow us to broaden our understandings of the perceptions of maple syrup producers towards sugaring and their valuation of it.
METHODS

Valuation is a complex topic, and for every person means something different. To properly understand how and if Maine maple syrup producers are valuing alternative forms of capital a qualitative approach is the most logical. Qualitative research methods allow for the individual to express their own feelings on the matter and the nuances of how each capital is valued can be explored much more in-depth than through a quantitative approach. Following a qualitative approach allows for more fluidity in data collection and review. Semi-structured interviews rather than surveys allow for respondents to express their own personal nuances and coding can then identify possible new themes from this.

The research questions concerned with the presence of alternative capitals were used to create eight open interview questions, four concerned with social capital, four concerned with cultural capital, one concerned with natural capital, one concerned with human capital, and one concerned with gift reciprocity. Several questions were concerned with more than one capital (Appendix C).

In addition to using research questions to understand how cultural capital was valued, producers were divided into two separate groups based on their status as a first-generation or multigenerational producer. This was done to understand how the producer’s own cultural capital (childhood experience and familial knowledge) might influence how they valued other capitals. These terms were meant to mean for a first-generation producer someone who has no family history of maple sugaring and started their own sugaring operation. Multigenerational was meant to refer to producers who had
a family history of maple sugaring and had perhaps inherited their sugaring operation. Producers were asked to self-identify as either first-generation or multigenerational. The history of maple sugaring in the region suggested that there would be producers with familial knowledge, additionally the increase in young, new farmers in Maine suggests there will be producers who are new to maple sugaring. Five first generation interviews were used, and five multigenerational interviews were used, making it an even split between the two groups.

Twenty-five total interviews were conducted using these questions, labeled MS1 through MS25 in chronological order, indicating when the interview was conducted. Interviewees were found through membership association and licensed state producer listservs, through which recruitment flyers were sent (Appendix D). Producers were delineated based on their size, being classified as a small-scale producer if they had between 0 and 300 taps and classified as a medium-scale producer if they had between 300 and 4000 taps. The primary author was present for ten of the interviews and utilized data from ten of the interviews conducted. Preference was given to interviews conducted by the primary author, but in three cases interviews conducted solely by Dr. Velardi fit very well into the first-generation or multigenerational categories and replaced interviews conducted by the author that did not fit well into this distinction. These interviews either did not express much concern with their generational status or they did not align very well with their self-identification as either first-generation or multigenerational. Interviews were only selected based on these two criteria. The interviews used that the primary author was not present for were MS9, MS17, and MS21, the interviews that the author used that she was present for were MS2, MS3, MS6, MS13, MS19, MS20, and
MS23. These interviews were conducted from mid-August to early October and were done almost exclusively at the producer’s house or sugar shack, except for one exclusion.

Interviews were recorded using a digital recorder and later transcribed using Trint automated transcribing software (www.trint.com), which required manual editing. These interviews were exported as Microsoft Word files and then uploaded to NVivo 12 for Mac to be coded.

Coding began as open coding, meaning that no codes were created prior to the first round of coding. First round coding consisted of reading the transcripts with the research questions in mind to inform the direction and relevance of the codes that were created. First round open-coding produced 38 different codes and no hierarchies. Second round coding began with the creation of four top tier codes:

- Social Capital
- Cultural Capital
- Natural Capital
- Human Capital

These four codes were then used to organize the codes generated during the first round of coding. Codes that were similar were also combined throughout the second round of coding. This organization allowed for codes that had appeared but did not pertain to the specific research questions and goals to be deleted. Second round coding consisted of rereading the transcripts with coding stripes visible to verify the information coded in addition to a continual merging of codes. Second round coding also saw the inclusion of definitions for the different codes. By the end of second-round coding the codes had been cut down to 18 and now utilized a hierarchical structure with each code falling within one
of the four top tier codes that represented the four alternative capitals being researched. This was done to organize the codes and ideas they represented into the capitals that they applied. Everything coded at a lower tier (3 or 2) would be found in a higher tier (1 or 2) that it belonged to, but higher tiers would contain codes the lower tiered codes did not. An example of this is ‘Maple Community’, a third-tier code, everything that was coded as ‘Maple Community’ was also coded as ‘Community’ and ‘Social Capital, since it is a subset of those broader codes. Likewise, everything was coded as ‘Community’ was coded as ‘Social Capital’, but not everything that was coded as ‘Community’ was found within ‘Maple Community’ and not everything coded as ‘Social Capital’ was found within ‘Community.’

Figure 1: Depicts the hierarchical relationship of the codes, with the example of social capital family of codes.
Third round coding consisted of reading through each code to make sure that the specific phrases coded were applicable and un-coding any codes that did not fit with the category well enough. Third round coding also saw the merging of three codes, “Specific Knowledge,” “Health,”, and “Organic,” as the information in them was not separate enough from their higher tiered codes (“Cultural Capital,” “Human Capital,” and “Environmental Concerns” respectively). This resulted in the fifteen final codes and definitions:

<table>
<thead>
<tr>
<th>Node</th>
<th>Tier</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Capital</td>
<td>1</td>
<td>This includes references to learning, family history, or traditional life ways, be it sugaring or otherwise.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Particular attention to childhood experiences.</td>
</tr>
<tr>
<td>Childhood Connection</td>
<td>2</td>
<td>This code is for references to sugaring as a child, whether it be casual or more serious.</td>
</tr>
<tr>
<td>First Generation</td>
<td>2</td>
<td>References to starting in maple sugar production. Includes benefits and disadvantages.</td>
</tr>
<tr>
<td>Multigenerational</td>
<td>2</td>
<td>References to a continued maple syrup production through familial generations. Mostly refers to ancestors, but in certain cases could also be for younger generations.</td>
</tr>
<tr>
<td>Tradition</td>
<td>2</td>
<td>References to a historic way of life, particularly in reference to maple sugaring.</td>
</tr>
<tr>
<td>Human Capital</td>
<td>1</td>
<td>Includes references to labor and health.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This can include both labor of the producer, finding additional labor, and health considerations.</td>
</tr>
<tr>
<td>Labor</td>
<td>2</td>
<td>References to finding labor in addition to the labor of the producer.</td>
</tr>
<tr>
<td>Natural Capital</td>
<td>1</td>
<td>Includes references to environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can include considerations of environmental concerns, tree stand health, the impact of the environment on sugaring, as well as lumber harvesting or other uses of woodlands.</td>
</tr>
<tr>
<td>Environmental Concerns</td>
<td>2</td>
<td>Broad references to environment in any way, not necessarily relegated to maple. Could be a reference to anything environment related.</td>
</tr>
<tr>
<td>Code</td>
<td>Level</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sugarbush</td>
<td>2</td>
<td>Specific references to natural capital in the form of the producers sugarbush, including health of trees and measures taken to ensure productivity of trees.</td>
</tr>
<tr>
<td>Social Capital</td>
<td>1</td>
<td>Includes references to community, local, regional, state, maple specific, or online. Focuses on interactions between producers and members of their communities and how they perceive that.</td>
</tr>
<tr>
<td>Community</td>
<td>2</td>
<td>Broad references to community. This includes former codes for business community, non-local community, state community, family and friends, and knowledge sharing. These categories are all a part of the idea of community and often overlap with each other, resulting in a single large code for community rather than smaller more specific codes.</td>
</tr>
<tr>
<td>Local Community</td>
<td>3</td>
<td>References to a local community, place within that community, and the involvement of that community.</td>
</tr>
<tr>
<td>Maple Community</td>
<td>3</td>
<td>Broad references to community of other maple syrup producers. Also includes references to specific sugar makers, as a means of tracking for how much other producers are on their mind.</td>
</tr>
<tr>
<td>Gift Reciprocity</td>
<td>2</td>
<td>This includes all references to trading, bartering, or giving.</td>
</tr>
</tbody>
</table>

Table 1: Codebook. Bolded are first tier codes, italics are second tier codes, and underlined are third tier codes.

The occurrence of these four upper tier codes was used to understand how producers consider these forms of alternative capital, with the other eleven codes providing further understanding of what specifically within these alternative capitals producers are referencing and concerned with.

Intercoder reliability was completed by Dr. Sara Velardi, coding was agreed upon 70% of the time.
RESULTS

The aim of this study was to understand what Maine maple syrup producers might be valuing outside of the sphere of financial considerations. Using the community capitals framework (Flora et al., 2016), the literature review suggested four alternative capitals as having a strong possibility of being present among Maine maple syrup producers’ valuations. These capitals were social, cultural, natural, and human. The presence of these capitals in Maine maple syrup producers’ valuations was investigated through the use of semi-structured interviews with questions designed to gain answers pertaining to each capital.

Cultural capital was investigated slightly differently than the other two, as the interviewees were split into two groups of different producers, first-generation or multigenerational, in a further attempt to understand how childhood experience and familial knowledge might influence if and to what extent these capitals were present. This organizational division is to demonstrate how the differing cultural capitals of these two groups may have impacted their concerns about these alternative capitals. There is strong overlap between many of the capitals, and many phrases were coded as more than one capital. This slippage between the capitals makes sense in the light of Flora et al.’s (2016) assertion that “No capital exists in isolation” (p. 35).

Figure 2 shows the difference between first-generation and multigenerational producers’ expressions of the four capitals. This data expressed is the percentage of total expressions of the capitals for each group. This information was obtained using Nvivo 12, which provided the percentage of each interview coded as a certain capital. These raw
percentages were then added to obtain a total amount of expression of all four capitals. This was done separately for both first-generation and multigenerational, resulting in two totals. These total expressions were then used to determine the percentage of each capital as a part of the total expression. The expression for each capital was divided by the total expression for all four capitals for that group to obtain these percentages. For both first-generation and multigenerational producer’s social capital accounted for over 50% of total expressions of capitals.

![Expression Of Each Capital by First-Generation and Multigenerational Producers](image.png)

Figure 2: The average expression of each capital between first-generation and multigenerational producers

The aim of this study was simply to determine if these capitals were a concern to Maine sugarmakers. Due to this, concerns for these capitals were coded both positively and negatively without distinction between the two. The results show that every producer was concerned with these alternative capitals to some extent, and many valued them in certain ways.
In an attempt to answer the third research question, “Are these capitals perceived differently between first-generation and multigenerational producers?” the difference in expression for each code were determined. This was done in the same way that the data for Figure 2 was obtained. The raw frequency of each group for each code was added to find the total expression for each code. This total expression was then used to determine percentage expressed by each group for each code. This was done by dividing the raw expression for that group by the total expression for each code. Seven codes had a difference of over 5%. These data are shown in Figure 3, from left to right in order of the largest difference.

Figure 3: The seven codes with a difference of over 5% of expression between first-generation and multigenerational producers
Social Capital

Of all the capitals social capital was expressed the most frequently, it was split fairly evenly between first-generation and multigenerational. This capital referred to the community and relationships that maple syrup producers had, and specifically those that they could leverage for their gain, whether that be labor, marketing, knowledge, or anything else that they considered an asset to their operation. There was overlap between social capital and human capital when it came to the usage of social capital to obtain human capital.

Community

Community on the whole was very important for sugarmakers. For many producers, community was a broad term that encompassed many different forms, these included neighbors, other maple syrup producers, friends and family, state organizations, and online communities. These relationships could all be used to gain benefits, and many producers spoke about that. One of the most frequent ways that producers leverage their community relationships was for labor, whether that be through family…

*Our daughter's at school. Granted last year she came home for spring break and she was running my maple store and she was doing great... so we put her to work when she was here.* MS21, multigenerational

*But just three kids they work in this. My sons two kids my daughter's two kids. They all pitch in and they're all very interested in it, at different levels.* MS23, multigenerational

*Or friends...*

*Building the sugarhouse, the friends that I had down there, a lot of the really good friends, this is how we get together now...It's brought that group of friends that I just didn't have time for that, I mean we hung out with them a little bit, but not nearly as much as we used to. It's brought them all back...* MS6, first-generation
...when I was in high school in my younger brother, he was in elementary school and then we had a buddy of mine and a friend of his who was a year or so older than him. And the four of us would jump into pick-up when we get home from school cause I had a license and we picked up all the sap and we'd start boiling it... MS3, multigenerational

...buddies come over hang out have a couple of beers in the sugarhouse, listen to music, listen to the hockey game, so people, you know, a lot of people pretty willing to help. MS9, first-generation

While discussions of friends and family were a very obvious connection between community and social capital and how producers used their relationships to further their businesses, producers also made connections with state organizations and producers. These networks could then be used to gain knowledge from experts when needed. Producers spoke highly of their ability to reach out to those who were in some ways considered experts in the field.

I ended up calling Kathy Hopkins from cooperative extension. So, I was on the phone with her for quite a while. She explained it to me. MS21, first-generation

He's obviously a salesperson at the end of the day but he's is extremely helpful because he's been there and done that for most everything so yeah. Those guys are very helpful even though they're obviously trying to sell stuff. But they know that we're like the frugal sugar makers, so they don't like push anything. MS17, multigenerational

Community also involved other connections producers had made that were used to market their syrup, for many producers finding the right market was of the utmost importance, and in many cases, producers attempted to enter these markets utilizing their social capital. One producer used his relationships with other members of a farmer’s market to get a spot at a better farmer’s market where he would have a better chance of selling his syrup.

So, I'm, luckily there was a few of us at the Scarborough market that we all kind of came in at the same time and Scarborough and two of them had getting into Kennebunk and Kennebunk is a fantastic market. MS3, multigenerational
Other producers utilized the variety of relationships they had with potential buyers, usually large-scale buyers, to set their syrup apart and secure accounts.

*I try to work with Unity College. I work with the guy that runs the store over there in Thorndike. College buys syrup from us for the cafeteria.* MS23, multigenerational

*We are in talks with Grandy Oats. They use a ton of maple syrup. But they buy much cheaper than it's really great for our bottom line, but we're still talking with them, because they used to be like right across the road, and we know them, so that's helpful.* MS2, first-generation

Community involvement in their sugaring operation motivated many producers. They spoke about how they enjoyed having members of the community visit them and how educating on the subject was very important to them. These community members purchased syrup and supported producers this way, but for many producers it was more than just the interaction between a supplier and customer, that the interactions they were able to have with those who bought their syrup were part of the experience. The relationships they formed with their customers was important to them.

*So, we try, I use it as a teaching tool just so that I can get adults and kids to help and see where their food comes from and such.* MS19, first-generation

*And if anybody comes to the sugarhouse, I'm always willing to tell them because they're so intrigued by the process.* MS20, first-generation

*People come here to maple syrup weekend and they ask questions and it's fun to answer.* MS23, multigenerational

A smaller aspect of the community, but still important for some producers were online communities. Some producers remained skeptical about the place of online interactions, but several producers took part in online communities regularly. These included websites and blogs dedicated to maple sugaring, but also involvement in Facebook and other social media sites as a means to advertise their product, their Maine
Maple Sunday events, or simply to communicate with other producers and the community as a whole. Online community was usually expressed by these producers as having many people that were new to maple sugaring, and those who took part in forums often described themselves as being the ones providing information, but some said they had learned from forums.

*I had a gentleman who asked me, actually messaged me on Facebook, looking for some information setting up a hybrid wood system, hybrid vacuum system and I helped him out.* MS9, first generation

*And then you know I’m active on, sort of active on like a maple forum so I kind of just like to read about what people are doing.* MS17, multigenerational

Maple Community

One of the biggest aspects of community for maple syrup producers was their access to a community of other maple syrup producers. This was one of the areas in which first-generation producers were more concerned with than multigenerational producers, mentioning maple community around a quarter more than multigenerational producers. One of the largest aspects of the maple community for producers was the two maple associations in Maine; the Maine Maple Producers Association (MMPA) and the Southern Maine Sugarmakers Association (SMSA). Every producer interviewed was at least a member in the MMPA, most so that they could be included in a map that the MMPA published every spring for Maine Maple Weekend that listed sugarhouses taking part in Maine Maple Weekend activities. For producers this map was a huge reason for joining the association.

*It was an opportunity to have more information, to make a connection and also it was pragmatic, you can't do Maple Sunday without joining.* MS13, first generation
Producers also mentioned frequently the knowledge that they gained through membership in these associations, and simply through the maple community. In this way producers used the relationships they had with other producers from being members of the same group to gain knowledge that would have been hard to access otherwise. This was certainly true for first-generation producers, but also for multigenerational producers whose family wasn’t at the level that they were or didn’t use the same technology, or other reasons.

*But it mostly just by going to meetings and being able to bounce questions off people.* MS19, first-generation

*And, I don't go to a meeting at Southern Maine I don't know, meeting up to Maine Maple that I don't learn something every single month when I go. You can think you know it all. Just because you've been doing it for 50 years, but you don't know everything, and you get to be open to new ideas and all that stuff.* MS3, multigenerational

Membership in the associations didn’t only provide information to producers, but in several cases, producers also utilized relationships gained through these associations, or other ways to share resources with other producers. Several producers spoke about how these relationships meant they didn’t have to invest in an expensive piece of equipment, they could simply borrow it.

*...instead of buying a three hundred-dollar tool I was able to borrow it from somebody else and use it for 10 minutes and then give it back.* MS9, first-generation.

For some producers simply the sense of comradery and understanding they received from other maple producers was helpful. Most producers did not feel that there was a sense of competition between other producers.

*I think in general maple producers are pretty open to helping and teaching and chatting with folks and nobody, I have not run across anybody who's like had this closely guarded secret that they wouldn't...* MS19, first-generation
Producers expressed that while other members of their community supported them, that in certain ways the support they received from the maple community could be most helpful. This was sometimes in reference to the fact that maple is a time-consuming practice when it is occurring, taking up large portions of the day with collection and boiling and checking on taps. There was a sense that until one had experienced it, they could not completely understand, making the support of and membership within a maple community even more important. For first-generation producers, and some multigenerational producers, maple syrup production had impacted their friendships, for many first-generation producers it had brought new friendships.

Local Community

In addition to the relationships gained through maple associations and other maple connections producers focused on their local community as an important aspect of their operations. In comparison to maple community, local community was more important to multigenerational producers, who expressed it around 16% more than first-generation producers. Many producers relied on their local communities to contain loyal customers. Connecting with their neighbors was an important aspect of local community, particularly when it came to Maine Maple Weekend, multiple producers recounted meeting neighbors at Maine Maple Weekend events held in their sugarhouses. For some producers who were new to the area, not just maple sugaring, this was a way to connect with neighbors who had seemed difficult to approach and reserved before.

*You know a lot of the folks that come by on that weekend are neighbors that I've not met. Mainers, you know Mainers are really different, they're really quiet and you know the first year we were here. We took around Christmas cookies, to sort of the neighbors and they're like 'Why are you here? It's kind, but...' So, they come by a bit and I*
mean I've got, I can't tell you how many people that come by and say you know we're neighbors, I live three doors down I've never met you before. So, it's made some connections that way. MS13, first-generation

These relationships with neighbors were important to some producers because they were very logical customers. Producers were interested in having customers that were nearby because it was convenient for them as well as the customer.

We're like, all the people that live on this road, they buy maple from us… MS2, first-generation

Many producers felt that their local community contained very loyal customers, which was an incredibly important demographic for them. Producers were very concerned with finding and keeping repeat customers. In addition to branching out into new markets, such as tourists, producers really wanted to grow their loyal customer base.

...repeat customers are where the majority my businesses is. MS6, first-generation

So, they're very loyal, very loyal customers, keep coming back. That's what keeps us in business. MS3, multigeneration

Gift Reciprocity

In the literature we reviewed, gift reciprocity is referenced as a way to support social capital, or the network of relationships that could be utilized to gain access to goods, knowledge, and other needed things. Looking for gift reciprocity included charitable donations as well as bartering and sharing that producers took part in. Both first-generation and multigenerational producers took part in these activities without a significant difference towards one group or the other. The biggest occurrence of gift-reciprocity among sugarmakers was trading maple syrup and other maple products for
access to sugar maple trees to tap. Every producer that leased trees (whether some were formal or informal) utilized a syrup for taps kind of situation.

So, at the end of the season I just circle by with a bunch of syrup and they're very happy. MS13, first-generation

I mean last year I gave them syrup, candy and whoopie pies, or something like that...But it's easier to, they like maple syrup and they don't like paying for it. So, you bring them that and a couple of goodies and they're happier now usually. MS6, multigenerational

Some producers had either offered people money to lease taps and had been rejected in favor of syrup, or they had a system in which they paid for taps using both money and maple syrup.

We also trade them with product and they've already used their money for all of our maple syrup. So that's kind nice, cause it's like a trade in. MS2, first-generation

I offered to pay the people money, they don't want money, they want syrup. MS3, multigenerational

By giving those who they leased taps from maple syrup rather than a specific amount of money producers felt that they were able to maintain more convivial relationships with landowners. This can be conceptualized as balanced reciprocity, there is a clear expectation of return on the gift that is given, whether that be the usage of land or the maple syrup. Exchange does not occur at the exact same time, but reciprocation is necessary to keep the relationship going.

Another way that maple syrup producers used gift reciprocity to support their operation was by trading for labor. This was less of a clearly understood exchange and could be seen as an example of balanced reciprocity, but more generalized than with the tap leases. These producers suggest that their gift of maple syrup is less expected than in the case of tap leases.
You know, I had a couple guys that went, they helped me pick up a tank, I gave them a half gallon of syrup. And they're just friends of mine anyways, but they took time out of their day. MS6, multigenerational

So really, you know, the help that I have throughout the year I gift them syrup at the end of the year and they put in a lot of time and effort. A lot of times it's just kind of coming out hanging out and keeping me company. MS9, first-generation

Producers also mentioned trading their product for food or other goods. Maple syrup is a luxury product, and producers were able to leverage that to gain access to services and goods that might have been financially difficult to obtain. Bartering is a form of negative reciprocity (Sahlins, 1972) in which each individual is attempting to get the best deal. Several producers noted that their syrup had no value until they were able to find someone to pay for it, bartering and trading allowed producers in some senses to create larger markets in a more favorable way.

I'll absolutely trade maple syrup for a few crates for apple drops or things to whatever someone else has access of that I don't. I would, I love trading. MS19, first-generation

I call her my Italian girlfriend down to one of the markets. She makes Italian cookies and she gives me cookies, so I give her syrup. MS3, multigenerational

...we do a lot of trading with other farmers for food. This year we traded for a big tank. Trade for display boxes, you know anyone, we try to use local people, to help supply us with things and if they like maple and if they're an independent business owner they usually offer, and then well take them up. MS2, first-generation

Cultural Capital

After social capital, cultural capital was expressed most frequently by producers. Multigenerational producers were about 20% more concerned with cultural capital than first-generation producers. This category included how producers valued their history as a maple producer, how they valued either their newness or their experience, and how and if the history and tradition associated with maple sugaring was important to them. This
capital was coded slightly differently than the others, as the two groups of respondents
were asked different questions based on their first-generation or multigenerational status,
meaning that the codes first-generation and multigenerational were really only applied to
those who fit in each category. Due to the self-identifying nature of these categorizations
some producers did express traits from the alternate group.

First-Generation

For first generation producers they felt that even though they did not perhaps have
the same family experience with maple sugaring to call upon that multigenerational
producers might have, that their own specific cultural capitals brought them advantages.
It was a common refrain amongst first-generation producers that they were able to ‘think
outside the box’ and innovate ideas that multigenerational producers might not think of
because they were influenced by their family and history. They felt that their newness
allowed them to make progressive choices and stay ahead of the technological curve.

...when you're brand new you don't come in with any preconceived ideas on what, how it needs to be done. MS19, first-generation

...as far as being beneficial I'm very open to a lot of the newer technologies... And these older guys who've been doing this for 3 - 4 generations, like 'no, no, no but this has been working for a hundred years'. You're right it has, but this is a little more efficient. MS9, first-generation

For some they specifically felt that it was beneficial to not have family that
insisted they do it a certain way.

But not having, you know my grandfather say you have to do it this way, has allowed me to kind of think outside, differently than how it would have been done historically. MS19, first-generation
However, many first-generation producers also felt the lack of experience and knowledge they had compared to their multigenerational counterparts. Many felt that the lack of a person that they could easily go to with questions kept them from figuring out problems as quickly, and that problem-solving was a much harder process for them. Having a mentor or someone else to show them the ropes was something they wished they had had. They were able to look back and apply the knowledge they had learned to when they first began sugaring and understood that issues that had taken considerable time to solve would have taken very little time if they had that knowledge passed down to them or that person they could have asked. This cultural capital can be transformed into human capital in the form of specific skills. Producers lamented that they had to figure it out all on their own.

*I will say that it's a slow learning curve, there are things that I think I should have been on to earlier and I wasn't, I think it makes a difference, you know having a mentor.* MS13, first-generation

*... you don't just grow up doing it and say this is what I'm doing and then add your own innovation to it, it's like we have to figure it all out at once.* MS2, first-generation

**Multigenerational**

Multigenerational producers were more concerned with cultural capital than first-generation. Multigenerational producers expressed cultural capital as knowledge and recipes that they gained from family members, specific help that they gained from their parents who sugared, and stories of their family’s sugaring operation. One multigenerational producer utilized this story as a marketing tool to help make his operation more appealing to customers.
With marketing it helps a lot, when I tell a family story. It's, we have it on our website a little bit and I have my kids helping because people want to buy from me. MS6, multigenerational

It is family so, basically my great pepe on my dad's side. They came from Canada. French Canadian. So. The story was that he strapped the evaporator to the top of the car roof. When they moved to here basically, you know he worked in the mill and stuff. So that was kind of how that started. MS17, multigenerational

Several multigenerational producers still relied on their family to help them sugar, turning their cultural capital into human capital, either through direct usage of their parent’s labor, or through the knowledge that their parent still provided.

Yeah, I know I bounce a lot of questions off my dad and stuff, or my uncles. They have done maple syrup a lot... I would say my dad is the biggest one that I bounce ideas off of. I mean he's, he loves maple syrup and making syrup and everything. MS17, multigenerational

Other than that, we, it's all pretty much right in house because Dad has done everything for years. So yeah that's usually my go to guy. MS3, multigenerational.

In one case the producer’s cultural capital was the recipes for maple candies, and other goods that their grandmother had passed on to them. The specific skills they learned from their grandmother allowed them to set their operation apart. They credited these recipes with helping them keep their regular customers and was subsequently very protective of them.

That was my grandmother's recipe. Yeah and I'm not letting anybody know what it is. MS21, multigenerational

In many cases multigenerational producers were appreciative of the skills and knowledge their parents had passed onto them, but they didn’t feel that all of it was very helpful anymore in light of the new technologies used in sugaring. Many producers felt that the size of their operation had also so far surpassed what their parents had done that the knowledge they gained from them wasn’t very applicable anymore.
Well compared to what I grew up around, you know there's just been so many changes just with technology and everything which makes sugaring a lot easier than what they had to go through. MS21, multigenerational

Mine's all almost a commercial operation, while they were doing more the backyard at home, something to do with the family, whereas now it's turned into a business that, we're pouring money into it to get money out of it and doing it on a much larger scale. MS6, multigenerational

Childhood Connection

Both groups of producers were coded for a childhood connection to maple sugaring. Both groups had individuals who had connections to sugaring as a child, however those who self-identified as first-generation did not feel that this experience was serious enough to call themselves first generation. Several multigenerational producers did not have strong familial connections to maple sugaring and had similar childhood experience to several of the first-generation producers, showing how producers valued this childhood experience in different ways.

So, it started when I was a kid, um probably six years old, my parents got some buckets from my great-grandfather, that he had used. We tapped a few trees around the house and then it was more of a weekend social. MS6, multigenerational

Just when I was a kid about 12, 13 my dad had done it years before I was ever around. And just as a hobby, when he was growing up and so there was a bunch of Maples around the farm and across the street. And so, I tapped them. And we went. My dad took me to the local hardware store and got the spiles they called them then they were 10 cents apiece. MS20, first-generation.

Both of these producers had fairly similar amounts of childhood experience and family connection to sugaring but interpreted that in different ways. Other producers had strong memories of sugaring as children, with all multigenerational producers mentioning this, and only certain first-generation. The frequency of this code is too small to have a clear understanding of the difference between first-generation and multigenerational.
Tradition

Cultural capital includes the way that people view the world, but also the legacy and tradition of practices. The aim of this study is not only to see how producers view their own cultural capital, but to also understand how they value the idea of it. The way that maple syrup is steeped in tradition points to a practice heavy in cultural capital. Interest in the tradition of the operation points to a concern with cultural capital as an institution. For several producers the history of maple sugaring was very important to them in the way that they operated their business, in one case a producer relied heavily on the historical nature of sugaring to make his operation more appealing to people, turning cultural capital into financial capital.

...we try to do it old school stuff especially because it gets me people, helps me get people involved. MS19, first-generation

The tradition of doing things in a certain way was also important, with several producers expressing how keeping with traditional methods was important to them.

I think confections are pretty longstanding, done a very specific way. MS9, first-generation

And so, you know he'd be doing it with the way things were done back then. I mean you're in that sugar house for ever. You know. So, I had fond memories of that as a child, you know taking a week off from school, going up sugaring. Stay in the camp, my grandmother would cook and just all of that. MS21, multigenerational

Natural Capital

Natural capital included references to the sugarbush, ecological and environmental concerns, wildlife, and simply being outside. This capital was expressed around 17% more frequently by first-generation producers than by multigenerational producers. For many producers natural capital was not only expressed in regard to their
sugaring operations, but just simply their appreciation for the outdoors and their appreciation of being outside. Several producers enjoyed sugaring because it allowed them to be outside during an otherwise dormant part of the year.

*I love being outside in the mountains in the winter.* MS19, first-generation

*I'm a sportsman, I like to hunt and fish so that this was something to do in March cause nothing else is going on in March.* MS13, first-generation

*Well hey I love being out on it.* MS3, multigenerational

Interest in being outdoors also coincided with concerns about animals. Most were concerned about animals in the sugarbush, some had positive feelings about this, and some had negative feelings. Some producers worried about the impact that maple sugaring equipment had on the animals or were generally happy to see signs of animals in their forest.

*I really wanted to be a part of the bird friendly project. But Vermont has that, and Maine doesn't. And when I like was like can I participate and they're like you can do all this stuff, but we can't give you credit for it. And I was like oh that's fine. I mean I think we manage the forest healthy.* MS2, first-generation

*But that's a lot of tubes that dear and moose have to dodge and go around...* MS13, first-generation

Other producers had more negative feelings about animals being in the sugarbush and focused on the detrimental impacts that animals had on sugaring equipment.

*So, what if it was deer or a moose came through or what but something, something knocked down a bunch of lines...I mean it was I think I replaced over half my lines this spring so I pretty much like redid almost two hundred taps worth of lines, you know repaired the rest of them.* MS17, multigenerational

*...some squirrel got a little excited and decided he wanted to eat the tubing. A deer pulled it down or moose or what have you.* MS3, multigenerational

*...most sugar makers will tell you have to spend time in the woods every day to make sure your lines running, squirrels haven't chewed into them, a tree or a limb has*
come down and just landed on them so that you haven't got gravity or pulled something out. MS20, first-generation

Producers were also concerned with the access to natural capital that would keep them from expanding their operation. These producers leased taps to supply the majority of their sap needs, and the competition that they faced with other developmental entities made acquiring and keeping land difficult. This producer also spoke about how the valuation of the land for house development over sugaring was not the same everywhere, and that in Vermont it would be opposite. In these areas natural capital was both valued for the ways that it could be turned into financial capital, but in different ways.

...round here its, land is hard, because a house lot is worth eighty thousand dollars. And a house lots worth more with a house on it than it is with maple taps. You go up north into northern Vermont, farmland and maple syrup trees are worth more than a house lot. So down here, land, trees are hard to come by. MS6, multigenerational

**Environmental Concerns**

Environmental concerns included how producers expressed the importance of ecological factors and general environmental concern not related to sugaring. This category was used to understand how producers valued the idea of natural capital in its own pure form, outside of what they thought of their own natural capital. In this code producers expressed their concern for the protection of natural spaces, or natural capital remaining natural capital. This code was the most divided between first-generation and multigenerational producers with first-generation expressing environmental concerns almost 50% more than multigenerational producers. Producers were concerned with the environmental impact of sugaring, particularly the technology utilized today.

*I mean the lines and the extractors, I know it doesn't hurt the tree, but the whole idea of twenty thousand lines being pulled by diesel powered extractors...* MS13, first-generation
Many producers made choices based on the environmental impact of it. For many this meant using wood-burning evaporators rather than oil. Several other producers chose to become organic certified as a way to protect their natural spaces. However, for one producer, this certification was also as a means to open new markets, suggesting a transforming of natural capital in the form of an organic certification into financial capital in the form of new markets at a higher price point.

We're in the second stage of getting MOFGA certified. And there's no evaporator, there's nothing standing in our way, as far as I know, from receiving a MOFGA certification which means that next fall I want to open a booth at the common ground fair... MS23, multigenerational

For many producers the sugarbush had inherent value as a natural space to them that wasn’t developed. Being able to spend time in a natural space was very important to them and the opportunity to do so because of sugaring was part of the value they saw in sugaring.

I mean to me is like wonderful to be able to own a piece of land and not have it be developed. And even though it’s more of a working forest. But, um, you don’t start tapping a maple tree until its 40 years old. You can’t just go out and plant a new round of trees and expect to have a business. MS2, first-generation

After, what I do during the winter because you know, you can, I can be out in the middle of the night or I could be in some crawlspace and it’s like why am I doing this. And then that’s over with and I go do that and that’s where I get my sanity back. Out with the birds and deer. So, it’s more, health wise I guess, I get my health back out there. MS3, multigenerational

Multiple producers expressed concerns about the impacts that climate change and global warming would have on their operations, noticing how temperatures had already changed and that the variability of the season had increased. These producers weren’t sure what the future would hold, and in some cases, didn’t feel there was very much they could do about it.
Maple trees are dying...by the coast, as it warms up the maple trees are dying back and moving up. There’s not many sugar maples down here because of climate. You go to northern Maine and Vermont, New Hampshire, there's a ton of them. It makes me nervous a little bit, but there's only so much I can do about it. It's bigger than me, I'm just going to ride it while I can. MS6, multigenerational

Sugarbush

One of the most important aspects of natural capital to sugarmakers was their sugarbush. This code was fairly even between first-generation and multigenerational producers, with multigenerational producers showing slightly more concern than first-generation. This code included references producers made to their trees, how they maintained the health of their sugarbush, and what the sugarbush meant to them. The sugarbush is really both a form of natural and financial capital. The natural capital of the sugarbush can be transformed into financial capital by making syrup without degrading the natural capital of the sugarbush too much. Health of the trees was very important to producers with tap size and amount of taps used playing a big part in this. Several producers utilized the ‘tree-hugger’ method to determine how many taps could be placed in a tree.

The simple way to tell if a tree is big enough to tap is to hug it. You heard that tree hugger thing. You know if you can’t touch your fingers. Okay so that's a big tree. You don't have a tree smaller than that. And you can't put a second tap onto that tree is sixty-seven inches in circumference. MS23, multigenerational

...so, if I can hug the tree and not touch my fingers. I can only put three taps in it, no matter how big it is. MS9, first-generation

Overall health of the sugarbush also included other factors. For one producer the health of the sugarbush was more than simply the tree health, but also included soil health. Sugarbush health also meant creating an environment suitable to the success of sugar maples. For many producers this meant selective thinning and timber harvesting.
...like I've been in the woods so much now that I see the benefit of actually thinning it out. Because even though they took a lot of sugar maples. So now there's more red maples which is, still makes good syrup, I see that it's actually a fairly young stand of maples now. MS17, multigenerational

They cut only what I want them to cut and so that is enabled. When you when you when you cut a forest stand right, a mature stand and it's all full of maples the maple trees then release and they grow faster. MS23, multigenerational

**Human Capital**

Human capital referred to the labor and specific skills involved with producing syrup as well as the health impacts of it. This was the capital most divided between first-generation and multigenerational producers with first-generation producers mentioning it 31% more than multigenerational. Labor was both the actual labor of the sugarmaker and the labor that they might find to help them. Most producers expressed doubt at being able to find help, particularly at their specific price point, pointing to how financial capital can be transferred to human capital if there is enough, but most didn’t have enough.

...so, it would I think it would be difficult to find like real consistent paid help that could be willing to do the kind of work that it takes to do this. For what, you know what a maple syrup producer could pay. MS19, firstgeneration

*If I wanted to put the money into it I'm sure that I could find people. I mean could find, you know obviously be cheaper to just hire a friend and teach him how to do it. But are they gonna be good at it? Who knows?* MS17, multigenerational

Social capital can also be transformed into human capital by leveraging the relationships the sugarmaker had to get cheaper or free help. Most producers relied on the labor of their friends and family, whom they used these relationships with as a means to get their help, however one producer wasn’t able to completely use his family relationships to leverage labor in the case of his sons.

*But luckily when the season starts my nephew that's in college cause he's usually on break. So, he can help me for a week or two tapping and my younger brother helps me*
on the weekends. We, we pretty much do it in-house so I guess, I guess it would, to answer truthfully, I guess it probably would be quite a challenge to actually hire someone. MS3, multigenerational

I've got experience with that and that is I've got a brother, of that same brother who owns a bookstore, comes and helps and I've got two lazy boys. Oh yeah, they're fine sitting down here. But when it comes to all the other stuff, you know mostly collecting the sap, particularly with the buckets in deep snow over snow banks, is hard work and I'm surprised how hard it is and how little I can get my boys to help me. MS13, first-generation

Another important aspect of human capital is the skills necessary to do a job. Maple sugaring requires lots of specific knowledge, and this is even more true of individual operations where equipment may be homemade or requires specific knowledge past that of general sugaring knowledge, to run it. Many producers were concerned about being able to find someone they could trust to help them with their operation, not believing that person would have the skills necessary.

I don't know if I could find someone I could trust for, and to be able to teach them fast enough, everything that they need to know. MS6, multigenerational

...having help has to be trained, and there's very quirky things about some operations. MS9, first-generation

In addition to the specific knowledge necessary, maple sugaring requires significant labor. Many producers expressed concern about being able to find someone to help that would be willing to do such difficult labor.

...picking up the buckets is so labor intensive. And I mean I could still do it now. But it's like one guy lugging two buckets, it's like you just don't get ahead. MS3, multigenerational

You got to have somebody who is almost athletic to climb the trees because tapping is what it takes most of the time... MS20, first-generation

These factors combined to impact the health of the producers in certain situations, which got in the way of their sugaring operations in certain ways.
You worry about, you get to be my age and things happen to you. I'm due for a knee replacement and I had to schedule that around just after the tap season. MS20, first-generation

In the past few years I've had health issues getting around in the snow. Mostly hips knees and ankles, but you know, if somebody was older than me, you could have heart problems with the snow depth that we keep having to fight through. MS3, multigenerational
DISCUSSION

The aim of this thesis was to understand if valuations of, or concerns for, social capital, cultural capital, natural capital, and human capital were present among Maine maple syrup producers. The first research question addressed the presence of social capital among Maine maple syrup producers. The research found that the producers interviewed were all concerned with social capital. Many valued social capital as a way to gain labor, tools, and other goods. Aspects of social capital for these producers included their communities; including local community and maple community. They utilized these communities and the relationships they had with each community to gain assistance in a variety of ways. These findings support existing literature concerned with social capital. Similar to Bourdieu’s (1986) early work on social capital, this research found that social capital was both held within an individual and groups (mainly the Maine Maple Producers Association and Southern Maine Maple Sugarmakers Association). Additionally, it supports his findings that social capital can be used to leverage goods and favors from other individuals, particularly other capitals.

This work is in contrast to Robert Putnam’s (1995) work which determined social capital to be declining in America. This research finds that social capital is still present over 25 years later among a group that has membership in an association, but an association that does not require much from its member. This work can also be used to support Harrison et al.’s (2016) work that social capital is often better understood in a smaller, more place-based context, seeing that this work is tied strongly to Maine. Additionally, this research could possibly be applied to their work on social capital as
adaptive capacity. Maple syrup producers in Maine who face difficulty obtaining labor or necessary goods using financial capital often turn to social capital, suggesting it is part of their adaptive capacity.

An aspect of the social capital research question was the presence of gift reciprocity to support social capital. Many producers practiced gift reciprocity with landowners as a way to access trees to tap. This was a form of balanced reciprocity that they used to maintain relationships with these landowners, using Sahlins’ (1972) definitions of reciprocity. Producers also used gift reciprocity to maintain relations with friends and family who provided them with labor. This usage of gift reciprocity as a means to support social networks is similar to both Malinowski’s (1984 [1922]) and Mauss’ (1945) findings about gifting and reciprocity as integral aspects of the social relationships of tribes. This research joins Flora et al. (2016), Rissing (2016), and Gerbasi (2004) in finding gift reciprocity in modern populations. It additionally supports Rissing and Gerbasi in finding barter as an important aspect of agricultural producers’ livelihoods. It adds to Rissing’s (2016) findings about the usage of barter as a means to obtain goods outside of the agricultural sphere. Rissing (2016) is based in Iowa, this research adds another region in the United States where barter is used among farmers and other agricultural producers.

The next research question was concerned with the presence of cultural capital, natural capital, and human capital among Maine maple syrup producers. Producers were concerned with cultural capital, with each producer expressing concern for it in some way. Cultural capital was coded differently for first-generation producers and multigenerational producers. Many first-generation producers expressed valuation for
their specific cultural capital and its lack of maple sugaring experience as they felt that it allowed them to try new things with their operations. However, all first-generation producers lamented their lack of specific knowledge that can often accompany a cultural capital of maple sugaring. Multigenerational producers seemed to mostly value the knowledge that they gained through the cultural capital of sugaring their parents passed on to them. This supports both Bourdieu’ (1986) and Flora et al.’s (2016) assertions that cultural capital is passed from parents to children, hereditarily through the family line. For some producers this cultural capital was in the story of their family’s sugaring operation and for another it was recipes. Cultural capital was also a concern for producers in the form of children experience sugaring and the inherent tradition of maple sugaring. Most producers were concerned with this, but it is unclear how many actually valued these experiences.

Every producer was concerned with natural capital, and it would seem that every producer valued natural capital in the form of their sugarbush. For some producers this value was mostly about the way that their sugarbush could be converted into financial capital. However, some producers also saw inherent value in being outside in nature. The animal aspect of natural capital was valued by some producers, with sugaring allowing them to interact more, but for many producers was simply a concern for how it might impact their production.

Human capital was a concern for many producers, with most focusing on the labor aspect, and their inability to find hired help. For producers this was usually a combination of lack of financial capital to afford to hire someone, but also their doubt at being able to find someone with the knowledge necessary to successfully sugar. Many
producers utilized friends and family because they did not have to pay them with money. Some producers seemed to value the specific knowledge necessary to sugar, but this was not all.

The last research question was concerned with how the first-generation or multigenerational status of the producer would impact how they perceived and valued alternative capitals. This was a way to see if cultural capital impacted how the producer viewed these capitals. The research found that first-generation producers were more concerned with environmental factors, human capital, labor, and maple community than multigenerational producers. Multigenerational producers were more concerned with cultural capital and local community than first-generation. The other codes were expressed fairly evenly between the two groups. It is difficult to determine if these different groups of producers valued alternative capitals differently, but the data suggests that first-generation producers valued natural capital more highly than multigenerational producers, particularly in relation to concern for animals in the sugarbush.

These findings support that the Maine maple syrup producers are concerned with alternative forms of valuation. This work supports past literature that has focused on alternative meanings related to maple sugaring (Hinrichs, 1998; Lange, 2017). Similarly to Hinrichs this work finds that cultural and social factors are of strong importance to maple syrup producers, this work adds strength to the cultural economy aspect of Hinrichs’s work. While this work adds to the less quantifiable aspect of Hinrich’s work, it can alternately be used to add a more quantifiable aspect to Lange’s (2017) work, as this work is more data centric than Lange’s ethnographic piece. This research adds to the small but growing body of work on the meanings associated with maple sugaring,
particularly with its focus on a different area than either Vermont or Quebec, where most maple related research takes place.

This research combines four different alternative capitals: social, cultural, natural, and human. Most papers seem to focus on these capitals individually or in conjunction with one other capital. This thesis provides a resource for scholars to see how more than two capitals can be combined to understand a specific practice or group of people. These four capitals were found to overlap with each other; in the case of social and human capital this slippage was significant. These capitals can provide a framework for scholars to understand motivations and how these capitals can be perceived differently by different groups of people.

These findings that alternative forms of capital are of concern to and somewhat valued by Maine maple syrup producers provides a resource for stakeholders to understand why people may begin or continue maple syrup production. Financial factors cannot completely explain why people take part in maple sugaring and these alternative capitals may be able to. This thesis begins the process of understanding how these capitals are valued by producers. These findings may also assist stakeholders such as: Cooperative Extension, The Maine Maple Producers Association, or other agricultural or forest agencies within the state, in assisting Maine maple syrup producers.

This thesis was not able to fully delve into the issue of valuation, most of the findings deal with producers’ concern about these alternative forms of capital rather than outright valuation. This study suggests that producers are valuing these alternative capitals at differing levels and in differing ways, however it is unable to definitively understand exactly how producers may be valuing these alternative capitals. There is also
always a concern that the producers interviewed may be outliers in the maple syrup industry and not represent the concerns and values of other producers.

Future research should focus more deeply on understanding what about alternative forms of capital maple syrup producers value and in what ways. Research into alternative forms of capital among maple syrup producers in other states could provide more insight if these are only regional valuations. Additionally, further research into alternative forms of capital among other agricultural sectors can help inform how these findings may be applied to other groups besides maple syrup producers.
CONCLUSION

This work attempted to understand why people may take part in small- and medium-scale agricultural operations. For many enterprises of this size financial returns are not large. Understanding what other valuations may be important to operators at this size can inform why producers continue to take part in this work. Maple syrup production provides an interesting case study through which to attempt to understand this. The intense seasonality of maple syrup production means that at the small- and medium-scale it cannot provide significant income, suggesting that producers have other motivations besides financial for taking part in this practice. Alternative forms of valuation provide a framework to analyze what other factors besides financial motivate these producers. Based on the history of maple sugaring social capital, cultural capital, natural capital, and human capital all have the potential to be valued by producers. This study found that maple syrup producers were concerned with all of these capitals, and that many producers valued social capital in several ways. Valuations of cultural capital, natural capital, and human capital were somewhat less clear, but research suggests many producers valued them in different ways.

This work began as a way to attempt to understand why Maine maple syrup producers are taking part in a practice that may not be providing large economic returns. Through the process of research collection and speaking with producers, the topic became much more complex and nuanced. What were believed to be clear distinctions became more blurred. The distinction between first-generation and multigenerational producers was not as clear-cut as first believed, leading to interesting findings when it
came to cultural capital. This work attempts to understand a complex group of people who have varying motivations for partaking in maple sugaring. This framework can really only scratch the surface of producer’s motivations. The subject of valuation and motivation is not simple, but it is important.
REFERENCES


APPENDICES
APPENDIX A: IRB APPROVAL LETTER

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 400 Corbett Hall

PRINCIPAL INVESTIGATOR: Sara Velardi
CO-INVESTIGATOR: Jessica Leahy
FACULTY SPONSOR:

TITLE OF PROJECT: Finding the Sweet Spot: Scale Challenges and Opportunities for Beekeeping and Maple Syrup Production in Maine: Interviews
START DATE: 7/16/18
PI DEPARTMENT: School of Forest Resources
FUNDING AGENCY (if any): USDA

STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE Postdoctoral Faculty (F,S,G,U)

1. If PI is a student, is this research to be performed:
   - [ ] for an honors thesis/senior thesis/capstone?
   - [ ] for a master's thesis?
   - [ ] for a doctoral dissertation?
   - [ ] for a course project?
   - [ ] other (specify)

2. Does this application modify a previously approved project? N (Y/N). If yes, please give assigned number (if known) of previously approved project:

3. Is an expedited review requested? Y (Y/N).

Submitting the application indicates the principal investigator’s agreement to abide by the responsibilities outlined in Section I.E. of the Policies and Procedures for the Protection of Human Subjects.

Faculty Sponsors are responsible for oversight of research conducted by their students. The Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine’s Policies and Procedures for the Protection of Human Subjects of Research.

REMINDER: if the principal investigator is an undergraduate student, the Faculty Sponsor MUST submit the application to the IRB.

Email this cover page and complete application to UMRIC@maine.edu

FROM IRB USE ONLY Application # 2018-07-02 Review (F/E): E Expedited Category:

ACTION TAKEN:

X [ ] Judged Exempt; category 2 Modifications required? Yes Accepted (date) 7/10/2018
   [ ] Approved as submitted. Date of next review: by Degree of Risk:
   [ ] Approved pending modifications. Date of next review: by Degree of Risk:
   [ ] Modifications accepted (date):
   [ ] Not approved (see attached statement)
   [ ] Judged not research with human subjects

FINAL APPROVAL TO BEGIN 7/10/2018

Date

01/2017
APPENDIX B: IRB APPLICATION

Sara Velardi
IRB Application for Finding the Sweet Spot Scale Challenges and Opportunities for Maple Syrup Production and Beekeeping in Maine: Interviews

Summary of Proposal:
Small farms are currently confronted with numerous challenges in agricultural production. They are forced to compete in markets predominantly focused on quantity and food safety while also attempting to integrate into consumer-driven markets where price and quality are paramount (Narayanan and Gulati 2003). Maine is comprised of predominantly small and medium-sized farms (USDA-ERS 2016) and has seen a 70 percent increase in farmers under 35 since 2002, with agricultural production viewed as a sector maintaining a young population in the state (Beal and Jemison 2011). Since research is limited on the needs of small to medium-sized producers to help them vitalize and sustain the growth of their respective industries, this research project will attempt to fill that gap by focusing on two small to medium-scale agricultural industries within the state of Maine: (1) maple syrup production and (2) beekeeping. Each of these industries present interesting case studies to evaluate the challenges facing small to medium-scale agricultural operations such as scale management decisions, knowledge transfer, succession plans, and collaborative or cooperative potential among producers.

This research project will contribute to the literatures in natural resource management and sociology of agriculture by first analyzing knowledge exchange and network structure among maple syrup producers and beekeepers. Understanding how producers learn information and which they find most valuable, can address informational barriers enabling more effective recruitment strategies for future producers. Knowledge exchange among producers appears to significantly reduce barriers to entry and growth (Collum 2016). A person’s social network can illustrate their information and resource channels to a broad array of actors who exert social influence and shape actions (Knoke et al. 2008; Wasserman and Faust 1994; Sonnino and Marsden 2006; Ortiz-Miranda et al. 2010). Identifying knowledge networks for producers can help inform additional collaborations and cooperatives for the future that producers may not be optimizing on currently. Furthermore, it can help identify which sources of knowledge producers find most valuable to aid the direction of future educational strategies for small to medium-sized operations in the state. Access to peer and expert opinions was found to be valuable for participants in peer learning programs (Kueper et al. 2013). With a large subset of beekeepers and maple syrup producers becoming engaged in the practice later in life, the evaluation of available peer networks for learning can be a valuable factor to assess since peer networks are found to better engage “late adopters” (Rogers 1995; Allred et al. 2011).

This research project also will assess motivations for scale management decisions within each industry utilizing the theory of planned behavior (Ajzen 1991). The literature has noted that due to corporate industrialization and consolidation, rapid technological development and urbanization pressures, the traditional small family farm has declined in overall profitability and competitiveness (Hoppe et al. 2010; MacDonald et al. 2013; Harl...
2000; USDA 2001). Therefore, the literature has suggested that small to midsize farms need to focus on diversifying their production and reorienting economies of scale to “economies of scope” to effectively compete with larger farms (Paul et al. 2004; Marsden et al. 2002). This research project intends to understand how producers are making scale management decisions and which factors inhibit or encourage their decisions. The theory of planned behavior has been used to understand people’s behavior in a natural resource context (Karppinen and Berghall 2015; Karppinen 2005; Corbett 2002; Daigle et al. 2002) and technology adoption and investment behavior for farmers (Borges, et al. 2014; Price and Leviston 2014; Lynne et al. 1995). This theory will guide the following questions: Are producers transitioning from economies of scale to economies of scope? Are there common challenges preventing this transition? Is the availability of a successor affecting expansion or reduction of the operation? Economic, political, social and environmental factors will be explored for analysis. Understanding rationales and motivations for scale management decisions among maple syrup producers and beekeepers in the state can inform and de-risk future scale decisions for producers, increasing the long-term sustainability and vitality of their operations.

Methods

This study will involve face-to-face interviews at a location of the participant’s choosing. Interviews will take about 60-90 minutes and will be recorded with the participant’s permission. Background information will be gathered for each individual including years’ experience in their respective industry and age as well as background business information (size of operation, number of employees, amount of production, years established). Interviewees will be asked to discuss: (1) their perspective on the current scale and intended future changes of their management practices (2) limitations that could be preventing or delaying intended changes, (3) their sources of information, participation and preferences regarding maple syrup extension, outreach and education, (4) their participation or interest in cooperatives with other producers, and (5) if they have thought about or created succession plans (Appendix A).

References:
Borges, et al. 2014;


Personnel:

Sara Velardi, Postdoctoral Research Associate in the School of Forest Resources is the principal investigator conducting this study. She has six years’ experience conducting research with human subjects. Jessica Leahy, Professor in the School of Forest Resources is the co-principal investigator supervising the project and has 15 years’ experience conducting research with human subjects. Melissa Ladenheim, Associate Dean of the Honors College has fifteen years’ experience conducting research with human subjects. Kourtney Collum, Assistant Professor in Food Systems at the College of the Atlantic has eight years’ experience conducting research with human subjects. Julia McGuire, Instructor in the School of Biology and Ecology has eight years’ experience conducting research with human subjects. Skye Siladi, an undergraduate anthropology major has one year experience conducting research with human subjects. Marianna Mead, an undergraduate at College of the Atlantic has one year experience conducting research with human subjects. All personnel have completed the online human subjects training and passed.

Participant recruitment:

There will be two sets of participants for this study: (1) maple syrup producers and (2) beekeepers in Maine. Participants will be at least 18 years old and will be selected purposively from membership association and licensed state producer listservs or recommended by fellow producers and beekeepers, to represent a range in scale of operations (small and medium). A recruitment flyer (Appendix B and C) will be emailed to membership association and licensed state producer listservs. Once their interest in participating is indicated, we will send them a follow-up email confirmation with request for additional information (Appendix D). Additionally, prospective participants will be recruited through an introductory email explaining the significance of the project as well as the basic description of the interview procedure, and request for additional information (Appendix E). If the participant has not responded within one week of the introductory email being sent, a follow-up email will be sent with the same initial email text. If the participant is unreachable by email and has not responded within one week of the second email attempt, a phone call will be attempted with the same initial email script. Once we have received verification of participation and additional information from participants we will send an email to schedule an interview (Appendix F).

We plan to interview a total of 50 individuals with the expectation of 25 from maple syrup production and 25 from beekeeping.

Informed consent: Participating in the interview indicates consent. A consent form will be attached to the email individuals who indicate they will be a participant, instructing them to read the consent for further details on the study sent to (Appendix F).
Confidentiality: Interviews will be digitally recorded and then transcribed with a transcription software program. The last question of the interview will not be recorded with contact information kept in a separate folder to contact for business consultation follow-up. The files and recordings will be kept on a hard drive of a password-protected computer, in addition to be stored in a locked office when not in use. We will use a numbering and lettering system (e.g. interview #1A) to organize the interview data. The interviews will be transcribed verbatim. Only the transcript will be used for analysis with a qualitative software program. Individual names will be replaced with ID numbers and the key connecting interview numbers to transcripts and participant list will be kept as a hardcopy in a locked office. The key, recording, and transcripts will be deleted in July 2023. Only researchers on this research team will have access to interview data. We will not include any information that will make it possible to identify an individual person in any published reports or presentations. We will use codes and/or pseudonyms to represent participants in our reports and presentations.

Risks to Participants: There are minimal risks to participants, such as cost of individual time and inconvenience. Some business information may be considered sensitive to some interviewees. We will assure participants they can skip any question they prefer not to answer and can stop the interview at any time. Any identification information will be excluded from reports or presentations.

Benefits: There will be no direct benefit for participation but intended outcomes include outreach materials for maple syrup producers and beekeepers to help inform their scale management decisions such as a decision tree as well as possible collaborative or cooperative models for producers to emulate. Results from this study may lead to a greater understanding of factors guiding decision-making, knowledge exchange, succession strategies and cooperative and collaborative potential within the maple syrup and beekeeping industries in Maine.

Compensation: There will be no compensation.
APPENDIX C: INTERVIEW GUIDE

Introduction:

Thank you for agreeing to meet with me today. I look forward to hearing about your experiences in maple sugaring in Maine. As we move through our conversation I’ll be asking you a series of questions. I’ll use this device to record our conversation. Just so you know, we are recording this session so we can go back and review the discussion. The audio will not be used for any other purpose than informing our study. We will not be sharing this audio information with anyone. We will transcribe these and use just selected quotes that do not reveal your identity. Our conversation should last between 1-1 1/2 hours.

We are interested in hearing about your experience in the maple industry here in Maine. We are hoping to have a better understanding of how producers make certain decisions related to the scale or scope of their business, how they learn about maple sugaring and their experience in the maple community in Maine.

Do you have any questions before we begin?

Part 1: Introduction

1) Can you start by telling me how you got into maple sugaring?
   Probe: Did you have a mentor? Can you tell me more about this?
   Probe: How did you get involved in the sale of maple syrup?

2) Can you describe your operation to me?
   Probe: What sorts technology do you use (e.g., reverse osmosis, vacuum tubing, etc.)?
   Probe: How do you market and sell your maple syrup?

3) Are you a first-generation maple syrup producer or multigenerational?
   Probe: How long have you or your family been involved in the industry?

4) [Multigenerational producers only] How has your family made and marketed syrup through the years? In what ways are you doing things differently from what your family has traditionally done?

[First-generation producers only] Some folks have family to follow. As a first-generation producer, how have you learned to make and market your syrup? In what ways are you doing things differently from what others have traditionally done?

5) [Multigenerational producers only] In what ways has having a family history in maple syrup production been beneficial to you? In what ways has it not been beneficial?
[First-generation producers only] In what ways has being new to maple syrup production been beneficial to you? In what ways has it not been beneficial?

6) Can you describe how your operation has changed from when you first started to now?

7) In what ways are you satisfied with how your business is currently operating? In what ways are you dissatisfied?

8) If you wanted to hire someone to help during the sugaring season, would you be able to find help?
   Probe: Can you tell me more about that? Labor skills? Cost?

9) Is running this operation your main job?
   Probe: If yes, are you satisfied that this is your main job? Why?
   Probe: If no, would you like it to be your main job? Why?

So I now have some questions about your thoughts and experience with changing the size of your operations meaning an increase or decrease in output of maple syrup or sap.

10) Have you changed the size of your operations within the last 10 years? decision? What went into making this decision?
    Probe: If no, what are some reasons you decided to not change your size?

11) What do you see as advantages or disadvantages with changing your size?

12) What individuals or groups would approve of you changing your size?
    Probe: Who would disapprove of you changing your size?
    Probe: Do you feel that any of these individuals have influence over your business decisions?

13) Sometimes when we are not sure what to do, we look to others to see what they are doing. Are there any individuals or groups who changed their size recently or said they intend to that would influence your decisions concerning the size of your operation?
    Probe: Can you tell me more?

14) Presently, do you feel like you have control over your business decisions?
    Probe: Can you tell me more why you feel that way?

15) What are some factors that would make it easier for you to change your size?
    Probe: Any particular informational resources? Any individuals?

16) What are some factors that make it more difficult for you to change your size?
17) Can you think of any ways to help overcome these difficulties?
   Probe: Are these things non-existent and would have to be created?

18) Do you intend to change your size within the next 5 years?
   Probe: If yes, how are you planning to change your size? How did you come to the decision to change your size?
   Probe: If no, what are some reasons you do not want to change your size?

   Now for my next set of questions I am interested in your thoughts and experience on increasing the scope of your maple syrup operation meaning producing different types of products from maple syrup like maple candy or more agritourism activities focused on maple sugaring.

19) Have you increased or decreased the number of different products or experiences such as agritourism from your production of maple syrup within the last 10 years?
   Probe: If yes, can you me more about this decision? What went into making this decision?
   Probe: If no, what are some reasons you decided to not increase your product diversity within the last 5 years?

20) What do you see as advantages or disadvantages with changing the diversity of products?

21) What individuals or groups would approve of you changing your product diversity?
   Probe: Who would disapprove of you changing your product diversity?
   Probe: Do you feel that any of these individuals have influence over your business decisions?

22) Are there any individuals or groups who changed their product diversity recently or said they intend to that would influence your decisions concerning the product diversity of your operation?
   Probe: Can you tell me more?

23) Presently, do you feel like you have control over your business decisions?
   Probe: Can you tell why you feel this way?

24) What are some factors that would make it easier for you to change your product diversity?
   Probe: Any particular informational resources? Any individuals?

25) What are some factors that make it more difficult for you to change your product diversity?

26) Can you think of any ways to help overcome these difficulties?
   Probe: Are these things non-existent and would have to be created?
27) Do you intend to increase or decrease your product diversity within the next 5 years? 
   Probe: If yes, how are you planning to change your product diversity? How did you come to the decision to change your product diversity in the next 5 years? 
   Probe: If no, what are some reasons you do not want to change your product diversity? 

   So for my next set of questions I am interested in your community of maple syrup producers and how you learn from producers and how you participate in that community. 

28) How has making maple syrup given you access to your local community? 

29) What does it mean to you to be part of the local community? 

30) How has making maple syrup given you access to a community of other maple syrup producers? 
31) What does it mean to you to be a part of this community? 

32) Do you feel that producing maple syrup has allowed you to be a part of a community you may not otherwise have access to? 
   Probe: Can you tell me more about this? 

33) Who do you look to for advice about maple sugaring? 
   Probe: Who do you trust to get information about maple sugaring? Who would you contact if you had a problem? Do you feel you have a base of individuals to turn to if you have questions? 

34) Do you communicate regularly with other producers? 
   Probe: If yes, what do you communicate with other producers about? Do you serve as a mentor to any other producers? How did you become a mentor? Do you still maintain that relationship? How do you find this communication or mentorship valuable or helpful to you and your production? 
   Probe: If no, why do you not communicate regularly with other producers? Would you like to? Can you tell me more? 

35) How do you share the knowledge that you learn with other producers? 

36) Are there any other individuals you talk to about maple sugaring every once in awhile or not as frequently as the others you previously mentioned? 

37) Have you ever used your maple syrup as something to trade or barter with? Will you tell me a few stories about how you used your maple syrup in this way? 

   My last set of questions concerns your sugarbush and relationships you have with other producers as well as landowners.
38) How do you value your sugarbush?
   Probe: [If they only mention financial] Are there other ways besides monetarily that you value your sugarbush?

39) How do environmental or ecological factors impact your production of maple syrup?

40) Do you own all of the land where you tap your trees?
   Probe: Do you have tap or land leases? Would ever you be interested in leasing [more] taps? Why/why not? Are there other ways in which you can access more taps?
   Probe: Are you aware of any partnerships between landowners and maple syrup producers?
    If yes, can you tell me more about it? Do you participate?
    If no, would you be interested in participating in one? Can you tell me more why/why not you would want to participate?

41) Are you a member of any professional producer associations?
   Probe: If yes, can you tell me more about where you are a member and how you are involved?
   Probe: If no, why are you not involved? Would you like to be?

42) Do you participate in any informal meetings with other producers to share information and talk about your experiences in maple syrup production?
   Probe: If yes, can you tell me more about this?
   Probe: If no, are you aware that any exist? Would you be interested in participating? Why or why not?

43) Do you have any relationships with producers where you share labor or resources to help produce maple syrup?
   Probe: If yes, can you describe this relationship? Is it formal or informal? What are some benefits to being in this relationship? What are some challenges?
   Probe: If no, would you be interested in being in this type of relationship with other producers? Why or why not? Are you aware of any that currently exist?

Thank you very much for your time. We now have some concluding demographic questions.

44) How many taps do you currently have?

45) How much maple syrup do you produce annually (in gallons)?

46) When was your operation established?

47) How many years have you been selling maple products?

48) How many years of experience do you have in maple sugaring?
49) What is your role within your current operation (i.e. manager, owner, co-owner)?

50) If producing maple syrup is not your main job, what other jobs do you have?

51) What is your age?

Now I am going to turn the recording off.

52) Would you be interested in receiving additional help in the form of a small business consultant who could help you develop a business plan to consider a change in your operation size or product diversification?

If yes, please indicate a phone number and email address that is best to reach you at for follow-up.
Are you a small- or medium-scale maple syrup producer in Maine?

The University of Maine and College of the Atlantic are seeking interested small-scale (<300 taps) and medium-scale (300-3,000 taps) maple syrup producers involved in the sale of maple syrup to participate in a 60-90 minute interview at a location of your choosing about your experiences in sugaring and challenges you currently face.

These interviews will be used to understand the scale of operations and to enhance the sustainability, viability, and competitiveness of the small- and medium-scale maple producers within the state of Maine. We would greatly appreciate your time, expertise and experience!

If you are interested in participating, please contact research associate, Sara Velardi, by email (sara.velardi@maine.edu) or by phone (203-583-0181).

We hope to conduct interviews between August-October 2018.

Thank you for your time!
Dear [...] ,

Thank you very much for your interest in participating in this research project. Detailed information about the research project is included in the attached Informed Consent document. Participation in the interview indicates consent. Please let me know if you have any questions about the Informed Consent document or would like any parts clarified.

We are hoping to interview a mix of sizes and family history backgrounds in our study. If you would like to still participate, could you please let us know in your email response:

1) How many taps [colonies] you currently have, and
2) If you are a first or multigenerational producer?

I will contact you about setting up an interview within the next couple of days. I am hoping to complete these interviews in August through October.

Once again, thank you very much for your interest in participating in this research project. I look forward to hearing from you!

Sincerely,
Sara
Dear […],

My name is Sara Velardi and I am postdoctoral research associate in the School of Forest Resources at the University of Maine.

I am working on a project with Professor Jessica Leahy called Finding the Sweet Spot about scale challenges and opportunities for small- and medium-scale maple syrup producers and beekeepers in Maine. We received your name and contact information from the [name of association, other producer or state licensed producer list], which lists [stated you were] you as a [honey, maple or beekeeper] in Maine. We are hoping to talk with small- (<300 taps or >30 colonies) and medium-scale (300-3,000 taps or 30-300 colonies) [producers or beekeepers] involved in the sale of [maple syrup, honey] in Maine to understand how they are making scale management decisions and some of the greater challenges they face in the industry.

The goal of our research is to help inform producers’ decisions about the economic, environmental, social and political factors associated with [beekeeping or maple syrup production] to make appropriate scale management decisions to enhance sustainability, viability and competitiveness of your operations. We also hope to gain an understanding of knowledge production and exchange within your social networks to help inform recruitment strategies, potential collaborative or cooperative partnerships and possible mentorship models.

I, along with my colleague, Skye Siladi, an undergraduate student at the University of Maine, are reaching out to you to ask if you’d be willing to be interviewed about your experience working in the [the maple syrup or beekeeping] industry as a small- or medium-scale [producer or beekeeper]? The recorded interview would last around 60-90 minutes and can take place at a location of your choosing. The interview would be completely confidential. Please see the attached Informed Consent document for further details about the study and let me know if you have any questions or would like any parts clarified.

We are hoping to complete interviews from August through October. If you would like to participate in the project, please let me know. Could you also let me know in your email response how many taps [colonies] you currently have and if you are a first generation or multigenerational producer? We are hoping to get a mix of sizes and backgrounds in family history in our interview sample. Following your response, I will contact you about setting up an interview.

Thank you very much for your time!

Sincerely,
Sara Velardi, Ph.D.
Postdoctoral Research Associate
249 Nutting Hall
School of Forest Resources
University of Maine
Orono, ME 04469
sara.velardi@maine.edu
203-583-0181
Dear […],

Thank you again for your interest in participating in this research project. We would like to set up an interview with you. We are hoping to conduct interviews between August and October. Could you please send me some times, dates and a suggested location to schedule an interview? We anticipate the interview taking about 60-90 minutes.

Once again, thank you very much for your willingness to participate in this research project. I look forward to talking with you!

Sincerely,
Sara
APPENDIX H: INFORMED CONSENT FORM

You are invited to participate in a research project being conducted by Dr. Sara Velardi, postdoctoral research associate, and Dr. Jessica Leahy, professor, in the School of Forest Resources at the University of Maine. The purpose of the research is to understand scale challenges and opportunities for maple syrup producers and beekeepers to inform scale management decisions to enhance the sustainability and viability of the industries within the state of Maine.

What Will You Be Asked to Do?

If you decide to participate, you will be asked to participate in an in-depth recorded interview. It may take approximately 60-90 minutes to participate. You will be asked questions about your operation, rationales for your scale management decisions, knowledge networks and interest in cooperative or collaborative participation. Examples of questions include:
- What does your operation look like? What sorts of materials, technologies do you use?
- Have you expanded your operation (in terms of increasing size or scope) within the last 10-15 years? Why/why not?
- Are there any resources that have been facilitative in helping you increase the scale or scope of your operation?
- What are some of the biggest obstacles you face in terms increasing your size or scope?
- Where do you get the majority of your information from when you have questions about maple sugaring [beekeeping]?

Risks

The risks to you include time and inconvenience.

Benefits

There will be no benefits to you.

Confidentiality

Your identity will be kept confidential. In any published report, we will not include any information that will make it possible to identify an individual person. Individual names will be replaced with ID numbers and the key connecting interview numbers to transcripts and participant list will be kept as a hardcopy in a locked office. The transcripts and recordings will be kept on a hard drive on a password-protected computer. A transcription software will transcribe the interviews. The key, recordings and transcripts will be destroyed in July 2023; only researchers will have access to the records.

Voluntary

Participation is voluntary. If you choose to take part in this study, you may stop at any time without penalty. You may skip any questions you do not wish to answer.

Contact Information
If you have any questions about this study, please contact Sara Velardi at (203)-583-0181, or through email sara.velardi@maine.edu, or mail to 249 Nutting Hall, University of Maine, Orono, ME 04469. You may also reach Dr. Jessica Leahy at (207)-581-2834 or through email jessica.leahy@maine.edu. If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine, (207) 581-1498 or (207) 581-2657 or email umric@maine.edu
AUTHOR BIOGRAPHY

Skye Siladi was born in Northport, Maine on December 6, 1996. She was raised in Montville, Maine and was homeschooled until middle school. She graduated from Mount View High School in 2014. Skye is majoring in Anthropology with a minor in Sustainable Food Systems. Skye studied abroad in Germany with USAC during the spring of her junior year. She was a student research assistant on the Sweet Spot Project. She spent time working on the Real Food Challenge and is a member of Delta Phi Alpha and the Anthropology Club.

After graduation Skye will spend the summer working at The Lost Kitchen in Freedom, Maine.