

A Study of Cooperative Ventures Addressing the Needs of Forest Landowners in Southern Appalachia

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Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Master of Science

In

Forestry

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July 12, 2006
Blacksburg, Virginia

Keywords: Cooperatives, Non-Industrial Private Forest Owners, Decentralization

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(ABSTRACT)

Globalization, specialization, decentralization, and urbanization are changing social, economic, and ecological conditions for forest landowners throughout the United States. One possible response to these new and recurring challenges is economic cooperatives, an old idea being retooled and reapplied, keeping more of the power, control, and profit generated by natural resource extraction and management in the hands of private forest landowners and local communities.

Detailed case studies were carried out on four cooperatives in the Southern Appalachian region. The objectives for this study were: 1) to develop a set of potential criteria/attributes/dimensions/benefits by which these cooperative ventures can be evaluated, 2) to document and understand what mechanisms, institutions, and people will contribute to the success of these cooperatives, 3) to document and understand what obstacles stand in the way of these cooperatives, and 4) to illustrate these findings using four case studies and summarize results in key challenges and keys to success. The four main criteria developed to assess the success or potential success of landowner and business cooperatives were economic feasibility, social feasibility, community enhancement, and ecological sustainability.

The results of this study show that cooperative forestry endeavors such as those studied here are reaching out to forest owners missed by traditional service providers and outreach programs. They emphasize a different set of services coming from a different set of trusted sources and can build community capacity, improve ecological qualities, and enhance local economies; however, professional forestry, state and federal governments are only marginally involved with cooperative ventures. Additionally, nine key challenges that forestry cooperatives need to overcome were identified, and twelve keys to success defined.

Acknowledgements

This study would not have been possible or successful without the help of many dedicated individuals. I would first like to thank my committee, especially Dr. Bruce Hull for his invaluable guidance, insight, and patience--I could not have asked for a better mentor—and Dr. Rien Visser for his support from the very beginning and the opportunity to broaden my perspective with international research experience. I would also like to thank Dr. Jay Sullivan and Dr. Dixie Watts Reaves for their continuous advice and support.

This study was successful also because of the time and hard work of many dedicated cooperative forestry organizers. I would especially like to thank Mr. Paul Catanzaro, an extension specialist with the University of Massachusetts. Finally, I would like to thank my family and friends, especially Ms. Sarah Katherine Small, for their love, words of encouragement, and unwavering support.

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Chapter One: Introduction

Changing Forest Economy

Globalization, specialization, decentralization, and urbanization are changing social, economic, and ecological conditions throughout the United States. Globalization promises to increase per capita incomes and decrease prices for consumer goods, resulting in greater purchasing power and economic well-being (Friedman, 2005; Curtis, 2003). It also levels the playing field in the competition for capital in all business endeavors, the forest sector included. As a result, the forest industry has more freedom to look globally for opportunities that provide the highest return for shareholders (Franklin & Johnson, 2004). Plantations in the Southern Hemisphere, primarily New Zealand, Australia, Chile, and subtropical regions of southeastern Brazil, with climates that support very high levels of wood fiber production on very short rotations, combined with lower labor and other social costs, are both more productive and less expensive than North American forestlands and plantations (Franklin & Johnson, 2004).

In response to these opportunities and pressures, forest industry has engaged in large-scale divestment of North American forestlands and accompanying infrastructure as it reinvests elsewhere. Weyerhaeuser Company, for example, has relocated its land holdings for these reasons. In 2002 and 2003, the company sold 250,000 acres of forestland in the Pacific Northwest, 174,000 acres of forestland in Tennessee, and 170,000 acres of forestland in North and South Carolina while at the same time planning a \$1 billion dollar investment in 321,000 acres of timber plantations in Uruguay (Franklin & Johnson, 2004). The ability to more cheaply grow, process, and distribute forest products from other countries leads to a loss of forest economy in the United States in market segments involved with the production, harvesting, processing, and transport of raw forest products.

Another factor contributing to a change in forest economy in the United States is the changing objectives of landowners. Traditionally, landowners residing in rural areas emphasized consumption and extraction (Jensen & Visser, 2004; Drake, 2001). Today, trees are increasingly valued for less consumptive reasons. They are a source of scenic

beauty, health, and privacy. They also attract wildlife and add to the residential value of land. Studies have shown a demographic shift in rural areas and what are now interface areas, from a majority of landowners holding a more utilitarian minded land ethic to a majority of landowners holding a more conservation-preservation minded land ethic (Jensen & Visser, 2004; Butler & Leatherberry, 2004; Kendra & Hull, 2005; Birch et al., 1998).

Finally, and discussed in more detail in the next section, fragmented, parcelized landscapes change the forest economy by making timber harvesting less profitable (Sampson & Decoster, 2000; Jensen & Visser, 2004). Some estimates suggest that urbanization reduces commercial inventories between 30 and 49 percent (Wear et al., 1999); other estimates are less pessimistic (Barlow et al., 1998). Small individual tract sizes as well as small non-contiguous patches of forestland lead to diseconomies of scale, not only in the harvesting operation but also in management, planning, and marketing of products. This occurs because small tracts frequently yield smaller volumes and are often unable to offset the high costs associated with transportation, capital investment, and operating expenses (Shaffer, 1992).

Changing Forest Ownership

The trend towards the loss of productive forest land in the US is primarily a result of urbanization but is also a result of globalization and timber companies divesting their numerous and very large tracts of land. Best (2002) describes divestment of land by the forest industry as one of the leading causes of permanent forest loss, fragmentation and parcelization. According to data collected from the USDA Natural Resources Conservation Service's 1997 Natural Resource Inventory, between 1982 and 1997, 10 million acres of private forests were lost permanently to development (Best, 2002). This conversion trend is happening at a faster rate than ever before. During the last five years of the inventory period (1992-1997), 70% more forests were permanently lost to development than in the entire previous decade (1982-1991) (Best, 2002). Throughout the 1990s, over 20 million acres of forestland owned by the forest industry was sold with the new owners further selling the land off to residential developers or recreational buyers (Best, 2002).

Permanent forest loss is compounded by national trends in fragmentation and parcelization. Throughout recent years, the number of forest landowners has steadily increased while the average parcel size has steadily decreased (Sampson & Decoster, 2000; Mehmood & Zhang, 2002). From 1978 to 1994, approximately two million acres of forestland per year were broken up into parcels smaller than 100 acres (Birch, 1997; Best, 2002). It has even been hypothesized that if present trends continue, by 2010, approximately 95% of private forest lands will be held in ownership tracts of less than 100 acres (Decoster, 1998). This trend is commonly known as parcelization and is more formally defined as the division of forest tracts into increasingly smaller, individually owned parcels (Best, 2002). Parcelization is primarily caused by timberland divestment, death (intergenerational land transfer), and urbanization or by landowner issues such as income, regulatory uncertainty, and the lack of available financial assistance (Best, 2002; Mehmood & Zhang, 2002). The occurrence of parcelization is supported by numerous studies, perhaps most recently by the National Woodland Owner Survey (NWOS), a new social research tool instituted by the USDA Forest Service to collect annual data on the nation's private forestlands (Butler & Leatherberry, 2004; Egan & Luloff, 2000; Birch et al., 1998; Birch, 1997).

The 2003 National Woodland Owner Survey concludes that the number of family forest owners increased by 11% between 1993 and 2003, and most of this increase was in landownership of between one and fifty acres (Butler & Leatherberry, 2004). In addition, the number of family forest owners over the age of sixty-five increased by 34% between 1993 and 2003 (Butler & Leatherberry, 2004). Increasing age combined with the fact that landowners in the South cited "passing on land to heirs" as their number one reason for owning land suggests that land transfer, more parcelization, and perhaps at an even greater rate will continue to occur in the coming years (Butler & Leatherberry, 2004). Best (2002) reports that in the next decade approximately 54 million acres will begin the process of intergenerational land transfer. Forest fragmentation, on the other hand, occurs when large, contiguous tracts of forestland are broken up into smaller areas of non-contiguous forestland, often referred to as "patches" (Best, 2002).

Changing Forest Ecology

Fragmentation of forestland gathers speed in rapidly urbanizing areas due to the need for infrastructure and subsequent construction of buildings, roads, parking lots, and utility corridors. Fragmentation caused by human influences, which is often more permanent than fragmentation caused by natural disturbances, has been labeled one of the greatest threats to biodiversity worldwide (Zipperer, 2002; Best, 2002; Chapin et al., 2000). Parcelization, fragmentation, and permanent forest loss break up wildlife corridors, forcing species that depend on large ranges and interior forestland and that have poor dispersal abilities to move elsewhere. Neo-tropical migratory birds as well as large mammals are particularly affected by fragmented forest landscapes. It also creates an abundance of “edge” habitat. Edge habitat is often particularly susceptible to colonization by non-native, invasive species, and in many cases, encourages more opportunistic, nuisance species such as white tail deer (*Odocoileus virginianus*). Finally, fragmentation, parcelization, and permanent forest loss isolate existing populations and modify microclimates (Zipperer, 2002).

Another threat to ecological capacity is a trend towards the specialization of ecosystems (e.g. single species, wood fiber plantations). Specialization reduces the diversity of wildlife and plant species in a particular region. As labor, products, technology, and services become increasingly specialized, the demand on the ecosystems providing the raw materials increasingly becomes specialized, and thus the ecosystems themselves become specialized (Zipperer, 2002; Chapin et al., 2000). Industries, in an effort to compete, must find fewer and fewer things they can be exceptional and competitive at and then exploit these qualities. As ecosystems become increasingly specialized (e.g. diverse forestlands are clearcut and replanted as plantations), they become less diverse. As ecosystems lose their diversity, they lose their integrity, health, and capacity.

Changing Community Capacity and Cultural & Regional Identity

Changing forests and a changing forest economy lead to changes in community capacity, a community’s ability to define and solve problems as well as exchange resources, and cultural and regional identity (Flora, 1995). Community capacity changes

because there is a shift in the balance between a community's financial, manufactured, environmental, social and human capital (Flora, 1995). Before discussing the effects of this imbalance, it is first important to understand the various types of capital and how they are related. A community's financial capital can be public or private and consists of money or instruments of credit for investment and speculation (i.e., stocks, bonds, mutual funds, mortgages, futures, etc.). A community's manufactured capital is derived from both public and private financial capital and consists largely of the community's physical infrastructure (i.e., schools, roads, sewage systems, water systems, homes, machinery, and office buildings). Human capital makes financial and manufactured capital more efficient; it consists of the skills, abilities, education and training workers bring to their jobs, along with individual capacity, training, health, values, and leadership. A community's social capital is the collective norms, networks, and mutual trust that contribute to cooperative work for mutual benefit. All other capitals influence social capital. Finally, environmental capital is a community's air quality, water quality and availability, soil quality and availability, biodiversity of flora and fauna, aesthetics, and other landscape amenities. Environmental capital is also linked to all other capitals.

Environmental capital, often compromised by the effects of urbanization, globalization, and specialization (i.e., loss of biodiversity, introduction of invasive exotics, decreasing ecosystem services, and loss of natural landscapes and viewsheds) provides a good illustration of what occurs when there is an imbalance between the capitals. Because the environmental capital found in landscapes is a vital part of a community of place, a landscape compromised by urbanization (manufactured capital) can become unattractive to temporary residents (i.e., tourists) as well as permanent residents (current and potential), thus contributing to a decrease in capitals or a change in the balance of capitals (Flora, 1995). Human capital can be affected by globalization if it results in a loss in forest sector jobs reducing community tax base and making the community less attractive for residents seeking forest-sector employment.

Cultural and regional identities also tend to be affected by changing forests and forest industry. A community's networks, collective norms, and shared mutual aid are its social capital (Flora, 1995; Lee et al., 1990). Communities solve problems and improve quality of life using this capital: the whole of the community is greater than the sum of

the individual members. A loss of traditional residents and an influx of new residents that occurs with forest fragmentation impact this capital. New residents are often wealthier, better educated, and more politically astute and can be crucial in mobilizing community action or increasing local capacity (Kusel, 2001). They may bring resources such as knowledge and money to the local community. They are less concerned about alienating the local institutions on which many long-time residents depend for livelihood. They tend to have more resources and be less dependent upon local means of production, freeing them to be more critical of the local situation. Also, new residents often insist on more formal decision making processes. Long-time resident may feel disenfranchised and threatened by these changes, although those who did not share in the previous power-structure may support the new methods and directions of community governance (Smith & Krannich, 2000).

Cooperation as Response to these Challenges

In response to the trends reviewed above, people, at all levels of supply chain, are looking for alternative management solutions which sustain viable forests and forest dependent communities. People, throughout the United States, are seeking a new relationship with the natural resources on which they depend so heavily, a relationship that emphasizes the health of ecosystems while at the same time the health of communities (Baker & Kusel, 2003). A study conducted by Sample (1994) suggests that voluntary, cross-boundary cooperation, as opposed to regulatory, top-down regulation, is not only the best hope for achieving ecosystem management goals but is also most likely to succeed, especially in areas which have mixed ownership. Furthermore, a study conducted in Virginia found that landowners were not only open to the idea of management across boundaries but were more likely to engage in it if policies were created and funded that provide the needed resources for this type of management to succeed (Hull et al., 2000). Formal business cooperatives, certification, and public-private partnerships are increasingly popular alternative management solutions that exemplify this fundamental and evolving relationship.

Supply chain cooperation, for the purposes of this study, is defined as coordinated efforts among participants in the chain of custody of natural resources such as timber

with the purpose of moving value and control down the supply chain, closer to the landowner and keeping it within the local community. Several recent studies suggest that cooperation in the United States designed around a cooperative model and green certification can be an effective means to sustain economic, social, and environmental capital (Tiles et al., 2004; Sturgess et al., 2004; Kittredge, 2003; Groot, 2002; Foster, 2002; Sample, 1994). Cooperation can provide economic, social, and environmental benefits. Economic benefits include: increased economies of scale, access to new or larger markets, and local circulation of money. Social benefits include: shared knowledge and trust as well as increased community identity and capacity. Environmental benefits include: an increase in quality and quantity of environmental capital, a means to manage ecosystem services, and ecosystem/cross boundary management in a fragmenting forest with shifting ownership demographics and shrinking parcel sizes. Formalized cooperative groups allow people to better represent themselves, their needs as well as their interests (Edmunds & Wollenberg, 2003).

Problem Statement

Globalization, urbanization, specialization, and decentralization are worldwide phenomena changing forests and forestry in ways that impart economic, social, as well as ecological conditions. This is especially the case in areas like Southern Appalachia that have been subjected to economic exploitation, environmental degradation, and cultural oppression by external economic and political forces. One possible response to these new and recurring challenges is to keep more of the power, control, and profit generated by natural resource extraction and management in the hands of landowners and local communities. People with connections to the land and commitment to community will act responsibly towards sustaining the long term ecological, social, and economic capacity of the land and the community, as suggested by the theory of Bioregionalism (Sale, 1985; Thayer, 2003; Curtis, 2003).

Economic cooperatives are an old idea that is being retooled and reapplied in efforts to address these hopes and concerns. In the broadest sense, cooperatives require cooperation among participants in the chain of custody of natural resources such as timber. The chain begins with the landowner and includes professional consultants,

harvesters, transporters, processors, reproducers, marketers, wholesalers, retailers, and end customers. The purpose of this cooperation is to move value and control down the supply chain, closer to the landowner and within the local community. Defined this broadly, cooperatives can include such things as landowners pooling their resources to secure better prices for goods sold and services delivered, local processing of raw resources to add value before export, and a more direct connection between resource producers and retail consumers.

The purpose of this research is to look deeper into the subject of forest landowner cooperation in Southern Appalachia and to hopefully provide an accurate representation of the “what”, “why”, “how” and potential associated with such phenomena. More specifically, the purpose of this particular exploratory study is to examine whether cooperation along the supply chain has the potential to improve and sustain the ecological, economic, and social dimensions of select Southwestern Virginia communities.

The specific objectives of this study are to

- 1) develop a set of potential criteria/attributes/dimensions/benefits by which these cooperative ventures can be evaluated.

Previous studies on this subject, for the most part, have focused primarily on the economic feasibility of such efforts and used this as the primary, if not only, criteria by which to judge their success (Duerr, 1939; Dempsey, 1968; Tiles et al., 2004). Cooperative ventures, however, have the opportunity to make other positive contributions to the challenges of sustaining ecologically functioning forests and the communities that depend on them, challenges that arise from the changing context of forestry and forest land ownership reviewed in the introduction (i.e., globalization, urbanization, aggregation of forest industry, niche markets, new products, and devolution of regulatory authority from federal to state to local and market based solutions). Thus there are other criteria by which to judge their success. Criteria development will provide a better understanding of the contributions forest cooperatives can make to forestry, forest-based communities, and society at large and whether or not they are in fact making these contributions.

2) document and understand what mechanisms, institutions, and people will contribute to the success of these cooperatives,

3) document and understand what obstacles stand in the way of these cooperatives,

Because prior studies on this subject have focused primarily on economic feasibility, detailed explanations as to what mechanisms, institutions, and people contribute to the success or stand in the way of forest cooperatives have largely been ignored or simply not reported. By documenting and understanding what mechanisms, institutions, and people will contribute to the success of cooperatives and what mechanisms, institutions, and people stand in the way of cooperatives, an assessment of the key factors affecting the feasibility of forest cooperative ventures can be made.

4) illustrate these findings using four case studies and summarize results into key challenges and keys to success.

The purpose of illustrating with case studies and summarizing the results into key challenges and keys to success is to make the study and its findings valuable not only to the academic world but also practical for everyday people and fledgling cooperative ventures that are looking for guidance.

Chapter Two: Literature Review

Cooperation

Cooperation, in various forms, has existed throughout the world for many years. It was not, however, until 1844 in Rochdale, England that a true “cooperative” business functioning in a capitalist system, the Rochdale Society of Equitable Pioneers, met with such significant success. In short, the Rochdale Pioneers, a group of weavers on the verge of losing their livelihood due to the advancing Industrial Revolution, came together to better their desperate situation (Birchall, 1994). Their response, along with others seeking the aid of cooperation and its potential benefits, was largely a reaction to the arrival of more open economies and increased volatility in labor markets (Birchall, 1994). Their original operating principles, the Rochdale Principles, are still used as a basis for many cooperatives today (Birchall, 1994; Duerr, 1939). Original principles included: (1) open voluntary membership, (2) democratic control, (3) limited return on equity capital, (4) net surplus belongs to user-owners, (5) cash trading only, (6) political and religious neutrality, and (7) education. Additional, more modern principles include “honest business practices” and “cooperation among cooperatives” (Birchall, 1994).

Distinctions between Types of Cooperation

Business cooperatives are most common in the agricultural sector, but they also exist elsewhere. Insurance companies, credit unions, hardware stores, food co-ops, as well as various utility and recreation companies are all examples of cooperatives. In fact, one in three Americans belongs to one or more of 47,000 cooperatives (Reaves, 2005). While the word “cooperative” suggests the cooperation in the form of a business, in its simplest form, cooperation can be defined as a group of people working together to hopefully receive some degree of increased benefits, whether economic, social, ecological, or educational. Cooperation can be classified in a number of different ways and often holds simultaneous classifications. Some common ways in which cooperation has been classified are by legal status, areas served, groups served, functions performed, and financial structure (Shook et al., 2001). As it is common throughout the literature to

distinguish cooperation by structural make-up and groups served and because it is vital for this particular research inquiry, the definitions of the various classes of structural make-up (i.e., informal, non-profit, and incorporated business) and the various classes of groups served (i.e., producer-marketing, consumer, and worker) will be defined and explored.

Informal cooperation is the casual gathering or coming together of persons with similar interests in an effort to share experiences, resources, knowledge, and perhaps most important fellowship. Most often, this type of cooperation occurs in neighborhoods or among neighboring properties, between people facing similar issues and having similar belief systems. An example of informal cooperation might be neighbors with adjacent properties agreeing, over the fence, to use similar bird seed and create similar habitat conditions in an effort to attract a particular neo-tropical migratory bird.

Non-profit cooperation is slightly more formal than “informal” cooperation, but encompasses many of the same traits. Typically, non-profit cooperation is when a group of people facing similar issues and having similar belief systems comes together in the form of a non-profit organization (301(c)) to not only provide resources, knowledge, and shared experiences with each other but also to provide a greater benefit to the community. An example of non-profit cooperation might be a homeowner’s association or a landowner’s association that not only provides services to its members but takes on a greater role by offering tree planting or bird identification and watching workshops to the public.

Finally, cooperation in the form of an incorporated business is the most formal of the three structural make-ups. Business cooperatives have traditionally emerged in market economies where there are market deficiencies, imperfect competition, and/or unmet needs. Also, they have emerged in communities that are somehow threatened by the costs of economic change, allowing individuals to control the rate and course of this change and safeguard what it is they value as a community (Shook et al., 2001). Generally, this form of cooperation is comprised of individuals with common goals and interests, and members join by purchasing a one-time membership, with one membership equaling one vote. Notably, distribution of benefits is, in most cases, not based on how much capital a person has invested; rather it is based on how much he or she uses the

cooperative. The degree to which a member uses the cooperative is also called “patronage”.

In purchasing a membership, a person chooses to bring a portion of his or her individual resources to a collective pool. While the definition of resources is fairly broad and can include anything from knowledge and expertise to marketing opportunities, in most cases, members are required to bring some portion of their resources to the collective pool. A common and driving goal with a business cooperative model is the promotion and practice of a profitable, competitive, and sustainable business. An example of cooperation in the form of a business might be group of organic farmers forming an agricultural cooperative which highlights and markets their organic farming methods so they can sell higher volume and receive better prices.

Cooperation also can be classified according to who the cooperative is serving. Producer-marketing cooperation is a model that benefits the producers of certain products and services. This type of cooperation is often found in the agriculture sector. Typically, farmers own and operate a plant of some sort. They also produce and market different crops, livestock, and livestock products. This cooperation is also found in the forestry and wood products sector. Some examples of successful agricultural, producer-marketing cooperatives include: Diamond Walnut Growers, Land o’ Lakes, and Sun-Maid Growers of California.

Consumer cooperation is probably the most utilized and well known of the cooperative models. Consumer cooperation occurs when the ultimate users of a particular good try to obtain similar quality products and services at lower prices. The premise behind this form of cooperation is economies of large-scale purchase. Perhaps the more well-known and one of the first occurrences of consumer cooperation in the United States was lead by Benjamin Franklin as a way of providing reasonably priced insurance. Today, consumer cooperatives are available for products and services, including: banking, utility, telephone, housing, food, recreational equipment, etc. Some examples of successful consumer cooperatives include: credit unions, Recreational Equipment Incorporated, and Central Virginia Electric Cooperative.

Finally, worker cooperatives are a business or association formed to employ or benefit a number of workers with similar interests and career goals related to the

production of goods and services. This form of cooperation is different from producer-marketing in that it is not relying on economies of scale. Over 300 examples of worker cooperation exist in the United States, today. Some examples of successful workers cooperatives include: Beluga Software, Big Timberworks, and Burley Design Cooperative.

Forest Landowner Cooperation

Farmers in the US have been relatively successful using the cooperative model for three basic functions: marketing of products, purchasing of equipment, feed, and seed, and access to credit. Forest landowners could benefit from the cooperative model by using it for similar functions: marketing of timber and non-timber forest products, purchasing of low-impact harvesting and other equipment, as well as access to credit. Forest landowners can cooperate in many ways, by informally or formally sharing information, equipment, and labor. In addition, they can cooperate by coordinating land management practices across boundaries (e.g., timber harvests, trails, roads, fire), protecting privacy buffers, creating scenic views, creating wildlife corridors for migration and cover, meeting wildlife habitat needs, holding deeds that share access roads, and through business arrangements that coordinate management, sales, and profit (Bliss et al., 1997; Brunson et al., 1996; Hull et al., 2000; Williams & Ellefson, 1997). Formal forest landowner cooperatives in the United States have existed since the beginning of the twentieth century, over a hundred years, but have met with relatively little success. The number of forest landowner cooperatives as well as their popularity peaked during the Great Depression at sixty-eight fully incorporated businesses (Dempsey, 1968). By 1965, forty-five of the sixty-eight had met with demise due to one or more of the following reasons: inadequate capital, insufficient interest or support by members, lack of business, or poor management (Dempsey, 1968). In recent years, there has been somewhat of a revival of forest landowner cooperatives. This trend is largely based in the Northeast and Midwest; however, most recently, cooperatives have formed in Massachusetts, Michigan, Minnesota, Wisconsin, New York, Vermont, Virginia, and the Pacific Northwest (Community Forestry Resource Center, 2005).

Although relatively unsuccessful in the United States, forest landowner cooperation has succeeded elsewhere in the world; Japan, parts of Europe, and especially Scandinavia for many years (Kittredge, 2003). However, these foreign cooperatives, for the most part, have had very different objectives than that of the forest landowner cooperatives formed in the United States. In Japan, Europe, and Scandinavia, forest landowner cooperatives were a way for private landowners, with some dependence on timberland investment, to compete with heavy pressures from forest industry which were largely a result of their governments divesting and thus selling off large tracts of land. Today, these landowners join primarily for full-service forestry and better prices for their timber (Kittredge, 2003). Regions within countries and some countries as a whole even require that private landowners, holding a minimum acreage of land, join cooperatives. Forest landowner cooperatives in the United States seek to address some of the challenges created by globalization, environmental degradation, and urbanization. Cooperatives also engage landowners and create opportunities for social learning and community capacity building.

Research Setting

This study is primarily focused in Southwestern Virginia, home to four emerging cooperative forestry endeavors, and it is located in Southern Appalachia, a region that for many years has been subjected to economic exploitation, environmental degradation, and cultural oppression by external economic and political forces making it susceptible to changing forests and forestry. The Appalachian Regional Commission, a federal-state committee, established in the early 1960s by the Executive and Legislative branches of the United States government, to address persistent poverty and increasing economic despair, defines Appalachia within the boundaries of thirteen individual states. These states include: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. It is a 200,000 square-mile region that extends over 1,000 miles north from New York south to Northern Mississippi. Appalachia is often broken into two distinct sections within the literature, a northern region and a southern region. The southern region has been further broken down into: the Blue Ridge, the Great Valley, and the Ridge and

Valley Province (Drake, 2001). The name, Appalachia, is derived from the Native American tribe, Appalachee, of northern Florida.

The Appalachian region is very diverse topographically and ecologically. It is characterized topographically by gentle, rolling hills in some areas, flat land in others, as well as rugged mountains extending over 6,000 feet high in still other areas. Southern Appalachia is particularly diverse with regards to the numbers and richness of native flora and fauna. The Great Smokey Mountains, in the heart of Southern Appalachia, are home to over 1400 varieties of flowering plants and over 100 varieties of trees, alone. Shenandoah National Park, nestled in the Ridge and Valley Province of the southern region, is home to 300 year old hemlocks and 400 year old white-oaks. Furthermore, the Clinch Valley, located in Southwestern Virginia, is home to forty different species of freshwater mussel of which twenty-nine are rare and endangered. The vast forests and streams of the Southern Appalachian region provide vital habitat for a variety of wildlife, including black bears (*Ursus americanus*), northern flying squirrels (*Glaucomys sabrinus*), brown trout (*Salmo trutta*), and an uncommon variety of salamanders.

During European settlement throughout the eighteenth century, the Appalachian region was widely viewed as bountiful, hearty, and beautiful but also both geographically isolated and wild. Southern Appalachia, primarily, was settled by persons of Irish and Scottish descent and on the ideals of yeomanry. An anthropologist by the name of John S. Otto has characterized yeomanry as a grazing, agriculture based economy where families patch farmed on fairly isolated areas with limited livestock (Drake, 2001). Centers of interest, for these rural communities, were, for the most part, county seats, churches, and schools. Some research suggests that yeomanry was a precursor stage to commercial-type, capitalist agriculture; however, there is evidence to suggest that it, in fact, was not a stage of agriculture's evolution but a different approach to agriculture all together (Drake, 2001). Although geographically separate, to distinguish themselves even further from the slave-owning plantation elite, these settlers called themselves "Cohees" and their region the "New Virginia".

The region, from almost the beginnings of European settlement, has largely been characterized as having a distinct culture which perpetuates a rural, agrarian lifestyle. This culture has been defined as a set of customary beliefs based heavily on self-reliance,

traditionalism, fatalism, and religious fundamentalism (Billings, 1974). A yeomanesque livelihood is not the only distinct facet contributing to this culture. Religion and speech, common to Southern Appalachia, are also distinct. Religion in the Cohee culture was dominated by revivalistic churches such as the Methodists and Baptists. Modern Appalachian life is still based heavily on the old “anti-missionary Baptists” and the camp-revivals common to the nineteenth century (Drake, 2001). The speech, common to the Cohee culture, was rooted in English that was spoken by the Irish and was already old for its time in the eighteenth century. Many of the words and accents from this English, one of the most ancient forms of the language, are still spoken today.

Observers suggests that social class identity, defines this culture, and therefore, promotes poverty and powerlessness (Keefe, 2000). However, other observers argue that the region’s heavy emphasis on resource extraction as fuel for its economy and subsequent and unprecedented exploitation by large resource extraction companies (e.g. coal and timber) as perhaps the more indicative reason for why it has remained so economically depressed, a phenomenon commonly referred to as the “colonization” of the region by outside business interests. This culture is not defined not so much by social class identity as it is by cultural and regional identity (Robertson & Hull, 2003).

Despite many studies throughout the years that have suggested Appalachia culture is a debilitating one, people who live in and have a family history in Appalachia believe otherwise. People clearly conceptualize themselves as a group with a common and important culture and identity (Keefe, 2000). Not only do they believe in the significance and the distinctiveness of their cultural and regional identity, but they are also afraid of losing it as a result of domestic and global changes that have occurred throughout the years and are still occurring today. Loss of identity is not the only consequence of changes occurring in Southern Appalachia. The region is also experiencing a loss in community capacity, ecological integrity, and economic well-being.

Southern Appalachia was one of the United States’ first regions to face the negative consequences that potentially accompany technological advancement and specialization (Drake, 2001). The coal-mining industry benefited the region by bringing jobs and capital to the region. However, coal miners faced arduous and dangerous working conditions. With the signing of the Love-Lewis Agreement in 1950, unions

established to protect mine laborers, agreed that they would not oppose the introduction of any level or method of technology in exchange for higher wages and health benefits to underground mine workers. The result of this agreement was a tremendous loss of jobs and a heavy burden placed on the region's economy. For the industry to offset the higher costs of labor, it had to introduce more technologically advanced, specialized, and efficient mining methods (e.g. stripping, Long Wall, and eventually, mountaintop removal) and tools (e.g. augers). These advances in technology and specialization made the need for a large number of laborers and low-skilled laborers, at that, virtually obsolete, leaving many people jobless.

Another consequence of these advances in resource extraction technology and efficiency has been increased, negative pressures placed on the environment. Stripping and mountaintop removal became possible due to technology (e.g. bulldozers and giant shovels) that was developed during World War II. In both methods, the soil covering the coal, the "overburden" is simply pushed away and the then exposed coal removed by surface methods (Drake, 2001). When the "overburden" is pushed out of the way, down the mountain, it creates an unstable area that may stay unstable for years. These unstable areas are heavily affected by rainfall, clogging streams and destroying, with a mass inundation of mud, farms and forestland downstream from such operations (Drake, 2001).

Global changes have also impacted Southern Appalachia by moving textile, furniture, and other manufacturing jobs which paid decent wages and provided good benefits to other countries where labor costs are significantly less. In addition, global changes have impacted Appalachia by moving the timber industry, timber being a resource still found in relative abundance, to foreign countries that can grow, harvest, and ship wood fiber faster and cheaper. In-migration of Hispanic workers, made easier by globalization, has further impacted Southern Appalachia. Often, these workers are willing to work for lower wages and fewer benefits, thus making them a more attractive employee for the fewer and fewer jobs still remaining in the region.

Although Appalachia has made great progress in overcoming extremely high levels of poverty and extremely low levels of literacy and education, the region continues to face some continuing and many new challenges. The Appalachian Regional

Commission cites four major challenges (Appalachian Regional Commission, 2005). First, the region faces competition from globalization in key industries, such as textiles manufacturing, apparel manufacturing, and forest industry. Second, where manufacturing remains a dominant industry, the income base has been eroded by declining real wages. Third, the region faces a continued economic decline in the coal industry. And finally, seventy-one counties (classified as distressed) still have a high dependence on tobacco production which also is continuing in economic decline.

Chapter Three: Criteria Development

Criteria to Evaluate Cooperatives

For the purpose of this study five criteria were developed to evaluate the success of cooperative ventures. These criteria are based on a thorough review of the literature. This chapter will define, justify, and operationalize these criteria. These criteria are 1) economic feasibility (Is the venture able to recover costs, hopefully provide an additional rate of return, and sustain effective production?), 2) social feasibility (Does the venture have community support, landowner buy in, and professional forestry community buy in?), 3) community enhancing (Is the cooperative venture contributing to a community's capacity, a regional and cultural identity as well as a regional or local economy?), 4) ecological sustainability (Is the cooperative venture helping to maintaining ecosystem functions and services by keeping forests in forests and through sustainable forest management practices?). 5) Other key factors leading to success or failure of cooperative ventures (What mechanisms, projects, people will contribute to the success of these cases? What obstacles stand in the way of these cases happening? What is the likelihood each case will be successful?).

Economic Feasibility

Economically feasible cooperatives will recover costs, hopefully provide an additional rate of return, and sustain effective production in the face of uncertainty and risk. Without the economic resources to continue to address the values and meet the goals of participants, a project or program cannot achieve success. Forest landowner cooperatives, throughout their history, have failed largely due to economic barriers including: inadequate capital, lack of business, or poor business management (Dempsey, 1968). Economic feasibility for forest cooperative ventures is often difficult to assess. These ventures are not often a true private business working within a free market. Often times, they rely, at least at first, on private and public grant money to subsidize their operations. As a result, rather than use a business model to assess economic feasibility, it would be wise to ask questions that determine to what extent have economic feasibility questions been considered by the venture (Nadeau et al., 2005).

Therefore, economic feasibility can be evidenced by access to financial capital. Do these ventures know how much capital is needed to get started and running, do they have access to capital, if so, where is it coming from and does it eventually need to be paid back? This is especially an issue for full-service, vertically integrated business cooperatives; where capital costs include harvesting equipment, processing equipment, insurance, worker training, and running a small business or organization. Many cooperative forestry activities have met with early demise simply because they did not invest enough time and effort in gaining the adequate amount of financial capital needed to support such endeavors (Dempsey, 1968).

Typically, finding small grants is not such a difficult task. Large grants, however, often require a group to meet certain minimum requirements before they can apply (e.g., obtaining legal incorporation status). Noteworthy, the 2002 Farm Bill acknowledged the importance of cooperative and community forestry; however, it failed to pass special funding that would provide support for such cooperative endeavors (Foster, 2002). Cooperative endeavors in the form of an incorporated business have several additional opportunities to access adequate capital. The cooperative can retain a percentage of patronage to finance early operations and build equity, offer a preferred or capital stock option for potential investors, sell delivery rights, or borrow money from private banks in the form of a small business loan. Borrowing money can be difficult for forestry cooperatives because typically private banks require at least 30% to 40% in investor equity to offset the risks associated with a business loan (Anderson, 2003).

In addition to having access to financial capital, economic feasibility can also be evidenced by the presence of a comprehensive and complete feasibility study, a board approved business plan, efforts to reduce the risk associated with increased vertical integration, proven markets for cooperatively produced value-added goods, and the presence of established ecologically sound service providers. Are there ecologically sensitive loggers, foresters trained and approved in third-party certification, and other service providers available, if so are they affordable? The more vertically integrated (i.e., the more services in the forest products supply chain a cooperative integrates into its operations) a cooperative is, the more potential risk. This is the case because the decision to provide a given service is usually based on assumptions about the market and because

the ability to provide more services requires the cooperative to access additional manufactured capital, human capital, and thus financial capital to be able to offer quality services. For example, if a cooperative provides planning, management, low-impact harvesting, initial processing, drying, further processing, and marketing services, the endeavor must have professionals trained in those fields on staff as well as low-impact equipment, processing equipment, storage, office space, marketing specialists, etc. If not well researched and planned, vertical integration can quickly drain what was initially thought to be a well-capitalized endeavor (Anderson, 2003; Rickenbach et al., 2005).

Social Feasibility

A successful cooperative needs the support of landowners, buyers, consumers, professionals, government, and NGOs. These entities must believe in and support the program/project to devote time and resources towards its success. Support is important because it dictates the amount of time, resources, advice, business, legitimacy, and funding contributed to making a program/project successful. This support helps cooperatives overcome the greatest challenges--start-up costs and lack of financial capital.

Landowners understandably worry about losing autonomy over land use decisions and management. Landowners need good, applicable reasons to engage in cooperative management. They need to understand that their management goals can, in many cases, better be achieved through cross-boundary, cooperative management (Dedrick et al., 2000). Landowners willing to engage in forest landowner cooperation and thus cross-boundary management must be flexible and willing to allow others, to some extent, access and influence over their land. They must be willing to forgo some private business opportunities pertaining to their invested forestland for the good of such cooperative efforts.

Cooperation of this type remains somewhat unpopular, especially in the South because of the influence of timber industry, the values held by landowners, lack of knowledge regarding forest management practices, and concern about private property rights (Sample, 1994; Brunson et al., 1996; Williams & Ellefson, 1997). However, a deep commitment to land stewardship may offset a landowner's concerns they may or may not have over private property rights (Brunson et al., 1996).

Another challenge to the success of these ventures is lack of buy-in from the forestry profession. Attitudes held by some forestry professionals towards managing forests and other natural resources as social value create a barrier to forest landowner cooperation and cooperative endeavors. Ed Orcutt, a consulting forester and congressman for the state of Washington authored a very telling essay detailing some foresters' concerns about forest certification. He wrote, "third-party certification is an indication that we think that we have failed as forestry professionals, because we are saying we need someone who has no professional experience in forestry to tell us whether or not we are doing it right" (Wilent, 2005). Landowner and third-party cooperation can be interpreted as challenging the "hearts, intellects, and egos" of traditional forestry professionals because it emphasizes social rather than biological or technical solutions to forest problems (Kennedy & Thomas, 1995).

Buy-in can be evidenced through interviews with local forestry professionals, by interest and membership in a cooperative venture, relationships with other local businesses, existence of markets, and whether or not there is government, professional, and educational support. How many people are involved, to what extent, why are they involved, and is involvement diverse? Do relationships with other local business exist and to what degree? Is there local/regional demand for the services and goods provided by the venture? Do relevant local institutions provide technical, financial, educational assistance, do relevant professionals believe in and support, ideologically, these ventures?

Community Enhancing-Capacity, Economy, Identity

A community's networks, expertise, and shared mutual aid are some of the components of its social capital. A community's capacity is dependent upon its social capital to be able to solve various problems and optimize multiple goals (Flora & Flora, 1993). These qualities are difficult to quantify but can be evidenced through interviews with key informants who can speak to the extent of the network, access to expertise within the community, access to expertise outside the community, and the demonstrated or promised willingness among community members to support the effort; and is evidenced even further by equitable distribution of power, wealth, and opportunity as well as generally improved standards of living among all members of the community (Kusel, 2001).

A thriving local and regional economy requires the production, exchange, and consumption of goods and services locally and regionally. Monetary and material wealth, services, and goods should stay within a community or region. Evidence of the potential for a cooperative venture to promote local economy can be found in access to local financial capital and manufactured capital, local flow of products and services, value and volume of value-added products, trade and distributional equality, efficiency, and number of forest acres that allow timber harvesting (Flora, 1995). Does the venture have access to local capital, if so what is the source? Are the facilities and infrastructure available to support such endeavors? Are there proven local markets for the products and services provided by the cooperative, are there mechanisms (e.g. agreements, marketing schemes, etc) in place to help ensure the local flow of products and services?

Cultural and regional identities are just two of many manifestations of identity held by members of a group and are not mutually exclusive (Hummond, 1992; Rivlin, 1987). Typically, cultural identity suggests that a particular group has a common set of beliefs, values, attitudes, behaviors, and norms which have been formed emphasizing a group-held sense of connectedness among its people. Regional identity suggests these commonalities are shared and a group-held sense of connectedness is held by people inhabiting a particular region. Regional and cultural identities are associated with resident's assessment of quality of life and affect of community's capacity to enlist community members in community-oriented actions (Hummond, 1992; Rivlin, 1987). Whether or not a venture contributes to cultural and regional identity can be evidenced by the extent to which the venture incorporates the importance of place and place-based identity in its overall mission and the extent to which other community entities support/promote the venture. Does the cooperative venture market itself as community enhancing, if so how, what is being enhanced, does it use local/regional product marketing schemes like "Mountains of Hardwoods" or "Homegrown"? Are other community supported groups and locally relevant institutions endorsing the venture, are they providing technical, educational, financial support?

Ecological Sustainability

Ecological sustainability reflects the extent to which ecological processes and biodiversity remain viable. The effect of a cooperative venture will be examined by

trying to document its potential to increase the percent of forestland certified or somehow under forest management that professionals deem supportive of biodiversity and ecosystem services. It can also be evidenced by the availability of ecologically sensitive management, harvesting, and processing service providers. Are these service providers available, will they be used, what about their practices makes them ecologically sensitive, are there mechanisms in place to ensure some degree of accountability (e.g. monitoring programs)?

Certification

Certification, whether third-party or self certification, is one way of improving a community or region's environmental capital. Certification is a non-state, market driven program recognizing companies and landowners who practice sustainable forest management. Emergence and interest in non-state, market driven programs can be traced back to trends in the last ten years where increased salience has been placed on domestic and international, market-oriented policy instruments (Cashore et al., 2003). Domestic policies are facing increased scrutiny by worldwide actors, international rules and norms (Cashore et al., 2003). As a response to this scrutiny, programs like third-party certification have surfaced. Certification, in large part, is viewed as a product of internationalization (Cashore et al., 2003).

One study suggests certification programs are a form of civic society that replicates and expands the kind of regulatory functions that are often performed by governments and extends them to a worldwide level (Meidinger, 2002). Third-party certification of forestlands can provide a more efficient form of regulation than that provided by governments because it deals with a narrower range of issues. Certification can be viewed largely as a natural extension to government regulations as all certification programs make an effort to meet existing government standards such as state mandated Best Management Practices (Meidinger, 2002).

Certification programs, in particular, attempt to ensure that harvesting of timber and non-timber forest products and management of forestland occurs in a way that protects ecological integrity and ensures sustainability of the resources being extracted (i.e., timber, ginseng, mushrooms, etc.) and the resource (i.e., the forest itself) from

which they were extracted. In most cases, this assurance is achieved through product auditing and labeling by a third, independent party. The most visible certification programs, today, are the Forest Stewardship Council (FSC), American Forests and Paper Association's Sustainable Forestry Initiative (SFI), American Tree Farm, and in Europe, the Programme for the Endorsement of Forest Certification schemes (PEFC). It is not only forestlands, their planning, management, and harvesting that are being certified, but also businesses in the supply chain. Businesses involved in the forest products supply chain are certified as users of wood and other forest products that come directly and only from certified lands.

The idea of forest certification and eco-labeling, the labeling of products or services that have been authorized by third-party, unbiased organizations on the basis of meeting recognized criteria, surfaced during the mid to late 1980s both within the forest products industry as well as the conservation movement. For the conservation movement, forest certification was a market driven alternative that could potentially lead to opportunity and success where traditional intergovernmental processes had failed (Washburn and Miller, 2003). Non-governmental organizations in the late 1980s asked the International Tropical Timber Organization (ITTO) to consider and adopt a state-based eco-labeling scheme to certify sustainable tropical forestry and forest products (Gulbrandsen, 2005). The failure of the ITTO and other forest-covered developing countries to adopt certification programs especially during the 1992 United Nations Conference on the Environment and Development in Rio ultimately lead to the creation and establishment of the Forest Stewardship Council (FSC).

In the early 1990s, people became increasingly aware of and interested in the global pressures being placed on cultures and their natural resources throughout the world. In addition, timber retailers and distributors began to face increased scrutiny over deforestation of tropical forestlands. As a result, foresters, loggers, environmentalists, and social scientists, alike, in 1993 came together forming the Forest Stewardship Council, the conservation movement's premier certification program. Their primary interests were to change sustainable forestry and how sustainable forestry is communicated to the public worldwide. Based in Oaxaca, Mexico, the mission of FSC is "to promote environmentally appropriate, socially beneficial, and economically viable

management of the world's forests" (Washburn & Miller, 2003). This mission has been promoted through the organization's establishment and endorsement of ten main principles and accompanying criteria for forest management. These principles are comprehensive, addressing tenure and usage rights, workers' rights, indigenous people's rights, community capacity and well-being, ecosystem maintenance and conservation of forest resources, benefits from the use of forests, forest management planning, monitoring and assessment of sustainable forestry practices, and plantation forestry (Gulbrandsen, 2005). The Forest Stewardship Council is a unique certification program in that it addresses ecological as well as social issues. Currently, FSC has over 140 million acres managed to its standards globally and over 30 million acres in North America (Washburn, 2005). Also, currently, there are approximately 4000 companies in the FSC chain-of-custody system and this number is growing (Washburn, 2005).

The Sustainable Forestry Initiative, on the other hand, can be traced back to the early 1990s as well. It was formally introduced in 1995. SFI is a forest management standard and certification program that developed, largely, as a "voluntary code of conduct" for the members of the American Forest and Paper Association (Wallinger, 2003). It is argued that SFI was the industry's response to the conservation-based FSC; however, there is evidence to suggest that SFI was in the works alongside FSC (Cashore et al., 2003). SFI's basic mission is to improve the industry's understanding of sustainable forestry issues through the creation of sustainable forestry standards, principles, objectives, and third-party review. SFI, like most industry-based forest certification programs (i.e. the Programme for the Endorsement of Certification schemes (PEFC) and the Canadian Standards Association's (CSA) certification program), is considered less comprehensive with a more lenient set of sustainable forest management standards than conservation-based programs like FSC (Gulbrandsen, 2005). FSC places more emphasis on performance standards and includes workers' rights, indigenous people's rights and well-being, and use and tenure rights as part of what they consider a well-managed forest. SFI, along with other industry-based schemes, focuses more on organizational measures and procedural rights (Gulbrandsen, 2005).

Certification not only can be a means of insuring ecological sustainability, it can increase economic sustainability by defining and capturing a niche market. Markets exist

for certified timber and non-timber products (Jensen et al., 2003; Ozanne & Vlosky, 2003; Kozak et al., 2004). In addition, there is support for certification. For example, results from Jensen et al (2003) showed that 42.2 percent, of 811 Pennsylvania residents surveyed, supported certification. Forty-five point five percent supported certification but were unwilling to pay higher prices, and 11.3 percent were unsupportive of certification regardless of costs (Jensen et al., 2003). The most willing to participate in the certified wood market were non-homeowners, female, recyclers, college-educated, and previous purchasers of environmentally labeled non-wood products.

The cited studies above, however, only use attitude measures and contingent valuation as methods for identifying the market and measuring consumer willingness to pay. Anderson and Hansen (2004) used behavioral means to determine whether consumers were really more likely to choose certified than non-certified products and whether or not they were truly willing to pay a premium for certified forest products. There is a preference for certified products when prices between certified and non-certified are equal; however, when the price of certified products are at a slightly higher premium, in this particular study at 2 percent, purchases of certified products drop (Anderson & Hansen, 2004). In spite of these findings, Kozak et al. (2004) found that there is a preference for certified, value-added wood products even though people noted before the study that they didn't know what certification was and were less likely to prefer it. After the study, having been educated on certification, consumers were more likely to seek out certified products. This suggests that education on certification and certified wood products is needed. Some certification programs, like the Forest Stewardship Council, involve the public (i.e., in the form of public hearings) throughout the process.

For the most part, forest certification in the US, whether industry- or conservation-based, has largely occurred on private industry land. Fragmented landscapes resist certain brands of forest certification due to hurdles which include transaction costs and decreased economies of scale (Rickenbach, 2002; Cashore et al., 2003). The cost of initial certification and yearly audits is a major reason for not certifying land (Rickenbach, 2002). Certification has been slow to take hold and thus costs for actual certification remain fairly high. While in the long-run certification

promises to be cost effective, initial certification costs typically are approximately \$0.10 per acre (Global Institute of Sustainable Forestry, 2002). This does not include annual license fees of about \$1000 and random or yearly audits. Other expenses include: site visits, over-site, report preparation, landowner or agency time, effort, and money spent in preparing for certification. Finally market opportunities are a challenge because, in order to have a market for the wood and other non-timber forest products, an effort must be made to convince consumers that a difference in cost (i.e., a premium paid for certified products) is worth the assurance that the forests where the products are originating are being managed sustainably.

More recently, certification has started to take hold on public lands. Pennsylvania has certified all 2.1 million acres of their state land. Other states, North Carolina for example, have certified portions their land (i.e., university and some state land). And still other states are actively involved in the certification process or are looking into the feasibility and usefulness of such an endeavor (Cubbage et al., 2003). The United States Forest Service, in the form of a pilot program, has decided to undergo the certification process, both SFI and FSC, on several of their forests, a portion of the Freemont National Forest in southern Oregon and the Alleghany National Forest in Pennsylvania. The audit will include Mount Hood and Siuslaw in Oregon, Medicine Bow in Wyoming, Chequamegon in Wisconsin and all national forests in Florida. According to a recent statement released by Sally Collins, associate chief of the USDA Forest Service, certification is “becoming an international language and we [the Forest Service] ought to be able to show we manage our forests sustainably” (Barnard, 2005).

Silviculture

Many cooperative forestry endeavors advocate for or practice some type of uneven-aged management, a silvicultural method that ensures at least three age classes remain within a stand at all times (Nyland, 1996). While there is evidence to suggest that uneven-age management is beneficial (i.e., it ensures a continuous forest cover and it is advocated by the Forest Stewardship Council, a successful certification organization), there is also evidence to suggest otherwise. In general it is difficult to find skilled foresters trained in uneven-aged management and skilled loggers willing to harvest in

managed, uneven-aged stands. If the service providers are unavailable for one reason or another, true uneven-aged management is not an option. Typically uneven-aged management requires a significant investment in time and attention to detail on the part of the forester and logger which then translates into cost. Using single-tree selection, for example, a forester ideally needs to start the management regime with information on age, diameter distributions, and the variation in those distributions among species. In addition, each potential leave tree (or future crop tree) within a stand has to be identified before and after a harvest by the forester, and management needs to be carried out for the foreseeable future. Also, when using single-tree selection, it is not uncommon to leave over 50% of the stand's basal area during a harvest. The more trees left in a stand, the more opportunity there is for residual stand damage. For the typical logger who is paid based on the volume, grade, and species he or she provides the mill, not only is the lack of harvestable volume unappealing but so is the attention to detail, time, and thus cost required in order to avoid residual stand damage. Another issue related to the feasibility of uneven-aged management is land tenure. Uneven-aged management often requires decades and even centuries to realize success. As land ownership changes, so do the objectives of the new landowners (Birch, 1997; Butler & Leatherberry, 2004).

The environmental benefits commonly associated with uneven-aged management are also questionable. The frequency of harvests required with uneven-aged management can increase levels of erosion, sedimentation, and soil compaction (Aust & Blinn, 2004; Yoho, 1980; Jackson et al., 2005). Up to 90% of erosion and sedimentation associated with harvesting is due to permanent and temporary roads (Yoho, 1980). Frequent entry into the stand also means the frequent reopening and redisturbance of recovering skid trails. A recent study examining soil loss from the different harvesting regimes associated with various silvicultural systems suggests that the frequent reopening and redisturbance of recovering skid trails associated with uneven-aged silviculture can lead to more soil loss than even-aged management (Hood et al., 2002). Because entry into a stand is more frequent and extraction is more specialized with uneven-aged management, it is often necessary to create a detailed, well-planned skid road system, a system that based on the frequency of use and the associated soil compaction can easily become permanent. Permanent roads reduce a stand's overall productivity and permanently alter

hydrology. Sediment production from forestry operations can be significantly reduced by using sound engineering standards along with professional judgment and expertise (i.e. Best Management Practices) (Yoho, 1980).

Finally, the economic benefits of uneven-aged silviculture are hotly debated. One study shows that while the value of standing timber increases and the mean periodic annual increment (PAI) can be sustained over a relatively long period of time, in this case fifty years, with uneven-aged management, there is still a fairly dramatic shift in species composition, and as a result, a decline in overall stand diversity (Schuler, 2004; Schuler & Gillespie, 2000). In this particular study, the number of different oak and hickory species significantly decreased while red maple (*acer rubrum*) and sugar maple (*acer saccharum*) significantly increased (Schuler, 2004; Schuler & Gillespie, 2000). In the absence of fire and other disturbance and the presence of browsing by increasing numbers of white-tailed deer and a management regime that limits the amount of sunlight reaching the forest floor, it is relatively tough to regenerate fairly shade-intolerant species such as oaks, hickories, yellow poplar; species that are often the most economically valuable (Schuler, 2004). Furthermore, a decline in oaks and acorn production, a major source of hard mast, along with new, invasive forest pathogens, expected as a result of global warming, relegating potential shade-tolerant, hard mast producers like beech to the understory is a major concern for wildlife (Schuler, 2004).

Low-Impact Harvesting

“Low-impact harvesting” is a combination of several factors. These factors include minimization of residual stand damage, protection of water quality, minimization of erosion and soil compaction, and protection of sensitive areas such as riparian zones. Small-scale systems are commonly preferred because they are perceived as more environmentally friendly by NIIPF landowners and because they can be more cost effective on partial cuts and smaller lots (Updegraff & Blinn, 2001). Small-scale systems include small agricultural tractors that have been modified for forestry operations, small, tracked skid-steers, small, forwarding trailers with a loading boom, small, cable-yarders, ATVs, and draft horses. Larger systems, although lower to the ground, having wider tires, or having the ability to carry logs completely off the ground have higher

transportation costs and capital investment costs. In addition, they are not maneuverable and flexible enough without a highly skilled operator to complete partial, smaller cuts with minimal residual stand damage.

Studies show that small-scale harvesting systems with lower capital costs optimize at lower levels of productivity (Updegraff & Blinn, 2001). It is rarely economically feasible to use small-scale systems to harvest lower value material on less productive cuts (i.e., harvests as a result of uneven-aged silviculture, timber stand improvement (TSI), and other improvement cuts) (Jensen & Visser, 2004). Small scale systems, although lighter and more maneuverable, may also result in more skid-trail construction than would be the case using larger more conventional equipment.

Furthermore, small scale-systems tend to require more operator skill in an effort to maximize productivity, are more labor intensive, and have problems meeting OSHA logging safety requirements (Updegraff & Blinn, 2001). Safety standards currently lacking in many small-scale systems include: OSHA-approved roll bars, reinforced belly pans, liquid-filled rear tires, radiator guards, valve stem protection, engine guards, cab protection, safety glass, and hydraulic tanks (Updegraff & Blinn, 2001; Shaffer, 1992). Larger, more mechanized logging equipment tends to be safer than small-scale systems. Mechanized logging equipment allows the operator to spend more time completing dangerous tasks (i.e. cutting to length, loading, and hauling trees) in an OSHA approved cab (Bell, 2004). Some small scale systems have been modified for forestry operations, including the addition of falling object protective structures (FOPS), and/or rollover protective structures (ROPS), and cab enclosure.

Other Important Factors Leading to Success or Failure

In addition to being economically feasible, socially acceptable, and ecologically sound, the cooperative venture must overcome hurdles of leadership, risk and uncertainty associated with non-conventional management practices, and restrictions based on federal, state, and local laws (Williams & Ellefson, 1997). There are many challenges and barriers to successful forest landowner cooperation. Fear of losing autonomy over land use and management, lack of power base, risk and uncertainty associated with non-conventional management practices, restrictions based on federal, state, and local laws, time limitations, inadequate resources, and indifference to issues are all potential barriers

and challenges discouraging or preventing participation in some form of forest owner partnership (Williams & Ellefson, 1997).

Cooperation also requires effective leadership, membership and retention, start-up costs, costs of low-impact harvesting, as well as marketing. Most challenges are inherent to all cooperative ventures, but some issues are specific to forest landowner cooperatives. Effective leadership is needed to establish a clear vision, mission, and direction for the business. Leadership is a fluid concept and is not necessarily restricted to one person (Allen et al., 2002). Various members of the cooperative effort can at various times take on leadership roles and be effective leaders. A lack of effective leadership will certainly discourage prospective members and dishearten current members. Regardless of how leadership manifests itself in any given group, effective leaders typically have the following attributes: a sense of responsibility for the group in all its facets (human, financial, task accomplishment); a risk taker and accepting the risks to maintain strong direction within the group; able to communicate clearly the goals and objectives; use a leadership style appropriate to the situation, and which encourages support and cooperation from the members; perform to a high personal standard as an example to promote high standards within the group (Allen et al., 2002).

It can also be hard for cooperatives to draw in and retain membership. This can be a matter of poor marketing or simply, evolving membership goals. Not only do cooperatives have to market well for membership, but they also have to market their products well and know whether or not markets exist or could exist for their products.

Chapter Four: Methods

Data Collection and Analysis

The method used in this study was a multiple case study, qualitative approach described by Yin (1988). A case study approach is an “empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between context and phenomenon are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1988). While in an exploratory study there are many possible, appropriate research strategies, this particular approach allows flexibility in that hypotheses are not predetermined and questions can be modified as new information comes to light (Yin, 1988). Also, a qualitative approach allows the researcher to collect rich, in-depth data about a poorly understood, exploratory topic such as forest cooperatives (Miles & Huberman, 1984; Yin, 1988; Strauss & Corbin, 1990).

There are three common concerns with a qualitative, case study approach (Yin, 1988). The first two are bias and the use of equivocal evidence in drawing conclusions. Although not commonly discussed, these concerns are issues with most types of methodology, not just case study research. The researcher must take every possible step necessary to avoid such problems, including theory building based on a thorough review of the literature and having others propose alternative theories and explanations during the analysis phase (Yin, 1988). The third concern is that the case study approach provides little basis for scientific generalization. A case study should be viewed like a single experiment. While you cannot enumerate frequencies or generalize to a population from a single experiment or in this case a case study, you can expand and generalize theories (Yin, 1988).

Four detailed case studies were developed: the Blue Ridge Forest Landowner Cooperative, Appalachian Sustainable Development’s Sustainable Woods Program, The Nature Conservancy’s Conservation Forestry Program, and Grayson LandCare, all located in Southwestern Virginia. In addition, three additional cases were developed for comparison purposes, but in somewhat less detail: Massachusetts Woodlands Cooperative, Mountain Association for Community Economic Development, and Healthy Forest Healthy Communities Partnership.

Data were collected using semi-structured interviews with follow-up interviews, e-mail exchanges, electronic discussion board postings shared among participants, documents produced by the organizations, and participant-observation during organizational, administrative, and public meetings. Qualitative interviewing can be an important aspect of data collection. It allows the researcher to access others' meaningful, knowledgeable, and in some cases, more explicit perspectives (Yin, 1988). Interviews were conducted during January-March 2006 with key informants from the four main case studies: five cooperative organizers, six natural resource professionals (both government and private), two non-industrial private landowners, five current members (and affiliates) of the different cases, two members of local government, and two buyers and consumers of both traditional and niche forest products. Informants are different than respondents in that they are asked not only facts and opinions but also to propose their own insight into certain occurrences and situations (Yin, 1988). Interviewees were identified both by targeted sampling and a technique commonly referred to as snowballing, that is informants were identified as persons of interest based on information provided or identification by previous informants during interviews and through subsequent e-mail contact (Zikmund, 2003). The interviews ranged anywhere between thirty minutes and an hour and a half. Many informants were interviewed numerous times. The interviews were taped and transcribed. A record of primary data collection was kept. (Appendix B).

An interview script was created based on the five criteria: (1) community enhancement; (2) social feasibility; (3) environmental sustainability; (4) economic feasibility; and (5) other important factors, developed in the literature review (see Chapter Three). Although comprised of multiple, possible indicators, the script was primarily used as a guide because of the exploratory nature of the study. (Appendix A).

Documents reviewed for this study included feasibility studies, business plans, budgets, proposals, memos, agendas, written reports of events, newspaper clippings, press releases, and formal studies. These data were used to corroborate information obtained during interviews and participant-observation and to better understand how certain aspects of the case-studies have changed or stayed the same over time (Yin, 1988).

Data were organized and analyzed using NVivo 2, a qualitative software package manufactured by QSR International¹. Data from the interviews were first analyzed during the interview, next immediately after the interview in an interview debriefing session, third during the “open coding” process, a process whereby symbols or abbreviations are applied to words or groups of words so that the researcher can identify, pull out, and cluster segments relating to a hypothesis or theory, and fourth during a second coding process called “axial coding” (Miles & Huberman, 1984; Strauss & Corbin, 1990). Codes were cross-referenced and grouped during this last process.

Throughout this process the emergent findings were confirmed through explanation building and triangulation with other interview data, observation data, and with written documents (Miles & Huberman, 1984; Yin, 1988). Triangulation is the “use of multiple sources of data or ‘views’, with the aim of bringing many perspectives to bear on the situation” (Richards, 2005). Inconsistent findings were discounted. Bias was minimized by having multiple, different kinds of measurements, providing repeated verification (Miles & Huberman, 1984). Preliminary results of the analysis were shared with key informants for further verification. Findings were revised and expanded based upon data collected from this membercheck (Yin, 1988).

¹ NVivo 2 is a qualitative software package manufactured by QSR International. Copyright 2003-2006.

Chapter Five: Case Studies

Case Study Descriptions

Appalachian Sustainable Development (ASD)

Initiated in 1995 as a strategic response to out-migration of young people, high unemployment rates, and years of environmental degradation, Appalachian Sustainable Development (ASD) is a non-profit organization servicing a ten-county geographical region located for the most part in Southwestern Virginia, but also in Northeast Tennessee. ASD's goal is "to help diversify and strengthen the local economy while at the same time encouraging conservation of local natural resources and investment in local natural capital", primarily through the private-sector with market-based mechanisms (Appalachian Sustainable Development, 2006). ASD offers the community educational and technical assistance in sustainable forestry, agriculture, and wood products production. It also provides access to needed infrastructure and services, ecologically sensitive management and eco-friendly product processing and labeling, by which forest and farm landowners as well as local wood manufacturers can market their products. Although Appalachian Sustainable Development's emphasis is on more than forestry and wood products production in its effort to invest in natural capital, the following analyses will focus primarily on these two programs.

ASD's sustainable forestry and wood products program's primary goals are 1) "to improve the quality of forest practices on private lands" and 2) "to encourage local processing of forest resources in order to add value and create jobs" (Appalachian Sustainable Development, 2006). The program seeks to achieve its goals in several ways. First, it provides free educational and technical assistance in forest management, harvesting, and processing to local loggers, sawyers, foresters, and landowners in the form of workshops, field days, and one-on-one contact. In addition, it provides free or at least relatively inexpensive forest management services to local landowners by contracting with local loggers and foresters. A forester, contracted with ASD, will work with a landowner to develop a long-term forest management plan. This plan, while adhering to ASD's Standards of Sustainable Forest Management, is based on the

individual landowner's objectives. If a management plan calls for some type of harvest operation (i.e., TSI, thinning, group selection, etc.) and a landowner is interested in continuing to work with ASD, a logger will then be contracted by ASD to harvest according to that landowner's management plan. It is important to note that at no time, even after receiving a free management plan, does the landowner have any obligations to ASD. They do not have to act on their management plan nor do they have to sell to ASD's woods processing center. ASD markets their services and operations to landowners as well as ecologically-minded service providers primarily via word-of-mouth as well as indirectly through their educational programs, literature, and media exposure. ASD provides an economic incentive for participation by buying logs directly and paying a premium to both the landowner and logger, approximately 20%-50% above market value.

ASD has sought to develop a market for raw, sustainably managed forest products by buying logs directly, processing them locally at their wood processing center, and selling end products (i.e., "character" flooring, trim, ceiling panels, wainscoting, S4S boards, etc.), made from traditionally lower value species. Operations at the processing center include the milling, drying, and transportation of a number of green as well as kiln-dried forest products. Currently the wood processing center includes a log yard, a solar kiln, as well as a storage building. In the next year, ASD plans on more than doubling their processing center's capability by adding an additional kiln which is both larger in size and faster in drying time than their current kiln. Their ability to fund this addition has come from several grants and loans including the Virginia Tobacco Commission, the Austin Fund, and Blue Moon Fund. As a part of their program, ASD has also created a unique product label, Sustainable Woods™, which signifies source verified, sustainable forest products. This allows consumers to both differentiate the product from others as well as the ability to trace it back locally.

All currently identified markets are within 500 miles of ASD's wood processing center. ASD markets their products to wood manufacturing businesses, to builders and architects interested in green design and construction, and to consumers willing to pay a premium for independently certified, local materials. Currently, the most realized consumer-based market seems to be approximately 250 miles northeast in Charlottesville,

Virginia, although potential markets identified by the organization include Asheville, North Carolina, Lexington, Virginia, Roanoke, Virginia, as well as Blacksburg, Virginia. The market in Charlottesville is fairly sophisticated, driven largely by the presence of a green building community and conservation-minded consumers. ASD recently hired a market specialist in the area.

Natural resource education, environmental awareness, improved community capacity, relationship building, an improved local and regional economy and a successful business are all viewed as desired outcomes of Appalachian Sustainable Development's Sustainable Woods program. ASD has thus far used grants and loans to fund both their services and operations in their start-up phase. These funders include, but are not limited to, organizations like W.K. Kellogg Foundation, Ford Leadership for a Changing World, Blue Moon Fund, and Wallace Genetic Foundation. Specifically, some of their funders have set economic feasibility as criteria for future funding. As a result, ASD has recently (October 2005) developed and submitted a business plan to the Blue Moon Fund, which addresses Appalachian Harvest™, their sustainable agriculture program, as well as Sustainable Woods™. The business plan promises two economically, self-sustaining businesses within five years.

Once ASD has developed a successful model, they are interested in replicating it elsewhere in the region. The hope is to show entrepreneurs, interested communities, and potential investors that local, sustainable products can be relatively affordable to the consumer, can provide better revenue to the landowner, can provide environmental, social, and economic benefits to the community, and not much capital. In the case of ASD's forest products program, it has thus far taken approximately \$600,000 to make this endeavor viable. Replication costs might be less because valuable lessons were learned during the start-up phase.

Blue Ridge Forest Landowner Cooperative (BRFC)

The idea of the Blue Ridge Forest Landowner Cooperative (BRFC) exists because Harry Groot, a resident of Southwestern Virginia and provider of low-impact logging and wood processing services desired to expand his business practices so as to enable more forest owners to benefit from sustainable forest management, including benefits to the local economy from local value added processing. Groot worked within the region to

develop and promote this idea, especially with a local FSC certified forester, Britt Boucher, and with the director of the local New River Valley Land Trust, Jerry Moles. Having received its incorporation status in October of 2004, under the statutes of the Commonwealth of Virginia, the BRFC, when fully up and running, will be comprised of a group of landowners who have come together in the form of an incorporated business in the hopes of providing services and benefits, including economic ones, to its members/owners. The cooperative, still in its start-up phase, is actively pursuing Forest Stewardship Council certification and a business plan focused primarily on value addition. The BRFC is a for-profit, producer cooperative primarily focused on providing its members services that might not otherwise be possible without resource pooling. These services potentially include: certified forest planning and management, marketing of value-added forest products, education, low-impact harvesting, and processing. At this point, it is not clear as to whether or not the cooperative will provide all the services or contract some out to local service providers. The BRFC's mission is, "helping forest landowners practice profitable, sustainable forestry."

The Blue Ridge Forest Landowner Cooperative is directed by five board members and Mr. Groot, the CEO. Currently, there are forty or so families on the cooperative's newsletter mailing list; however, the cooperative estimates that it needs only twenty-five members to begin its operations. In addition, the cooperative also needs to sell at least 275 shares of investor stock such that the aggregate purchase price of investor and member stock equals \$150,000. This is an arbitrary number set by the cooperative's board. In other words, the cooperative's board has decided that it needs, at a minimum, \$150,000 in capitalization to be successful. If during the cooperative's offering period, which is approximately six months, the co-op does not generate \$150,000 from a combination of grants as well as common and investor stock purchases, monies will be returned to the stock purchasers and the cooperative will cease to exist. The cooperative is set up such that the cooperative's five board members and CEO are the primary decision-makers; however, decisions must be approved by the member/owners. For the past three years or so, the group has met once a month to discuss the current and future status of the cooperative. Furthermore, daily e-mails are exchanged and discussions are

held among group members via an established on-line community called Blackboard™. In the future, the board will likely meet just once a quarter.

The cooperative is a traditional cooperative in that each member/owner will have one vote and the profits generated from the cooperative will be returned to members in proportion to their use of the cooperative (i.e., patronage). Membership in the cooperative is by application and requires that a landowner, having at least ten acres of forestland in Virginia, be a resident of the Commonwealth of Virginia. It also requires that members remain in good standing. This designation is achieved when a member purchases at least one share of common stock at \$500 a share, pays their annual membership and certification fees, and patronizes the cooperative as dictated by the member's forest management plan. Potential members must also have in place or be willing to develop a forest management plan that adheres to Forest Stewardship Council (FSC) management principles and must do this within a year of joining the cooperative. The co-op will also offer a preferred (or investor) stock option for potential investors. Preferred stock is an attractive option for potential investors because in the event that the cooperative is in the position to pay out dividends, preferred stockholders are paid first and can be paid up to 8% per year of the par value of such shares. Preferred stock is sold in \$500 increments, and while requiring that the purchaser be a Virginia resident, it does not require that the purchaser have land.

So far, the cooperative has used various technical, educational, and financial resources to get established. They have solicited technical assistance from a local FSC certified, forestry company, Foresters, Inc, the Virginia Department of Forestry as well as the local land-grant university, Virginia Tech. They have solicited educational assistance by attending workshops put on by the Community Forestry Resource Center, Cooperative Development Services, and Rapid Improvement Associates, LLC. They have received financial assistance through grants from the Southern States Co-op Foundation, the Community Forestry Resource Center, and the Appalachian Forest Resource Center. Total grant money to date is approximately \$10,000. The Southern States Co-op Foundation also has provided in kind services of lawyers and accountants in excess of \$100,000 to develop the cooperative's business prospectus. Originally, federal assistance was minimal because eligibility for such funding is dependent upon co-op status. Now,

federal assistance along with private grant assistance is minimal because the cooperative has made a financially driven decision to not seek large amounts of grant money.

Natural resource education, environmental awareness, improved community capacity, relationship building, and a successful business are all viewed as successful outcomes of the Blue Ridge Forest Landowner Cooperative. In its early stages, the Blue Ridge Forest Landowner Cooperative has faced relatively few barriers and challenges in its quest for economic feasibility. Perhaps the chief problem has been a lack of access to capital. This is not uncommon to these types of cooperatives. Start-up costs for a forest landowner cooperative that is third-party certified and is in the value-added business are quite high. Capital is needed to become legally incorporated. Capital is needed to purchase harvesting and processing equipment, if these services do not already exist and are contracted out. The cooperative's current estimates for this are as high as \$691,000. Capital is needed to adopt a group certification scheme which is currently estimated at approximately \$25 per acre. And finally, capital is needed to run the business (i.e., staff, space, administration, professional services, etc.). The Blue Ridge Forest Landowner Cooperative has tried to overcome this barrier by taking things slow and by trying to gain access to capital from traditional loan sources such as banks.

Start-up capital will come primarily from investor and common stock purchases. The cooperative does not expect to pay out dividends in its first several years. The cooperative also does not expect to pay a stumpage fee to the members in its first several years due to a lack of initial liquidity. Members will instead receive a credit to their account based on market value at the time of harvest in addition to interest.

The completion of the cooperative's business prospectus, the final step needed in order for the cooperative to solicit members has been quite time consuming, approximately two years, and thus has been discouraging for board members as well as potential members over the years.

Conservation Forestry Program (CFP)

The Conservation Forestry Program in Southwestern Virginia is derived from a similar program initiated by the Nature Conservancy in the mid 1990s called the Forest Bank™. The Forest Bank™ was largely a response to TNC's efforts to improve environmental quality and minimize sediment in the Clinch River, protecting sensitive

freshwater mussel habitat. It was also a response to some of the same factors leading up to the creation of Appalachian Sustainable Development, those being out-migration of young people, high unemployment rates, and years of environmental degradation. Originally, the Forest Bank™ was established as a for-profit institution in which landowners could deposit, in perpetuity, their timber rights. The Forest Bank™ would then sustainably plan, manage, and harvest timber on the land creating revenue for the bank. In exchange for signing over their timber rights, the landowners would then receive an annual dividend payment based on some percentage of the original value of their timber. In addition, the landowner also retained the right to “cash out”, if in need of money quickly, receiving a payment equal to the original value of their timber. The Forest Bank™, in theory, balanced ecology and economics by providing sustainable forest management as well as a steady stream of income to forest landowners. The bank also planned originally to develop or in some cases create local markets for raw as well as end-use forest products. Harvesting, milling, and processing would be done as local as possible.

Because the Forest Bank™ was the first ever business of its kind, it faced many unforeseen challenges. Pilot studies were set up in Southwestern Virginia as well as Indiana. Upon registration with the Federal Securities Exchange Commission (SEC), the bank was required to place in its business prospectus, already full of legal jargon, roughly eight pages of disclaimers explaining that the business was in fact the first of its kind and because of this there were a number of unknown risks. The disclaimers, alone, lead TNC to rethink the Forest Bank™ because they made marketing difficult. In addition, the SEC restrictions dramatically eliminated the Forest Bank’s flexibility to tailor agreements with each landowner to best meet their particular needs. SEC requires that each owner of stock be treated the same, but forests, forest owners, and forest plans are rarely the same. In order to attract landowners in Southwestern Virginia, TNC realized program goals could more or less be achieved through the use of conventional easements thus leading to what is now the Conservation Forestry Program.

The difference between a traditional easement and the easement used in the Conservation Forestry Program is that the holder of the easement, in this case TNC, owns outright and in perpetuity the timber rights on the forestland held under the easement.

Written into the easement is the agreement that TNC must make an annual payment to the landowner based on some percentage of the timber's original value at the time the landowner enrolled in the program. The timber is revalued every ten years or after a harvest. Importantly, the annuity, although it can stay the same from year to year, can never decrease. Planning and management is done by a local consulting forestry firm, Fountain Forestry, and responds to the landowner's objectives. Harvesting, whether low-value from TSI or mature wood in a traditional sale, must be a part of the management plan in order for the landowner to receive the annuity. All management prescriptions and harvesting operations must also follow Forest Stewardship Council standards.

Currently, TNC has relatively few landowners, a dozen or so, who have enrolled a total of approximately 20,000 acres. The relatively small number of participants may in part be due to the fact that while the easement offered in the Conservation Forestry Program is fairly attractive based on the annuity, getting landowners to participate in the program has thus far been a relatively lengthy process involving a fair amount of trust building on the part of TNC and a very big commitment on the part of the landowner. Under the easement, TNC owns out-right the timber rights in perpetuity. Along with a steady stream of income, the landowner may still hunt, recreate, and have access to a certain amount of firewood as appropriated by their forest management plan but they give up any liquidity. They no longer have the ability to access cash quickly. TNC assumes all risk and liability associated with the program. At this point, TNC is not actively pursuing new landowners.

Program costs include, for the most part, administration, planning, management, and landowner annuities. With the forests primarily in need of TSI and other improvement cuts, these costs are hard to recover upfront. In 2005, timber harvests on program land generated approximately half the revenue needed to meet obligations to the landowners enrolled in the program. This does not include any program administration costs. TNC expects to generate about two-thirds of the revenue needed to meet obligations in 2006. While seemingly a positive trend, the program administrator expects that there will be some years in the future, where costs will exceed revenue.

Fundraising assisted the start-up costs associated with the Forest Bank™. The Pew Charitable Trust awarded a \$400,000 grant over two years to TNC's Center for

Compatible Economic Development (CCED) to develop community-based programs for sustainable rural development. \$160,000 was used by the Forest Bank program for preliminary analysis and planning prior to program start up. The Conservation Forestry Program also has access to TNC's internal funding mechanism to maintain and support administrative costs. TNC estimates approximately 60,000 acres are needed in order for the program to be economically self-sustaining.

Improved environmental conditions, maintenance of biodiversity, natural resource education, environmental awareness, improved community capacity, relationship building, an improved local and regional economy and an economically feasible program are all viewed as successful desired outcomes of the Conservation Forestry Program. The Conservation Forestry Program endorses and seeks FSC certification for its forest management because it further ensures high environmental standards.

Grayson LandCare (GL)

Grayson LandCare is an emerging community network initiated in early 2005 by Dr. Jerry Moles, member of the New River Land Trust Board of Directors. Grayson LandCare is largely a response to issues such as out-migration of young people, environmental degradation as a result of poor forest and agricultural practices, in addition to high unemployment rates. Before coming to Southwestern Virginia where his family's history dates back to the late 1700s, Dr. Moles worked as a consultant, primarily internationally and in the Pacific Northwest, on various natural resource and community related issues. Dr. Moles moved back to Southwestern Virginia in 2000.

In talking to a neighbor one afternoon about conservation easements available through the Western Virginia Land Trust, Dr. Moles was invited to and decided to attend a start-up meeting at a local library for what was to eventually become the New River Land Trust. The New River Land Trust originally focused its efforts on just two counties in the New River watershed. It wasn't until later that it was decided that watershed or landscape level planning would be necessary if the land trust was truly going to be able to achieve its various program goals, all of which are centered on protection of the New River and its water. Along with expanding the region serviced by the program, there was also a realization by those involved that conservation easements alone would not protect the watershed. Thus, Dr. Moles, along with other members of the New River Land Trust,

began a campaign focused largely on the identification and engagement of community members interested in landscape level management.

To jump start the campaign, Dr. Moles along with other NRLT members held large informational meetings. These meetings covered traditional forms of land protection such as conservation easements, the Forest Legacy Program, and fee-simple ownership. He also put out a series of press releases to the local newspapers and other local press, focusing primarily on communicating the importance of land conservation and watershed protection and what exactly the New River Land Trust was all about. Some key actors immediately identified were a consulting forester with a local, environmentally sensitive consulting forestry firm and an owner of a grass fed cattle operation engaged in rotational grazing. In talking with other community members, Dr. Moles found that people generally lacked access to much needed information and were not actively engaged in information exchange pertaining to relevant, pressing issues. To help meet this need Dr. Moles applied for and received a National Fish and Wildlife Foundation grant. This grant's purpose is to help increase the incomes of local people in Grayson County by helping them to invest in and build on their natural assets.

Dr. Moles' efforts have been a catalyst for creation of a grassroots organization called Grayson LandCare. Its primary purpose is to use partnerships with businesses, non-governmental organizations, community leaders, government agencies, the local land grant university, and other civic stakeholders, identify and solve problems specific to their community. Thus far, the group has structured itself into four main committees: forestry, livestock, water, and communication, and hopes to solve natural resource related problems through a unique combination of sustainable land management practices, value added processing, and market-based cooperative business organizational strategies. Grayson LandCare is in the process of expanding their network horizontally as well as vertically to Virginia Tech, the US Department of Agriculture, USA Landcare, and the Natural Resource Conservation Service among other organizations.

Improved environmental conditions, increased productivity of environmental capital, natural resource education, environmental awareness, improved community capacity, relationship building, an improved local and regional economy are all viewed as

successful outcomes of Grayson LandCare. It is difficult to predict what kind of successes Grayson LandCare will achieve because the group is still so emergent.

Massachusetts Woodlands Cooperative (MWC)

The Massachusetts Woodlands Cooperative, L.L.C. is presented here for the basis of comparison. MWC has had considerable successes where other cooperatives have struggled. The cooperative venture in an informal sense was initiated in 1999 by a group of resource professionals from the University of Massachusetts as well as several other state agencies. Recognizing a need for better ways in which landowners could engage in and practice more sustainable forestry and that cooperation was one such way, the group decided to sit down with several landowners, their initial goal being to try and figure out ways to help people/landowners understand the various benefits of landowner cooperation and keeping land forested. A producer cooperative model was one of many options explored.

The actual cooperative venture, Massachusetts Woodlands Cooperative, L.L.C. was developed and born a few years later in 2001, completely on volunteer time by landowners with the group of resource professionals acting as an advisory committee. It is important to note that MWC is not a formal business cooperative. Rather, it is a limited liability company. An L.L.C. is a mix between a partnership and corporation structure, where owners of the company are called members and have the same protection as a corporation. With a mission “to maintain the environment and character of western Massachusetts through the protection, enhancement and careful economic development of one of the region's most plentiful resources, the forest”, their primary activities are production and marketing. The cooperative was formed under the Massachusetts Limited Liability Act as a limited liability company. It operates like a traditional cooperative in that each member has one vote and a member's profits are realized based on the amount of business he or she does with the cooperative. Forest Stewardship Council principles were chosen at the beginning primarily as a framework from which to organize the cooperative. Organizing around FSC's management principles was a way, according to Paul Catanzaro an extension specialist with the University of Massachusetts, “to attract people of like minds and interests...using FSC to gain access to a particular market was secondary”.

The start-up phase for MWC lasted approximately five years. During this time, the Steering Committee, the Board of Directors, and MWC Resource Group were able to develop a network or collaborative comprised of people having various interests and expertise in areas including FSC certification, sustainable forestry, grant writing, research, wood processing, and so on; all necessary for the success of the cooperative. Through good leadership as well as an environment that encouraged continuous learning, this network, during the extended start-up phase, was able, primarily through sweat equity, to develop a comprehensive database necessary for sustainable forest management and sound business development and an FSC certification protocol. They were also able to perform market research (i.e., a landowner interest study and pilot projects in wood products value addition), to design materials that would convey professionalism, contribute to their advertising and marketing strategy, and differentiate their services and products in the market (i.e., a logo, stationary, business cards, brochures, and a website), develop a business plan, and apply for and receive grant money necessary for start-up. Initial grant money was approximately \$57,500 and was used for organization, incidental expenses, and FSC certification. In 2004, MWC was awarded a three-year \$499,253 working capital grant from the United States Department of Agriculture. The goal of this grant was and is to help expand niche markets centering on FSC certified and value-added forest products.

The certification process was a learning experience for the cooperative. Upon careful consideration, the cooperative found that the most popular forms of group certification (i.e., group manager and resource manager certification developed by Smartwood™) did not really fit. Group manager and resource manager certification were both too expensive and too rigid. So the cooperative, with the help of a \$5,000 grant from the Doris Duke Foundation through FSC, was able to develop its own group certification scheme.

Under this particular scheme, the cooperative, itself, is the certified body. As landowners join the cooperative, a resource team within the cooperative looks at their current management plan, makes recommendations if any changes are necessary, and then monitors the property for compliance. The Tides Foundation awarded MWC a grant for the initial certification which was approximately \$9,000. The cooperative was

initially certified by Smartwood™. MWC is now audited yearly by Smartwood™ under the Small, Low Intensity Managed Forest (SLIMF) guidelines for approximately \$2000 a year. Smartwood™ conducts a systems and management audit of MWC's compliance and monitoring efforts. This unique certification system has allowed the members of MWC access to affordable certification. It has also allowed the members to work with whom ever they choose in developing a management plan as long as the forester and loggers follow FSC standards. This scheme allows the cooperative to maintain good business relationships with local forestry professionals. This agreement has the potential disadvantage of more variability in the quality of forest management and planning services and forest products, but the cooperative has not run into this problem. Also, there are mechanisms to assure quality control, mechanisms like monitoring by both the cooperative and forester during and after harvest.

In an effort to grow a market for and be able to market their FSC managed products as FSC certified, the cooperative cultivated a network of value-added producers (i.e., local mill workers and wood manufacturers) and developed a group chain of custody certification scheme. The scheme is similar to other group chain of custody schemes and includes a tracking and sorting system. The initial certification costs were roughly \$3,500 that were shared by members of the group. Because chain of custody certification was obtained well after management certification and more was know about the availability of FSC certifying bodies, the cooperative sought bids among competing certification service providers. The cheapest bid was placed by Scientific Certification Systems, a certification body out of California and the now the Northeast. The co-op has Smartwood™ as its systems and management auditor and Scientific Certification Systems as its chain of custody certifier.

Management activities, including harvests, are carried out according to the member's forest management plan. When there is a timber sale, the co-op has first right of refusal. The Executive Director of the cooperative meets with the landowner's forester and identifies low to mid value timber the co-op can use immediately. Other higher value timber, if any, is placed in a traditional bid sale. This is the case because the co-op simply cannot compete and does not want to compete in the high value wood market. They can, however, compete in the low to mid range value market. So basically, if the

co-op thinks it can make more money for the landowner through value addition activities than the landowner would make in a traditional sale, the co-op buys the timber. If the co-op can't make more money, the timber is then sold traditionally. MWC's decision to not compete in the high-value market was also a strategic decision by not competing in a high-value market they are able to maintain good business relationships with the local, larger forest industry.

The cooperative then contracts the initial sawing out to local wood-processors (mill-owners). Millers and other members of the group chain of custody certification set up by MWC then have the option to buy raw products from the co-op or not. The cooperative currently estimates needing 250K bf a year coming through the cooperative in order to cover their overhead (i.e., staff, space, professional support such as lawyer, accountant, etc.) and still make a profit. Profits will be returned to members in the form of dividends.

The cooperative sells raw lumber and flooring made out of cherry, red maple, red oak, sugar maple, white ash, yellow/black birch, hickory, beech, white birch and white pine. The cooperative's market is proximate to the land and landowners, in some cases, within ten to fifteen miles. Also, there are five major universities within one-hundred miles that provide a discerning market. It is also important to note that there was also a previously established market for locally grown and certified wood at a premium prior to the start of the co-op. Local landowners and public and private institutions have been the cooperative's primary customers up until recently, but now, they are seeing an increase in interest from architects and builders associated with the LEED program.

The cooperative, because it is a relatively low-risk venture for its members, has a very diverse, at least from a socio-economic and gender perspective, membership and has been fairly successful in membership growth. Landowners pay \$250 to join and are promised 80% of that back if they decide to leave the co-op. This has been criticized because some think that the level of risk (very low) does not create enough incentive for the landowners/members to make the endeavor work. Currently, membership is at forty-five members managing approximately 5,000 acres. The cooperative is aggressively pursuing landowners, land, and wood. Overhead, thus far, has been manageable due to the large USDA value-added market research and development grant received (\$500,000)

and a recently received Sustainable Agriculture Research and Education program (SARE) grant in the amount of \$112,625.

Mountain Association for Community Economic Development (MACED)

Like Appalachian Sustainable Development, MACED is a non-profit organization seeking to reach its goals, primarily through the private-sector. MACED's primary area of focus is Eastern Kentucky, a part of Central Appalachia as designated by the Appalachian Regional Commission. MACED's work centers in four major areas: development of and investment in local businesses, building of and investment in environmental capital, policy development, as well as fostering partnerships and collaboration. More specifically, the group "provides financial investment and technical assistance to local people, communities, and businesses, conducts research to inform and support well thought out public policy, and craft development tools" (Mountain Association for Community Economic Development, 2006). While MACED's work is much broader, the following analysis will focus on its Forest Opportunities Initiative (FOI), a program which seeks to encourage and provide incentives for low to moderate income landowners to invest in ecologically sustainable forest management.

The Forest Opportunities Initiative has four major goals: 1) "to increase the financial return to that landowners get from their timber over time", 2) protect important environmental, recreational and aesthetic benefits of forests, 3) "improve overall quality of Eastern Kentucky's forests by increasing the number of acres under deliberate management" and 4) "educate landowners to the economic and environmental benefits of forest management" (Mountain Association for Community Economic Development, 2006). The program is seeking to accomplish these goals with three basic strategies. First, in realizing that many landowners, especially low to moderate income landowners, have competing needs for cash and often have short-term cash needs, the FOI provides landowners with access to cash through a loan, the "Forest Asset Protection Fund", allowing them to delay a potential harvest for needed cash. The program also allows the landowner to access investment capital through what is being called the "Forest Asset Growth Fund". This allows for TSI and other improvement cuts to be performed in an effort to increase the value and overall quality of the standing timber. Finally FOI offers landowners relatively easy access to professional forestry expertise.

For interested participants, MACED will have a professional forester conduct a timber inventory and evaluation. Based on this assessment, strategies will be discussed and brought to the attention of MACED's finance staff. If the landowners remain interested, a lien will be taken out on the standing timber, ownership will be established, and a loan amount and interest rate will be confirmed. The loan (cash loan, investment or both) will then be dispersed to the landowner. A MACED forester will then develop a management plan that takes into account aesthetics, long-term economic value, sensitive areas, as well as biodiversity, make TSI prescriptions where needed, and monitor the land annually. At the time of harvest, a harvest plan that meets all existing Best Management Practices as well as the standards set for by Kentucky's Forest Conservation Act will be generated. A portion of the loan or interest on an investment is to be paid at harvest.

Healthy Forests Healthy Communities Partnership (HFHC)

Based in the Northwestern region of the United States, this is a partnership which has very similar goals to that of the cooperative endeavors analyzed within this thesis; however, the HFHC partnership is a different in its structure and primary functions. HFHC, rather than dealing in all aspects of the forest products supply chain, primarily deals in marketing of sustainably procured forest products. HFHC was established in 2002 and is currently comprised of rural leaders, local non-profits, wood manufacturers, as well as several resource managers. The primary goal of the partnership is to find "market-driven solutions for forest restoration and community vitality" (Healthy Forests, Healthy Communities, 2006).

The partnership is for the most part virtual (i.e. there is a comprehensive website with information and knowledge useful to the fifty current members, potential members, as well as customers and potential customers interested in buying from HFHC partners). HFHC holds annual meetings and skill building workshops. HFHC primarily provides marketing services (i.e., a HFHC product label, market research, media exposure, marketing materials, FSC chain of custody certification, etc.) for its members but also provides capacity building (i.e. trainings and workshops, small grants funding, peer-to-peer learning, collaboration) and other business related services (i.e., comprehensive product tracking services, newsletter, information on financial and manufactured capital resources).

HFHC is an intriguing model because it focuses its efforts on one link in the forest products supply chain. HFHC supports local businesses with various marketing services and connects them with producers of sustainably grown raw material and consumers of end products. HFHC also adds value via a product label to local products, ensures good forest management through site visits and third-party chain of custody certification, and is no risk for members. Member commitment consists of a \$150 yearly membership fee.

Chapter Six: Results and Discussion

Comparison and Contrast of Case Studies

One purpose of this study is to better understand the contributions cooperative ventures can make to the challenges of sustaining ecologically functioning forests and the communities that depend on them. These challenges rise from the changing context of forestry and forest land ownership reviewed in the introduction (i.e., globalization, urbanization, aggregation of forest industry, niche markets, new products, and devolution of regulatory authority from federal to state to local and market based solutions). More specifically, the paper compares and contrasts the case studies presented in Chapter Five using as criteria environmental sustainability, community functioning, and economic development explained in Chapter Three. In addition, the analysis will assess key factors affecting the feasibility of forest cooperative ventures. This analysis will provide a better understanding of factors making forest cooperative ventures successful and it will provide a better understanding of the contributions forest cooperatives can make to forestry, forest-based communities, and society at large.

Environmental Sustainability

All of the forest cooperatives place great emphasis on restoring and protecting environmental quality (Table 1). At a minimum, they all agree with practicing voluntary, state Best Management Practices which in Virginia and Southern Appalachia primarily address water quality. In addition, they address other aspects of environmental sustainability.

Fragmentation and Conversion

Many forest owners have opportunities or pressures to convert part or all of their forests into real estate developments. Quick, easy, large profits are hard to resist, but even those who would rather not sell their property may sell because they need to pay taxes, other land management expenses, or other personal expenses such as college tuition, weddings, and retirement. The resulting fragmentation of forested ecosystems has environmental and social impacts, and the whole process has been likened to a tragedy of the commons.

TNC's Conservation Forest Program addresses fragmentation directly with formal easements on enrolled properties that prevent fragmentation and conversion. The program compensates landowners with an annual payment (i.e., some percentage of the timber's original value), in perpetuity, for lost control over timber harvests on their properties.

The other programs rely on increased cash flow from forest products enabled by value-added cooperative forestry programs as the means to encourage forest owners to retain ownership. Such a motivation would be particularly powerful if cash flow equals or exceeds long term profits available from development options.

LandCare holds out the promise of landowners realizing increased profits from improved management. Several of the primary advocates of LandCare speak about increasing landowner profits several fold through rotational grazing, timber stand improvement, deluxe private camping, and other professionally proven techniques that can be realized through good advice and proper management. Some of these promises have been realized with grazing cattle, but the venture is too new to have affected profits from forest management.

ASD's processing operation that enables profitable extraction of lower grade timber because of value-added processing provides some additional cash flow to participating landowners. The details of this operation are discussed below, in the section on economic profitability.

The BRFC is more about providing an affordable service than maximizing land owner cash flow. The service would increase forest health and amenity values, which may translate to higher property values and longer forest tenure.

Biodiversity and Wildlife Habitat

Forests provide habitat to countless wildlife, many of which migrate across property boundaries in search of water, forage, mates, and cover. Forests also house rare and endangered species as well as affect larger regional biodiversity concerns.

The Conservation Forestry Program's primary goal is protecting regional biodiversity, in particular the many freshwater mussels in the Clinch River system. Their efforts to influence timber management are linked directly to minimize soil erosion and

sedimentation. Harvesting and management practices on CFP managed lands are designed to minimize these negative effects. If CFP adds additional acreages into its program, part of the criteria for selection will be those lands with the greatest potential to affect water quality and mussel habitat.

The other cooperative ventures are less specific about biodiversity and wildlife habitat, although all speak generally about a desire to improve these conditions. Informants associated with these cooperatives often use environmental protection as part of their argument to defend uneven-aged silviculture as a preferred management tool. They contend that the resulting forest supports greater biodiversity and wildlife habitat, specifically interior wildlife habitat, which is increasingly rare and vital for many species, less edge habitat, and moist, cool understory conditions which make for good habitat and help mitigate the damaging effects of wildfires. The programs are too new to know if these claims can be justified. It is also unclear if extensive uneven-aged management will result in a decline in oak regeneration and a subsequent decline in acorns, a valuable source of food source for wildlife. This possible trend presents a major concern for wildlife biodiversity (Schuler, 2004). Additionally, as forests move towards late successional forests as they typically do under an uneven-aged management regime, biodiversity of flora is limited to primarily shade-tolerant species.

Forest Health

Forest health involves many dimensions. The focus in this analysis is control of invasive species, regeneration of desired tree species, control of insects and fire, and reducing and repairing high-grading and competition through timber stand improvement to improve stand vigor and merchantability.

All the cooperative ventures have explicit goals to improve forest health. One justification for adding value to lower grade timber is to make affordable thinning and other timber stand improvement operations that would control invasive species, reduce fire and insect risks, increase productivity of residual stand, and removal of genetically inferior stock prolific as a result of high-grading. Several of the cooperative ventures use the oft repeated slogan “worst-first harvesting” to refer to the practice of killing or removing vegetation of lower quality, in poorer health, and/or that increases health risk,

while leaving behind the healthier, higher value, better genetic material to grow and regenerate. Worst-first harvesting is very similar to a pragmatically easier and more cost effective uneven-aged silvicultural technique known as a flexible diameter-limit cut (Miller & Smith, 1993).

Some of the cooperative endeavors have specific policies regarding invasive species management. The CFP, for example, has the control of invasive, exotics listed as one of their key strategies for conserving biodiversity. Chapter Four of the CFP's Forest Operations Manual says TNC will "develop plans to control, and where possible eradicate, invasive exotic species" (Helm et al., 2002). A key informant from the CFP has expressed that currently, program managers as well as stewardship staff are working to develop invasive, exotic species control strategies on a case by case basis (i.e., as invasive, exotics are discovered in individual forest stands). Because the threat posed by invasive, exotics is more serious in some stands than others and because the budget for invasive, exotic control is thin, staff members are researching and identifying potential funding for aggressive treatments on the more immediate threats.

All the cooperatives are motivated to promote species regeneration and forest restoration through silvicultural practices. In general, all four case studies promote a mixture of uneven-aged silvicultural practices (i.e., group selection, single-tree selection, and "worst-first") as their primary silvicultural practices, in preference to clear cutting, seed tree harvests, or other silvicultural practices that open larger areas in the forest canopy and leave behind fewer trees.

ASD has chosen silvicultural standards that for all intents and purposes limit them to the use of uneven-aged management. This set of standards was created and approved by ASD's Board of Directors with the help of Virginia and Tennessee Cooperative Extension, the Virginia Department of Forestry, and ASD's own professional forester. These standards, mostly based in silvicultural prescriptions, address soil, water, wildlife, biodiversity, scenery and other amenities, as well as ecological health and resilience. More specifically and according to ASD itself, they attempt to "mimic natural processes, mimic natural disturbance regimes through single-tree selection, group selection and shelterwood harvests, promote biological diversity through the encouragement of a forest with diverse plants and animals, maintain soil productivity by minimizing soil erosion

and leaving cover on the ground, protect water quality through ground cover and BMPs” (Appalachian Sustainable Development, 2006). ASD is also looking into Forest Stewardship Council certification; however, ASD believes its current standards are equal to if not better than those outlined by FSC. An example of one of ASD’s silvicultural standards is the following:

“Generally, uneven-aged stands within the forest are preferred, canopy openings of any size should be sufficiently spaced to prevent fragmentation of the forest, and any one harvest cannot ‘open up’ more than 10% of the total forest area”.

CFP, while expressing a preference for uneven-aged silviculture, manages according to FSC standards, which do not make any specific recommendations regarding even-aged versus uneven-aged management. The decision to employ a specific silvicultural regime, according to FSC standards, is site specific. An informant from CFP expressed that while uneven-aged management will be the predominant silvicultural tool used, even-aged management will be used on previously high-graded sites in need of complete restoration.

One of the recognized challenges of these practices is regeneration of shade-intolerant and often more valuable species such as oaks that have been systematically removed from the forest by years of single tree selection and diameter-limit high grading. Often times the quickest, most cost effective, most likely to succeed path to regenerating a diverse forest containing these species requires clearing most current vegetation. However, as noted by one of our principal informants, many cooperative landowners dislike clearcuts:

“Silvicultural practices will depend on the individual’s site, soils, history, and species composition. It’s done on a site by site basis. Generally, most of the people involved [in the coop] abhor clearcutting as a practice. So, we’re going in, except for the most horribly in need of that kind of restoration, that will not be a frequently called upon silvicultural tool. I’m expecting a lot of group selection. Single tree selection will definitely be the predominant silvicultural tool used, that will probably always be the case but over time group selection and potential clearcutting or some derivative there of will have to be a more frequent practice”.

Some sort of certification system is being advocated or practiced by all the cooperatives as one mechanism that promotes ecological, social, and economic ends. One of the most common, the Forest Stewardship Council (FSC), has changed its

standards to reflect acceptance of clearcuts, in part to address concerns about regeneration. FSC's initial standards for the southeastern US, "Forest Certification Standard for the Southeastern US", stated that clearcuts should be minimized and uneven-aged management should be used whenever feasible (Forest Stewardship Council, 1998). The version revised in 2005, along with the "Appalachian Regional Forest Stewardship Standard" also revised in 2005, do not make this recommendation (Forest Stewardship Council, 2005b; Forest Stewardship Council, 2005a).

Because of the cooperatives' predilection towards uneven-aged management, some professional foresters in the region are suspicious of the long term impacts on forest regeneration. An informant with the Virginia Department of Forestry had this to say:

"Problem is...in a lot of these groups they are trying to perpetuate a climax type of forest whereas a lot of the species people want in the Appalachians aren't necessarily found in shade-tolerant climax type forests. Eventually there's got to be some type of final harvest, at least in some areas. You got to open it up and you got to allow regeneration to come in."

Another concern held in common by all these cooperative ventures is the desire to use low-impact harvesting techniques to minimize residual tree damage caused when selected trees are felled and transported out of the forest. Smaller equipment and increased operator care are the primary means advocated by co-ops to carry out low-impact harvesting (other practices include: helicopters, forwarders, modifications to conventional harvesting machines, and small cable-yarders) because they are the most affordable and available options for start up operations. Smaller equipment along with higher skill level supposedly reduces soil compaction as well as the incidences of trees striking other trees during felling and skidding.

The BRFC has detailed plans for low-impact harvesting operations using small agricultural tractors as well as small forwarding trailers. A potential system was described in a 2004 BRFC document entitled "Blue Ridge Forests Initiative Proposal".

- Trees are felled manually using directional felling. This technique is well established as the optimal manual felling method that balances safety and productivity while minimizing damage to the surrounding trees.
- An articulated tractor provides the most maneuverable unit with adequate power to skid a reasonable volume of logs from the woods. The tractor

will be equipped with a PTO driven radio controlled winch to allow logs to be pulled from inaccessible locations to the tractor for skidding.

- The logs will be skidded from the woods to a main trail where they will be queued.
- A tractor pulling a self-loading forwarding trailer will pick up the logs queued along the trail. The trailer will have a loading boom to lift the logs from their roadside queue onto the trailer, and which can also be used to sort the logs upon delivery to the sawmill or log deck.

In subsequent documentation and interviews, BRFC admits that it needs to be more flexible than described in the 2004 document, but that description still characterizes a general preference for a low impact style of harvesting. ASD and TNC strive to achieve the same ends by working with highly skilled operators of conventional equipment. They specify detailed standards about residual damage in their contracts and insist logging and harvesting operators abide by these standards or they are not be considered for future logging jobs.

MWC, similarly, relies on conventional harvesting technologies implemented by existing contractors given special directions and rewards to minimize impacts specified in the contract.

Additionally, a concern held by some of the cooperative efforts, namely BRFC and ASD, is the desire to process their forest products with as little impact as possible. The BRFC has detailed plans for low-impact processing by leaving biomass in place at the time of harvest and by using less fossil fuel with the use of a solar-powered dry kiln. ASD, does not have a portable sawmill able to leave biomass on site, however, it is able to use less fossil fuels with its solar-powered dry kiln. Notably, ASD is installing a new, conventional dry kiln in order to increase processing capabilities and economic viability.

Erosion and Soil Compaction

The silvicultural and harvesting strategies mentioned above as techniques to promote forest health are also advocated by the cooperative ventures as techniques to reduce erosion and soil compaction, a high priority goal of all the cooperatives. Some informants argue that uneven-aged management preserves a continuous forest cover, which in turn decreases the total amount of erosion and sedimentation by

catching/absorbing rain and securing sediment with vegetation. The scientific evidence to support this claim is mixed (Yoho, 1980; Hood et al., 2002). In fact, some evidence suggests that the likelihood of soil compaction, erosion and sedimentation increase with repeated entries into a stand every few years to select and harvest a few trees, and especially with the repeated or continuous opening of forest roads required to enable equipment to enter and harvest the selected trees to be removed.

Certification

Certification is another tool that these endeavors hope will enhance ecological sustainability. Certification is a market-oriented mechanism by which sustainable management of resources can be ensured above and beyond voluntary, state-driven Best Management Practices (Meidinger, 2002). It works by explicitly stating a set of standards and practices that will sustain desired environmental conditions. Some certification standards also apply to social and equity concerns, such as living wages, respecting property rights, and empowering indigenous peoples. Certification systems differ in the types of conditions/practices they address, the use of independent or third-party verification, and public disclosure of audit results. FSC is the certification system referenced, if not adopted, by all the cooperative ventures studied here. It has relatively high environmental and social standards, third-party auditing, and requires public disclosure of audit results.

TNC and BRFC have their forest management plans FSC certified through a local, FSC certified professional forestry business. BRFC also will FSC certify its processing and chain of custody so that milled products can be labeled and sold as FSC certified. TNC prefers but is not required to sell material harvested from its properties to FSC certified processors. ASD has chosen to self-certify, using the brand name “Sustainable Woods” and argue that their standards meet or exceed FSC standards. The cost of FSC certification was the primary reason for this decision, a topic discussed in more detail below, in the section on economics and profit. Grayson LandCare has not decided on issues of certification, but an approach similar to BRFC’s approach is being discussed (i.e., FSC certification of land and processing).

Professional foresters in the region support the argument that certification increases environmental quality. They reported a difference in the management on certified lands versus non-certified lands, regardless of the certification system or third-party auditing. For example:

“[We see] very little environmental problems with logging jobs that are under some typed of certification program versus those that aren’t under a certification program. If there are problems, they are taken care of very quickly.”

“I’m all for it [self-certification]. It doesn’t matter. I don’t care what certifying body is behind what I’m doing or what anybody else is doing. If they’re doing good on the land...I’m cool with that.”

“Very practical way to go [self-certification]. I do think that people who set standards for their own organization are far more likely to keep to those standards than landowners or groups of landowners who don’t have any standards to start off with. If the group makes standards that they check up on themselves, it will still raise the standards overall. The practicality of it...I like the idea of having minimum environmental standards within an industry.”

Internal assessments of the Conservation Forestry Program confirm the importance of certification. Preliminary thinking suggests that there might not be a need for a program such as the CFP if certification becomes increasingly popular so that more and more lands become certified. An informant from the CFP said FSC certification is:

“...making TNC think about this program for the long-term. Five years ago that was a foreign concept. There are now, in the area... 140,000 acres certified. Our properties will all eventually be certified, another 20,000 acres. [Another] forest owned by a TIMO is also FSC certified. There is a critical mass developing on the ground and there are foresters changing their minds about certification. Certification of a lot of other acreages is having some of the same impacts that TNC’s program hoped to have. So in essence the original goals are being satisfied by other activities.”

Table 1: Environmental Sustainability

Ecologically Enhancing Policies†	ASD	BRFC	CFP	GL
-Fragmentation and Conversion	Specific	General	Very Specific	Specific
-Biodiversity and Wildlife Habitat	General	General	Very Specific	Specific
-Forest Health	General	General	Very Specific	Specific
-Erosion and Soil Compaction	Specific	General	Very Specific	Specific

†Table 1 represents how detailed each cooperative effort's ecologically enhancing policies are because it is too early to tell what ecological effects, if any, these cooperative efforts will have. The descriptors "very specific" "specific" and "general" are a relative comparison of the case studies. Those rated "very specific" are more detailed than those rated "specific", etc.

Community Enhancement

All of the cooperative ventures studied here enhance their local communities, although some more than others (Table 2).

Grow Local Economy

Cooperatives increase local economic activity by harvesting and processing forest materials that might not otherwise be harvested and processed. Likewise, they can increase local economic activity by capturing locally some of the value added through processing, transportation, marketing, and sales that would otherwise be exported with raw materials. The result can be a direct increase in jobs and taxes from the value-adding industries as well as indirect jobs and taxes generated as the increased wealth gets circulated through the community (i.e., food, gas, banking, health care, real estate, etc.). Because cooperatives may legally buy and process up to 50% of their product from non-members, it is possible for their value-added processing and marketing programs to have a larger impact on the local economy than might be possible if they only processed and marketed timber from cooperative members (Anderson, 2003).

All four cooperative ventures increase local economic activity. All four cooperative ventures explicitly target forest landowners that might not otherwise employ a professional forester, some of these landowners might resist active management of their forest or any extraction for fear of degrading forest health and amenities. Certainly any harvesting and processing for these landowners would be economic activity not otherwise generated.

ASD provides jobs to skilled laborers as well as work for professional service providers. Currently, ASD employs a business manager, marketing specialist, mill manager and yard helper full-time as well as a yard helper part-time. In addition, ASD contracts part-time with one forester and full-time with one sawyer. ASD also contracts ten to twelve logging jobs per year to local firms. Furthermore, ASD provides processed lumber to approximately eight architectural firms, ten builders/contractors, two flooring installers, three retail centers, four cabinet makers, and one interior designer.

The Blue Ridge Forest Landowner Cooperative plans on providing skilled labor positions in various areas including environmentally sensitive harvesting, milling, drying and value addition services, whether they are hired directly or contracted. Whenever possible they plan for making capital purchases and selling products locally. Other local employment will be generated by maintenance of equipment and professional services (i.e. accounting, law, etc.). The BRFC also hopes to, at some point, hire a staff forester or several forestry technicians. Currently BRFC has no full-time employees. Upon reaching minimum capitalization, they will begin their operation with one full-time employee and possibly a part-time office assistant.

CFP impacts the local economy because TNC employs the project director who lives in the region, by contracting out forest management services to local professionals, and by employing local loggers to conduct silvicultural activities. Realizing that environmental capital within and around a community is undeniably linked to the community's social and human capital, TNC originally had community enhancement through capacity building, local economy building, and identity fostering as a large component of the Forest Bank™. They originally planned to process raw forest material locally, and still hope to do so, but that is no longer a top priority.

Grayson LandCare hopes to enhance the local economy through value-added processing, but currently has nothing in operation. Much of their energy is currently directed to establishing a local processing facility for grass-grazed beef that will be sold local through a regional grocery store, Food City.

The MWC currently employs an office manager and executive director. It provides work for six to seven consulting foresters, an unknown number of loggers, two saw mill owners, and professional service providers such as lawyers, accountants, etc.

The MWC, in addition, provides processed timber products to local business partners working in the wood manufacturing business and building and construction.

Forest Literacy

Forest owners, neighbors, community members and leaders can learn about forests, the ecosystem services they provide, and the role of proper forest management. Presumably this increased understanding will translate into increased appreciation for forests, increased efforts to sustain forest goods and services, an increased practice of sustainable management, and intolerance for unsustainable management.

All the cooperatives studied here, in particular the BRFC, are targeting forest owners who might not otherwise obtain professional forestry advice or know how to access information about forest management. The BRFC actively engages potential members, potential service providers, and the general public with informational meetings, seminars, workshops, and field days. These outreach efforts cover topics such as forest management and planning, forest measurement, low-impact harvesting, and drying and processing. An informant with the BRFC had this to say about his experience with the BRFC:

“Before this I didn’t know what a slippery elm looked like. I’ve always been fascinated by plants but my background is in humanities. I grew up on a farm but I never really had the biology of it all. Just the beauty has inspired me to learn more and then to see the problems and then to try to fix them if possible....another benefit of certification was our own education.”

Appalachian Sustainable Development is also very active increasing community awareness of forest and forestry issues. The director regularly publishes news columns about forestry and attempts to increase community awareness by partnering with local celebrities and businesses. In addition, ASD landowners are encouraged to work actively with their contracted forester throughout the entire forest planning and management process. An informant from ASD had this to say:

“They are part of the process. They are part of figuring out what to do I think by the end of the process they understand considerably more about what they have and how to manage it.”

Vertical Social Networks

Vertical networks link local communities with public and private resources outside of the region, providing access to information, leadership, loans, materials, and technical assistance (Flora & Flora, 1993; Fischer, 1977). All of the cooperatives help local communities nurture these vertical linkages. ASD works with private foundations, Virginia and Tennessee Cooperative Extension, and with the Virginia Department of Forestry. ASD also has established business relationships with the Charlottesville region by intentionally locating a funded business development and marketing person in that region. The BRFC works with the Virginia Department of Forestry, the local land-grant university (i.e., this study), as well as private land managers, foundations, and non-governmental organizations. The CFP is also vertically linked to the Nature Conservancy for financial, technical, and leadership support. Finally, Grayson LandCare seems to have the most potential for establishing and benefiting from vertical linkages. It is in the process of developing partnerships with the local land-grant university, the local resource conservation and development offices, the state department of forestry, state and national politicians, USA Landcare, Landcare Australia, the Natural Resource Conservation Service, and the United States Department of Agriculture. These vertical linkages have been key to the success of Landcare efforts elsewhere (Wilson, 2004).

Horizontal Social Networks

Horizontal networks are the basic fabric of local community, the social relationships among neighbors, church members, professionals, merchants, friends, and co-workers. These networks provide trusted information, labor, material and emotional support (Flora & Flora, 1993; Fischer, 1977).

Grayson LandCare has extensive horizontal networks to complement its vertical networks. This is encouraging because horizontal, social linkages have been key to the success of Landcare elsewhere (Wilson, 2004). Grayson LandCare is a grassroots effort that emerged to respond to changing environmental, social, and economic conditions. The effort has attracted considerable attention by the local press, getting front page coverage on the local newspaper that has generated interest in neighboring communities.

Several town meetings have attracted a number of people, including local politicians as well as the media. It has its own website (www.publicecology.org/graysonlandcare).

ASD's linkages among forest owners, wood processors, and local merchants provide a growing horizontal network. The ability of the BRFC to reach beyond a few landowners and professionals has thus far been limited. CFP's horizontal networks are limited to a few landowners and professionals, however considerable other horizontal networks exist because of TNC's extensive operations in the region associated with other programs.

As an example of the power of horizontal networks, one local resident and keen observer of regional politics attributes community capacity enhanced by environmental groups such as ASD and TNC as leading to a major land conservation effort. When a private forestry company decided to sell its large landholdings the result was a great deal of local concern about the impact of resulting fragmentation and development on the community and environment.

“The community came together to prevent the sale of the property to developers. The Nature Conservancy was then able to purchase the land, and now it is going to the Virginia Department of Forestry. Every cooperative endeavor (ASD, BRFC, VDOF, etc.) is helpful in reaching a different group.”

Local Government Involvement

County supervisors, zoning boards, land use administrators, and a host of other local government offices can nurture or resist cooperative ventures such as those studied here. Neither ASD nor the BRFC have aggressively explored these relationships and as a result local government officials are largely unaware of their efforts. In contrast, Grayson LandCare has actively solicited the participation of the county government, which seems very interested, especially since the group contends that through its efforts land will become more productive, circulating more money throughout the county, and serve to preserve open space and the rural character of the county—all key objectives of county government. A politically connected informant had this to say:

“LandCare needs to demonstrate the economic benefit that it can potentially provide the county. Grayson County can only ever have a small, entrepreneurial business economy. If LandCare could help us do that, then sign me up”.

Several county officials have specifically expressed interest in learning more and have requested presentations/information. However, the county government does not seem to have a clear understanding as to how to support such an effort. In the case of ASD, Russell County gave ASD use of land free of charge in an industrial park so that the ASD could use for its milling and processing operations.

In at least one case, county officials have expressed concern about these ventures to the extent they might diminish tax revenues. For example, several of Grayson LandCare members have been advocating land-use taxation as one additional solution to slowing land conversion and loss of rural character (farmers and forest owners are taxed at a lower rate than developers). Such a policy would either reduce tax revenues or significantly shift the tax burden in an already economically depressed county where approximately 49 percent of the land is locked up by the state and federal government for preservation purposes from land rich persons to homeowners, lot owners, and businesses. Such a shift might not be politically desirable, and it might have unwanted consequences of depressing housing prices or discouraging businesses from locating in the region. A reduction in tax revenues, all together, might have unwanted consequences such as suffering community services, for example schools, sewers, libraries, etc. A politically connected informant had this to say:

“The county government would not be supportive of such an effort like Grayson LandCare if in any way it locks land up for preservation and impedes the improvement of economic prosperity in the county. What happens with LandCare needs to be congruent with the comprehensive plan of the county.”

Community Identity

A previous study in the region found community identity an important concern of local community and business leaders (Kendra & Hull, 2005). The cooperatives all promote themselves as being consistent with if not promoting their community's character and identity. One technique is to promote organizational and product names that reflect the region (i.e., *Appalachian Sustainable Development*, *Blue Ridge Forest Landowner Cooperative*, *Grassroots Grayson*, *Massachusetts Woodlands Cooperative*). These names specify a place to live, a sense of pride, a sense of place, as well as a sense of identity. An informant from the Blue Ridge Forest Landowner had the following to say about name selection:

“The name is Blue Ridge Forest Landowner Cooperative so we consciously made the decision to define our name in a way that invoked where we were from. Additionally, we define our service region by watersheds...because the people identify with the watershed they live in.”

These names not only help with community identity but they are helpful in niche product marketing. ASD specifically markets and labels its products as locally grown, “Sustainable Woods” in an effort to link the products to the local culture and environment. The other cooperative ventures have less developed markets, but the BRFC does market and label its products as “Appalachian Hardwoods”.

All the cooperative ventures also say they are promoting regional character and identity by sustaining rural lifestyles and landscapes by making forestry and farming more profitable. An informant with the BRFC had this to say:

“By being able to allow rural landowners to continue as rural landowners because they have the economic means to make that happen, it will also strengthen the communities socially”.

Social Diversity and Equity

One indicator of community enhancement and increased community capacity is the existence of networks that include diverse social, ethnic, cultural interests (Flora & Flora, 1993). Diversity is fairly low in all these cooperative ventures, with no evidence of ethnic diversity. This may be a reflection of land ownership demographics in Southern Appalachia. A few informants suggested that socio-economic diversity was low because these ventures initially needed access to capital and thus appeal to people with higher disposable income and less immediate needs for cash flow. In the case of MWC, socio-economic diversity is higher because the cooperative has made membership fees as low as possible and because the cooperative allows potential members to barter for membership. For example, a logger having land who may not be able to afford membership can barter logging services for his or her membership fee.

In the case of BRFC, most interest in the cooperative has come primarily from people falling within the middle to upper-middle class range. However, the board is currently trying to draw the interest of lower income as well as “land rich, cash poor” landowners by seeking the most affordable certification process possible, group certification under FSC’s Small and Low Intensity Managed Forests (SLIMF) guidelines.

They are also looking at grants which are specifically geared towards helping the cooperative address social diversity and equity issues.

Aesthetics

Forest aesthetics has been described as a form of natural capital that enhances community capacity by increasing pride in place and encouraging people to come to a place permanently to live or temporarily to visit (Flora, 1997). Forest aesthetics are enhanced by management actions that produce large, well spaced trees, minimal ground cover, no evidence of mud, disturbance, or trees damaged in the course of harvesting, smaller clearings, and evidence of careful professional management (Hull et al., 2004; Ribe, 2002). All of the cooperative endeavors studied here have aesthetics as an objective. Low impact harvesting techniques will minimize site disturbances. Cooperation with landowners will help manage expectations about the timing, location, and extent of these disturbances, which also improves the perception of aesthetics. The uneven-aged management currently advocated by some of these cooperatives will help sustain a continuous forest canopy with large trees. Clearings for regeneration will be kept small in order to minimize aesthetic impact.

Table 2: Community Enhancement

Community Enhancement†	ASD	BRFC	CFP	GL
-Grow Local Economy	Yes	Yes	Yes	DK
-Forest Literacy	Yes	Yes	Yes	Yes
-Vertical Social Networks	Low	Medium	Medium	High
-Horizontal Social Networks	High	High	High	High
-Local Government Involvement	Low	Low	Medium	Medium
-Community Identity	High	High	Medium	High
-Social Diversity and Equity	No	No	No	N/A
-Aesthetics	Yes	Yes	Yes	N/A

†Table 2 is a graphic representation of where each case study falls with respect to the various dimensions of community enhancement. The descriptors "high" "medium" and "low" are a relative comparison of the case studies showing how well they meet the criteria. Those rated "high" do a better job than those rated "medium", etc.

Create/Control/Enhance Market for Stumpage

Cooperatives can create profit for landowners in areas where prices for stumpage are controlled and depressed by a few large corporate entities that monopolize the market. If a cooperative can control a large volume of timber, then it gains bargaining power with monopolistic buyers (Cook, 1995).

None of the four cooperative ventures studied control or plan to control sufficient forest volume to influence the market in this manner (Table 5). One of our informants argues, based on discussions with small but growing forest companies, that for a cooperative venture to be successful in this regard, it would need to control 20,000 acres and produce a steady annual supply of 1 MBF. The acreage is calculated assuming the managed land's annual allowable cut is 125 bf per acre, per year.

Market Access

Certification may allow access to certain markets (Table 5). That is, all other things being equal (i.e., price, quality, availability), some consumers prefer certified wood (Owari et al., 2006; Jensen et al., 2003; Ozanne & Vlosky, 2003; Kozak et al., 2004). It is less clear if certification increases the price of stumpage. The BRFC is relying on Forest Stewardship Council (FSC) certification to increase sales and value; in particular, the BRFC sees a large international market for FSC certified stumpage. ASD is currently not pursuing third-party certification such as FSC, because they are not sure it is worth the cost. Instead they are self-certifying by holding themselves to standards that equal or exceed FSC. They have successfully built their own brand and marketing program that allows them access to certain markets and adds value. The MWC is FSC certified and promotes certification in the marketing of its products. However, it is not clear how much of MWC's market results from FSC certification and how much results from an active marketing program that successfully sells locally grown, sustainable forest products.

A recent study showed that certification, for Finnish certified forest products suppliers, increased market share, increased customer retention and satisfaction, and increased the company's positive reputation. However, there was still no price premium

being paid for certified products and producing certified products did not improve the companies' financial performance (Owari et al., 2006). The pros and cons of certification for cooperative ventures are discussed throughout the results.

Cooperatives also can create profit for landowners in areas where no stumpage market exists, especially for low-grade material, by creating a harvesting, processing, transportation, marketing and retail infrastructure for sustainably grown, locally produced goods. All four cooperative ventures are attempting this; ASD and BRFC are the farthest along. Details of this effort are discussed below.

Value Added Processing

In addition to adding value to stumpage prices, cooperatives can generate profits at other levels of the supply chain. Transportation, sawing, drying, and other wood processing operations also add value to the local economy (Lang, 1995). More profit can be captured by cooperative members if the value-added operations are conducted by the cooperative venture through a vertical integration of services. However, vertical integration requires greater outlays of start-up costs and greater risk of failure because if one operation fails, the whole production chain may suffer.

All four of the cooperative ventures have explored this approach to increasing member profits (Table 5). ASD and BRFC (and MWC) add value by (1) gathering, sorting and marketing logs according to grade and species, (2) processing selected logs into value-added products (e.g., flooring, trim, ceiling panels, cabinetry, timber frames, etc.), (3) product labeling, and (4) retailing to local markets. Of the local cooperatives studied, ASD is furthest along. It is too early to tell for Grayson LandCare, and CFP no longer considers local value-added industry a primary goal of its operation.

A large part of ASD's start-up phase was centered on accessing land for a lumber yard and small milling operation, building a kiln for drying, building a covered but open building for all weather sawing, and building a storage warehouse which includes office space for the mill manager. They also worked hard developing niche markets locally (i.e. character, certified sustainable, local, etc.), soliciting landowner participation for a supply of raw materials, and finding skilled labor and professional services.

“We have the log trucks leaving the area [with materials processed elsewhere]...obviously that stresses the ecosystem because if you don't have a lot

of value in every ton that you remove than you have to remove a lot of tons. You need to be able to add value to your resources...Saw mills are pretty much closed [locally]...We felt that the initial, our entry into it needed to be creating the capacity of local woodworking companies to be able to use local wood to the maximum value.”

ASD’s system is simple but not without its inefficiencies. ASD contracts with a logger. The logger then brings the raw forest product to ASD’s mill in Castle Wood, Virginia. From there, the mill manager sorts and grades the logs. The logs are then milled into boards by ASD’s contracted sawyer who is paid by the board foot. The boards are then both air and kiln dried, transported to a mill works company for further processing into finished products, and then picked up and delivered to ASD’s client. Several informants admit that having to transport the roughly milled boards for further processing and then deliver them to clients is inefficient and more costly.

The BRFC will have much of the same value-added system as does ASD. The only difference is that the roughly sawn boards will not have to be transported for further processing. The BRFC will have access to planers that will enable them to make a finished product on site. While this may be more efficient than ASD’s system, ASD contracts with an established mill works business. Doing so has the potential benefits of better quality control (i.e., all of the established millwork’s capital is aimed solely at one step in the forest products supply chain--generating a finished wood product by turning boards into flooring, trim, cabinetry, etc.; whereas the co-op’s capital has to be spread such that it can generate a variety of products and services-- forest management advice, initial processing, drying, storing, reprocessing into an end product, etc.) and minimizing the risk of vertical integration (i.e., the miller can solicit and process timber from other vendors).

Developing Markets and Product Differentiation

ASD has invested a great deal of effort in niche market development. They have hired a full-time marketing specialist to promote a market for locally grown, sustainable hardwoods in nearby urban area with a large university, high-end socio-demographics, and the driving force behind one of the fastest growing areas in the US (Charlottesville, Virginia). They are looking at new markets in other wealthy urbanizing areas where

environmental issues are more likely to sell. They also are promoting opportunities to sell to high-profile public buildings such as the local library because these ventures are often willing to pay a premium for local grown materials and because the building becomes an advertisement for future sales.

“We’re just finishing up the Bristol public library which was not a LEEDs thing but was a beautiful expansion and renovation of the existing library in a downtown location which was part of a general downtown revitalization and they’ve got 4,000 square feet of our hickory. It’s going to open in another month and it’s just stunning. It’s going to be a great education and outreach marketing opportunity. The same could be said if there is a new science wing at a university.”

This type of marketing requires special skills and resources. ASD has secured a foundation grant to support its marketing program. Interviews with local mills, cabinet makers, furniture makers, builders, and architects all see a market for the products coming out of these endeavors, character grade, local, and sustainably managed wood products. They also report that this market is not necessarily high-end. Customers are primarily middle-income but also high-income.

The success of the MWC is also largely dependent on its marketing ability. It has worked hard to place its products with local woodworkers and to sell lumber to local universities that have high environmental standards and purchasing protocol that privilege local grown, sustainable products. ASD and MWC both have fairly comprehensive websites with very detailed service and product information. Both hold field days and workshops as well as make use of techniques such as direct response advertising. MWC’s access to markets for “value-added, local, sustainably grown, character” products has been facilitated by similar efforts that previously existed in the region. Prior to MWC’s inception, there was a fairly large marketing campaign labeled “Be a Local Hero” initiated in 1999 by an organization called Community Involved in Sustaining Agriculture (CISA) for value-added, local, sustainably grown, organic produce and other food products. This campaign, which promotes the purchase of locally grown agricultural products, has increased the sales of such products as well as contributed to economic growth in the region. As a result, MWC was able to quickly identify and garner the support of local business partners as well as potential members of the coop. They cultivated this relationship by setting up a group Chain of Custody

certification program for interested business partners. ASD had to specifically allocate more time and more financial resources to market development.

The BRFC has done less to develop local markets. They plan to rely on direct marketing of FSC products internationally because their market research shows international markets providing the best profit margins and they worry about the local market for local/certified goods becoming saturated. A key informant from the BRFC had this to say:

“It’s really more an issue of profit margin than where the market is. Selling locally constrains you in what you can sell, to whom, and in how vibrant that market really is”.

The CFP has also done relatively little to develop local markets, in large part because local economic development is no longer a primary goal of this TNC program. They are, however, trying to direct their raw products to local mills, but they will sell elsewhere. Pulp, for example, will leave the region completely. Because CFP is proximate to ASD and supportive of ASD’s goals, CFP and ASD have engaged in informal discussions about using some of CFP’s timber to supply ASD’s processing division, as feasible and when convenient.

Reliable Supply of Timber

Generating a steady supply of raw and processed materials is challenging. Because these cooperative endeavors emphasize ecological and amenity concerns, they often harvest low-value material first, minimize disturbance, and leave valuable timber standing. Therefore it is difficult to predict what will be coming into the mill at any given time. If the mill has orders for poplar, and the harvest site has only sourwood and hickory, filling orders becomes difficult. Compounding this issue is the cooperatives’ commitment to generate cash flow for the landowner-members and maximize amenities by minimizing time harvesting equipment is on landowner property. Leaving one site to harvest another in order to feed the mill can potentially create relationship problems between the cooperative and the landowner. On the other hand, relationships with end-product consumers may be sacrificed if the cooperative endeavor can not fill orders in a

timely manner. The pressure to fill orders can lead to high-grading, pressures the cooperatives promise to resist.

To reduce the likelihood of high-grading, ASD intentionally keeps the forester who is planning the timber sales uninformed of their marketing specialist's activities as well as orders placed with the mill. They do this so that the forester prescribes the most ecologically appropriate treatment rather than the most economically profitable. A long term solution to the problem of supply advocated by BRFC and ASD is to amass a large acreage in member holdings and detailed inventory of standing timber. This arrangement would allow the cooperative to more easily match supply and demand, maximizing profit without sacrificing ecological or amenity qualities. MWC has made this a priority, recruiting heavily and using a significant portion of their USDA grant to develop a comprehensive database that would contain a detailed inventory of standing timber, harvest schedules, inventory of products on hand, etc.

ASD has explicitly wrestled with problems caused by not having a steady supply of product. It nurtures relationships with end-product consumers by explaining its supply issues in advance. Customers sometimes must be turned away for lack of product (a cardinal sin of retailing because customers may not return). ASD reports that their customers are appreciative and understanding of this situation and return to ASD even if they have been turned away in the past.

Start up Costs and Cash Flow

New businesses commonly need start-up capital to build markets, purchase equipment, coordinate landowners, etc (Table 5). It is not uncommon for new businesses to have cash flow problems. Most businesses access capital via bank loans or from investors; however, it is difficult for cooperative forestry endeavors to access these traditional sources of capital because cooperative forestry businesses have a history of failure (Anderson, 2003). ASD and CFP rely extensively on grants from private foundations. MWC also relies on grants from state and federal institutions. The BRFC is attempting to minimize reliance of subsidies, but still has used these subsidies at critical times (see below).

Informants from all of the endeavors identified the long time horizon of forestry as an obstacle to cash flow. It takes considerable effort and time to plan, manage, harvest, process, and sell sustainable forest products. In contrast to other agricultural products, forest crops take decades and sometimes generations to mature. Moreover, poor past management has depleted the economic value and productivity of many sites through high grading and erosion. It takes time for good management to restore healthy and productive forests, especially if regeneration of shade intolerant species is required.

ASD notes that it takes approximately four months to harvest, process and sell the finished product. During those four months ASD has a negative cash flow needed to purchase the standing timber, pay for harvesting, transport, processing and marketing. Cash flow becomes a problem because ASD does not have sufficient financial resources to purchase much additional raw timber until it has sold finished products. ASD is addressing this issue by obtaining a \$60,000 low-interest loan to allow them to purchase more standing timber and to add a second kiln for greater drying and storage capacity. This second kiln is of conventional design, powered by fossil fuels, and capable of faster drying than a solar-powered kiln. In essence, ASD chose to trade more environmentally friendly processing capabilities (i.e., using only solar kilns) in an effort to increase rate of return, getting raw materials through the system faster.

“Cash flow is the next obstacle. It’s getting better, but it’s always a challenge...from then [harvest] to the time we have liquidity is at least four months and is more like six months because you have sawing time, air drying time, kiln drying time, taking a specific order, manufacturing, and the sell itself. It’s quite a lengthy turn around.”

“I think farmer’s cooperatives can turn over revenue every year, have that capital there turn it over and get money and keep people interested but these thirty to forty even eighty year rotations don’t lend themselves to being as successful.”

Subsidies

Cooperative ventures may apply and receive support from federal, state, and local government programs as well as foundations looking for market based solutions to economic development and environmental sustainability (Table 5). These funds can be used to defray expenses and entice landowner and service provider participation with greater profits.

Local governments have very few financial resources to offer cooperative efforts. It was suggested by one local official that the local government could possibly offer land or facilities at a nominal or discounted price, much like many counties support new business ventures with incubators and industrial parks. ASD, as mentioned, availed itself of such an opportunity. Federal grants are another possible source of funding. The Massachusetts Woodlands Cooperative received approximately \$555,000 in grant monies; a significant grant was from the USDA through its program to support green product market development. They have also received money from the Doris Duke Foundation, the Tides Foundation, and most recently from the Sustainable Agriculture Research and Education Program (SARE).

ASD has received funding and resources from the Blue Moon Fund, W.K. Kellogg Foundation, Ford Leadership for Changing the World, Wallace Genetic Foundation, and Russell County, Virginia.

TNC's Conservation Forestry Program received start up funding from within TNC and from a large grant from Pew Charitable Trusts. Grayson LandCare has received no direct funding, but it emerged, in part, because of network building by Jerry Moles, whose salary was partially funded by the New River Valley Land Trust and a grant from the Fish and Wildlife Service.

BRFC has intentionally resisted relying on grants in an effort to demonstrate that market based cooperative ventures can succeed and to keep the operation functioning only within the realm of economic feasibility. However, it has received professional services in excess of \$100,000 from the Southern States Cooperative Foundation and several small grants from the Community Forestry Resource Center as well as the Appalachian Forest Resource Center.

On balance, it appears that the two most developed cooperative ventures studied (ASD and MWC) required substantial funding to seed the venture, prime the pump for these market-based efforts to succeed. Table 3 is a brief description of the grants, their source, conditions, and amount.

Landowner Cash Flow

For the Conservation Forest Program, the exact payment schedule depends on a number of factors, but, for example, if a landowner enrolled 1000 acres with timber valued at \$100,000 and TNC was paying an annuity equal to 2 percent, they would receive an annual payment of \$2000.00. The payment would be re-calculated at 10-year intervals or after a harvest and can never decrease. The Conservation Forestry Program can also provide tax advantages associated with conservation easements. These tax reductions are most advantageous to people with large tax burdens, but some can be sold by landowners with lower tax liabilities.

LandCare holds out the promise of landowners realizing increased profits from rotational grazing, timber stand improvement, deluxe private camping, and other management techniques, but the venture is too new to have affected profits from forest management.

ASD's processing operation that enables profitable extraction of lower grade timber because of value-added processing provides some additional cash flow to participating landowners. As discussed above, ASD pays landowners a 20-50 percent premium on lower grade materials that otherwise might not be affordably harvested.

The BRFC is more about providing an affordable service than maximizing land owner cash flow. The service would increase forest health and amenity values, which may translate to higher property values and longer forest tenure.

Table 3: Major Cooperative Funding

Grant Source	Grant Description, Conditions, Amount
Sustainable Agriculture Research and Education Program	The Sustainable Agriculture Research and Education Program (SARE) is a part of the USDA’s Cooperative State Research, Education, and Extension Service. SARE helps advance farming systems that are profitable, environmentally sound, and good for communities. Massachusetts Woodlands Cooperative was awarded a \$112,625 grant to support an increase in the use of sustainable forestry by agricultural farmers who have woodlots. (www.sare.org).
Southern States Cooperative Foundation	The SSCF is a public, charitable foundation which provides technical support and assistance to farmers throughout the southeastern US in their efforts to establish value-added agricultural and forestry enterprises. The BRFC has received approximately \$100,000 worth of professional services (i.e., accounting, legal, etc.) needed for their start up from the SSCF. (www.sscfoundation.org).
Tides Foundation	The Tides Foundation is a public charity offering individuals and institutions a vehicle for their philanthropy. It facilitates partnerships between individuals and institutional donors through donor advised funds. The grant awarded to MWC through this partnership was approximately \$9,000 and was to help them develop and pay for a group chain of custody certification (www.tidesfoundation.org).
Doris Duke Charitable Foundation	The mission of the DDCF is to preserve wildlife, both flora and fauna, in the US by accelerating the conservation of essential habitats. The grant received by FSC’s US Working Group was for \$800,000 over three years to increase acreage of certified forest in the US, particularly among small landowners, to build the communications and public information capacity of FSC US, and to develop markets for certified wood. \$5,000 was awarded to MWC to aid them in development of a group certification scheme. (www.ddcf.org).
Community Forestry Resource Center	The Community Forestry Resource Center was established by the Institute for Agriculture and Trade Policy. It promotes responsible forest management by encouraging the long-term health and prosperity of small, privately-owned woodlots, their owners, and their communities. The CRFC has provided technical assistance along with a \$1,000 grant to the BRFC. (www.forestrycenter.org).
Appalachian Forest Resource Center	Appalachian Forest Resource Center is a non-profit working to address the needs of communities in Southern and Central Appalachia by fostering and supporting community forestry activities. The BRFC received a \$10,000 grant for workshops and a feasibility study and a \$5,000 grant for the development of a group certification scheme (www.appalachianforest.org).
Pew Charitable Trusts	The Pew Charitable Trusts serves the public interest by providing information, advancing policy solutions and supporting civic life. The grant received by TNC for the Forest Bank from the Pew Charitable Trust was a part of a \$400,000 grant over two years awarded to TNC’s Center for Compatible Economic Development (CCED) to develop community-based programs for sustainable rural development. \$160,000 was used by the Forest Bank program for preliminary analysis and planning prior to program start up. (www.pewtrusts.com).
USDA Value-Added Product Market Development Grant	This is a working capital grant to help an endeavor in its efforts to build green product markets. \$499,253 was awarded to the MWC to help them expand niche markets that focus on Forest Stewardship, green certified products, and other value-added forest products. (www.rurdev.usda.gov/rbs/coops/vadg.htm).
W.K. Kellogg Foundation	The mission of the W.K. Kellogg Foundation is to help people help themselves through the practical application of knowledge and resources to improve their quality of life and that of future generations. The foundation focuses on building the capacity of individuals, communities, and institutions. (www.wkkf.org).
Ford Foundation	The Ford Foundation is a resource for innovative people and institutions with the goals of strengthening democratic values, reducing poverty and injustice, promoting international cooperation, and advancing human achievement. ASD received the Ford Leadership for Changing the World grant totaled at (www.fordfound.org).
Blue Moon Fund	The Blue Moon Fund promotes new economic and culture approaches to reducing resource pressure and preserving biodiversity. The fund seeks economically sustainable development models that do not displace humans and that take advantage of market forces. ASD was awarded several grants as well as access to a low-interest loan fund to expand and attract investment in their two sustainable enterprises (Sustainable Woods™ and Appalachian Harvest™). (www.bluemoonfund.org).
National Fish and Wildlife Foundation	The National Fish and Wildlife Foundation conserves healthy populations of fish, wildlife and plants, on land and in the sea, through creative and respectful partnerships, sustainable solutions, and better education. The foundation awards matching grants to projects conservation education, habitat protection and restoration, and natural resource management. The New River Land Trust was awarded a \$50,000 grant to help lead a multidisciplinary/multi-agency effort to improve the incomes of landholders in the New River Watershed through the use of conservation easements, rotational grazing, sustainable forest management, and “farm tourism”. Jerry Moles of Grayson LandCare was hired to help lead and implement the program called the “New River Basin (VA) Working Farms Conservation Project”. (www.nfwf.org).

Business Plans

Each cooperative endeavor, except for Grayson LandCare which at this point is more of a social network, has developed a comprehensive business plan (Table 5). Each business plan includes a feasibility study statement of objectives, participant or membership obligations, management and operations information as well as information regarding target markets, marketing strategies, landowner or participant recruitment, financial and manufactured capital requirements, cash flow projections, product information, etc.

Economies of Scale for Services

Cooperatives can be more cost efficient than individual landowners working independently (Table 5). They offer landowner education, development of management plans, accounting, legal, and other professional services that would otherwise cost landowners more if purchased separately or independently of the cooperative. For example, by being a member of MWC, a landowner can have their forest FSC certified for \$250 plus an annual fee of \$80 with or without harvest activity, regardless of acreage. Once BRFC is certified, the landowner will be able to certify their land for \$650 plus an annual fee of \$100. This is in stark contrast to the discounted price of \$640 for initial certification and \$640 for over-site services during a harvest year and \$64 for a non-harvest year being offered to the BRFC by a local certified resource manager. Another example is the group chain of custody certification scheme developed by MWC for the cooperative itself and its business partners. This scheme allows members of the group to share initial as well as annual certification costs placing less of a financial burden on individuals.

In addition, timber stand improvement, prescribed fire, herbicide application, and other forest management activities conducted over larger contiguous areas formed by cooperative members can reduce costs and save forest owners money. Finally, scheduling harvesting operations on several nearby small tracks of land reduces the high costs of equipment transportation that often makes harvesting smaller forest stands less profitable.

Enhanced Forest Productivity (Natural Capital)

These endeavors argue that their “restorative forestry” silviculture increases the value of standing timber by removing the worst trees and releasing healthy trees to grow bigger and taller. These healthy, released trees may grow at rates exceeding rates of return from other investments. This increased capital value in standing trees and the steady stream of income enhances the natural capital of the landowner and the region.

The challenge is to undo years of high-grading, which has left the Southern Appalachia forests stocked with relatively low-value tree species of poor genetic quality. All of the cooperative endeavors seek to do this by a mix of uneven-aged silviculture and worst-first harvesting. It is still relatively early to tell whether or not these cooperative endeavors are in fact achieving enhanced forest productivity. Studies do show that uneven-aged management regimes in mesic soils can increase the value of standing timber because the trees being released add volume and improve in quality; additionally, these same studies show that the mean periodic annual increment (PAI) can be sustained over a relatively long period of time (Schuler, 2004; Schuler & Gillespie, 2000; Nyland, 1996).

Costs to Members

Cooperative ventures have administrative, labor, and capital costs, some of these costs are passed directly to the cooperative member. Other costs can include foregone opportunities to sell forest products independently of cooperative timing and control. The cooperative ventures studied here vary in their costs to members (Tables 4 & 5).

For the BRFC, membership stock is currently set at \$500, certification costs are unknown but potentially fairly pricey (\$640 for certification in addition to \$640 for over-site services) at least until the cooperative itself is certified. MWC has circumvented this issue all together by securing a large grant from the USDA. Because of this grant they are able to keep membership and certification fees at a minimum and are able to pay stumpage. Members pay \$250 for entry into the cooperative and approximately \$80 annually for dues. If landowners decide to leave the cooperative, they are guaranteed at

least 80% of their initial membership fee back. There is no cost for landowners interested in working with ASD unless they do not decide to sell their stumpage to ASD's mill. If landowners decide not to sell their wood to ASD after they have had a management plan developed using ASD's contracted forester, they are charged \$10 per acre for the ASD prepared management plan.

Table 4: Costs to Members

	ASD	BRFC	CFP	GL	MWC
Initial Membership Fees	None	\$500 for purchase of common stock	None	Unknown	\$250
Initial Certification Fees	N/A	Before coop is certified-- \$640 for initial certification \$640 oversight services during harvest After coop is certified— \$150 for initial certification	None	Unknown	None
Annual Certification Fees	None	Before coop is certified-- \$64 After coop is certified-- \$100	None	Unknown	\$80
Management Plan Fees	\$10 per acre if landowner decides not to sell to ASD	Going rate for a professional forester	None	Unknown	Going rate for professional forester

Emphasizing Vertical Integration

Vertical integration is important for cooperative endeavors for two primary reasons: 1) it allows the cooperative endeavor to provide the various services demanded by its members, services like low-impact harvesting and low-impact processing that may be hard to access or unaffordable otherwise, and 2) the cooperative endeavor needs to be vertically integrated to a point such that it can realize the value associated with holding on to forest products farther along in the forest products supply chain. A disadvantage of vertical integration is the additional capitalization needed to support the human (i.e., training, insurance, competitive salaries, etc.), technological and manufactured (i.e., a comprehensive database containing information about products, sales, inventory, supplies, etc., GIS and GPS equipment, harvesting equipment, processing equipment, storage space, trucks for raw and finished product transport, etc.) capacity necessary to run such a business efficiently and effectively. Some of the cooperative ventures studies here are vertically integrated; some are not (Table 5).

For the BRFC and ASD, two cooperative endeavors that are essentially taking on all the steps in the forest products supply chain, vertical integration is what makes their start-up capital needs so high, both having estimated their capital needs at approximately a half million dollars.

For the CFP and HFHC (a purely marketing cooperative), capital needs are much less because they do not need the infrastructure to support numerous steps in the forest products supply chain.

Table 5: Economic Profitability and Feasibility

Economic Profitability and Feasibility†	ASD	BRFC	CFP	GL
-Create/Control/Enhance Market for Stumpage	No	DK	No	DK
-Market Access	Yes	Yes	Yes	DK
-Value Added Processing	Yes	Yes	No	DK
-Developing Markets and Product Differentiation	Yes	Neutral	No	DK
-Reliable Supply of Timber	Yes	DK	Yes	DK
-Start Up Costs	High	High	High	DK
-Use of Subsidies	High	Medium	High	High
-Providing Landowner Cash Flow	Yes	DK	Yes	DK
-Business Plans	Yes	Yes	Yes	Yes
-Economies of Scale for Services	Yes	DK	Yes	DK
-Enhanced Forest Productivity	DK	DK	DK	DK
-Costs to Members	Low	High	Low	N/A
-Emphasizing Vertical Integration	Yes	Yes	No	DK

†Table 5 is a graphic representation of where each case study falls with respect to the various dimensions of economic profitability and feasibility. The descriptors "high" "medium" and "low" are a relative comparison of the case studies showing how well they meet the criteria. Those rated "high" do a better job than those rated "medium", etc.

Social Feasibility

Support from Professional Forestry Community and Service Providers

Loggers are driven, based on high equipment and transportation costs, to favor bigger tracts yielding large amounts of volume and higher valued species. For similar reasons professional foresters prefer large sales. They are often paid a percent of the sales price, so the more money exchanged in a sale, the more money the forester makes. As a result of this fee structure, it can be difficult to find service providers willing to

engage in harvesting activities on sites that offer lower yield and lower valued species (Table 6). Cooperative endeavors can overcome this barrier by finding ways to pay service providers a premium for their services.

“They [production loggers] are looking for tracks that they can really make money on. They will not be interested in tracks of where they have to take extra care and that provide less volume.”

ASD has been able to provide loggers and landowners a premium and has had no problem finding willing service providers. ASD, also, provides loggers, foresters, and other service providers such as local wood manufacturers with access to skills and information by one-on-one contact, providing them with work, and by hosting educational and technical skill building workshops and field days.

There is debate within the forestry profession about the environmental and economic benefits of uneven-aged silviculture (Aust & Blinn, 2004; Yoho, 1980; Hood et al., 2002; Jackson et al., 2005). Notably, professional opinion obtained during interviews with key professional foresters seems to echo what the literature suggests. For example:

“Some of the problems I think I’ve seen with some of these forestry cooperatives is that it’s not necessarily run by people with a strong forestry background and so they often set their silvicultural practices according to opinion...what they believe it should be and so often you get a real inverse or a hundred and eighty degree turn around of what we should be doing with what they actually carry out.”

However, some forestry professionals see cooperatives endeavors as an opportunity for them personally as well as their profession. That is the cooperatives are offer professional forestry the chance to practice long-term, good forest management, to improve society’s overall view of the forestry profession, and to access niche markets in planning, management, processing, and production. For example:

“Better forest management and less high-grading...this is occurring because these programs are actively working with landowners who are interested in long-term forest management and value. Consultants, when they are given the opportunity, like with Appalachian Sustainable Development and the Blue Ridge Forest Landowner Cooperative, employ good management techniques”.

“They [professional land managers] can actually engage in the forest management and silvicultural techniques they learned in school. They can gain more respect from the community because they are no longer just timber buyers and inventory specialists.”

“These endeavors might be beneficial to family-owned mills and certified mills because they are increasing the market”.

Support from State Natural Resource Programs

State resource management agencies seem neutral or mildly positive about these cooperative endeavors (Table 6). Cooperatives may help state agencies get good management advice to landowners who otherwise would not get it because of decreasing state budgets or because the landowners seek different sources of information. There also seems to be recognition on the part of state agencies of the paradigm shift in natural resource management described in the introduction and literature review, that being a shift from regulatory, top down approaches to more community-based, bottom up approaches (Baker & Kusel, 2003). For example, a project manager and forester with the Virginia Department of Forestry had this to say:

“I think the agency is changing to be more accepting of these kinds of community leadership things. I think in the past, in general, if you were to approach a 1970’s Department of Forestry person and say hey we’ve got this community-based thing going on teaching about natural resources he would have said where’s the sound science, who’s really going to teach them? I think now a days that has changed. I think we know we have to rely on other groups and individuals to show that leadership and show that right ways because we can’t get around to it all with 300,000+ landowners [in the state of Virginia]. This kind of effort is certainly valid and appropriate.”

Landowner Concerns: Lost Property Rights, Flexibility, and Financial Risk and Commitment

Potential coop members are concerned about risk, cost, and liquidity (Table 6). Endeavors that have very little risk financially, require minimal commitment, and maximize liquidity seem to be doing better recruiting members

With MWC, for example, the only risk to the landowner is the possibility of losing twenty percent of their \$250 membership stock. It has approximately forty-five members and is growing with relative ease. Landowners, upon joining MWC, assume no risk of debt because of MWC’s approximately \$555,000 in grant monies to fund their start-up operations.

ASD, a case where the only risk to the landowner is having to pay \$10 per acre for a forest management plan if the landowner chooses not to sell their timber to ASD,

services about ten to twelve landowners a year and has had very little problems, if any, finding participants.

The BRFC, although currently not soliciting members, potentially faces a problem with obtaining buy in and support from potential members. Members can sell their \$500 membership stock back to the cooperative if they decide to leave; however, the cooperative has discussed (but never implemented) taking out loans based on the standing value of the cooperative's timber. If for example the cooperative were to fail down the road and the money was not available to pay off debts, the landowners could potentially risk losing their standing timber in order to make those payments.

The literature supports this finding (Sample, 1994; Brunson et al., 1996; Williams & Ellefson, 1997). Endeavors requiring a fairly large commitment or investment tend to have a harder time recruiting members. In addition, the same is true for endeavors requiring the giving up of a fairly large amount of control. The Conservation Forestry Program, where participants must agree to give up their timber rights in perpetuity and forgo any liquidity, faces this particular challenge and thus has a lengthy and often difficult time enrolling participants. One potential member had this to say with respect to the Conservation Forestry Program:

“There is a fairly lengthy time necessary in building a relationship enough to where they trust The Nature Conservancy enough to enroll in the program because it's permanent. That has been one of the main challenges in pitching this program. People don't like the idea of giving something up forever.”

“We could be serviced with sustainable forestry through the Conservation Forestry Program. I think it's a great program especially for extremely large tracts of land or absentee landowners, but for my wife and I, we are there, and we don't want to give up that control of managing our timber. So for us, the model didn't work. I'm glad it's there. It's very vital to other landowners”.

Members required to commit some time and resources as well as give up a certain amount of control (i.e. forgo liquidity, the cooperative has first right of refusal with regards to their timber and management plans must follow FSC guidelines). However, they can work with their own forester, manage their forest according to their own objectives, leave the cooperative at any time, and sell their timber to the highest bidder.

Commitment, investment, and giving up control are probably lowest with ASD. Landowners receive a free management plan if they decide to sell to ASD and pay a

small fee if not. They do not have to join a group or invest any time or energy to ASD above and beyond working with an ASD contracted forester to create a management plan and again finding participants is not difficult.

MACED has attempted to address the issue of forgone liquidity in exchange for good forest management by realizing that many landowners, especially low to moderate income landowners, have competing needs for cash and often have short-term cash needs. So, they have created the “Forest Opportunities Initiative” which provides landowners with access to cash through a loan, allowing them to delay a potential harvest for needed cash. Participants are required to repay their loans over a fixed time horizon.

Leadership

Effective leadership is important to a cooperative effort because it will encourage members to join, remain committed, and discourage member descent. All of the case studies have effective leadership (Table 6). Anthony Flacavento for ASD, Harry Groot for BRFC, Bill Kittrell for the CFP, and Jerry Moles for GL are all proven leaders, catalysts, and “pump primers” with the experience, education, and desire to see these programs/businesses succeed. All are also easily able to cross boundaries, opening and in some cases creating necessary networks. All also contribute to the degree of horizontal and vertical connectedness each cooperative effort displays.

Table 6: Social Feasibility and Other Factors

Social Feasibility and Other Factors†	ASD	BRFC	CFP	GL
-Support from Professional Forestry and Service Providers	Medium	Low	Medium	DK
-Support from State Natural Resource Programs	Low	Low	Low	Medium
-Landowner Concerns	Low	High	High	Low
-Leadership	High	High	High	High

†Table 6 is a graphic representation of where each case study falls with respect to the various dimensions of social feasibility and other factors. The descriptors "high" "medium" and "low" are a relative comparison of the case studies showing how well they meet the criteria. Those rated "high" do a better job than those rated "medium", etc.

Summary of Case Studies with Respect to the Criteria

In review, if asked to point out the most successful case based on how well it meets the criteria, Appalachian Sustainable Development would probably be considered

the most successful. Appalachian Sustainable Development is successful in terms of social feasibility (Table 6), community enhancement (Table 2), and economic feasibility (Table 5). ASD contributes to the local economy by providing jobs, products, and services locally. ASD also supports the region's cultural identity as well as helps to build local capacity. While currently not economically self-sustaining, ASD is working to build necessary infrastructure, to capitalize enough such that it can one day become self-sustaining, to grow markets that capture a premium, and to create financial incentives to attract service providers that may not be attracted otherwise. Additionally, while it is somewhat early to tell what ecological outcomes will come from ASD's efforts, it can be stated that ASD has been successful at creating policies and standards and engaging in management activities that address environmental quality management (Table 1).

While the Blue Ridge Forest Cooperative has the potential to be successful with respect to all the criteria, it has faced several challenges. Although in the process of obtaining FSC certification, which will ensure that land managed by the cooperative meets or exceeds Best Management Practices, BRFC, like ASD, is choosing primarily to engage in uneven-aged silviculture, the ecological and economic outcomes of which are hotly debated. BRFC will likely contribute to a local economy if it becomes a successful business (Table 2). However, BRFC is minimally capitalized because of unexplored opportunities and a lack of interest from potential participants and investors. BRFC is also unclear as to how it will attract service providers willing to engage in ecologically enhancing activities (Table 5 & 6). BRFC supports the local cultural identity as well as increases community capacity (Table 2).

The Conservation Forestry Program is successful in terms of ecological sustainability and economic feasibility. Because the CFP is a venture within The Nature Conservancy, it has access to internal funding mechanisms that will keep it running even if the program itself does not make money in a given year. Additionally, the CFP has secured and is managing according to FSC standards approximately 20,000 acres of critical watershed in the Clinch Valley. The Conservation Forestry Program is community enhancing in that it ensures green space, aesthetics, and working forests. However, it has largely abandoned due to limited funds, interest in ensuring local flow of products and money and other community capacity building projects. Furthermore, the

Conservation Program has struggled with social feasibility in that it remains difficult to get landowners to enter into permanent easements (Table 6).

Grayson LandCare is still in its formative stages. Thus, it is difficult to tell whether or not the venture will be successful in terms of ecological enhancement and economic feasibility. It is clear, however, the venture is supportive of ecologically enhancing policies and strategies as well as strategies and policies that make ecological enhancement economically feasible. It is also clear that thus far Grayson LandCare has been extremely successful in terms of social feasibility and community enhancement. Grayson LandCare has a well educated, motivated leader dedicated to empowering the local community and its individuals to be able to define and solve natural resource issues. Grayson LandCare's horizontal and vertical networks.

Chapter Seven: Key Challenges and Keys to Success

9 Key Challenges

The cooperative forestry endeavors examined in this analysis, although somewhat successful, continue to face many challenges. Not surprisingly, many of these challenges are the same faced by previous cooperative efforts (Nadeau et al., 2002; Gaskill, 2003; Dempsey, 1968). In short, cooperative forestry endeavors continue to have trouble organizing themselves such that they are both socially acceptable and economically feasible. In addition, this study revealed cooperative forestry efforts face new challenges not previously explored. They face the challenge of balancing sometimes competing ecologic, economic, and amenity objectives. The following are nine key challenges faced by cooperative forestry efforts.

1. Control and Flexibility

The results of this study along with the literature suggest that fear of losing control and flexibility is a major barrier to participation in cooperative forest ventures (Brunson et al., 1996; Williams & Ellefson, 1997). The cooperative must balance its need to control forest management with the desires of landowners to maximize control and flexibility. A range of options exist, they include locking members into a contract that gives the co-op all management decisions for all time (i.e., an easement) as is the case with the Conservation Forestry Program, allowing the members to chose their own forester, having veto authority over timing and design of management operations as is the case with the Massachusetts Woodlands Cooperative.

2. Landowner Commitment

The results of this study suggest the greater financial commitment required for an endeavor, the harder it is to find participants. Again, a wide range of opportunities exist, from permanently loosing resale value as is the case with the Conservation Forestry Program, to paying for expensive management plans and certification as is the case with the Massachusetts Woodlands Cooperative, MACED, the Conservation Forestry Program and Appalachian Sustainable

Development, to paying a nominal fee only if deciding not to sell stumpage to the co-op as is the case with Appalachian Sustainable Development.

3. Vertical Integration

The results of this study support the literature in that vertically integrated businesses typically require more capitalization to support human, technological, and equipment capabilities (Anderson, 2003). In the case of Appalachian Sustainable Development as well as the Blue Ridge Forest Landowner Cooperative, both vertically integrated ventures, capitalization has been both slow and difficult. Vertically integrated business also can be rigid, potentially creating more points for failure (Anderson, 2003). If any part of the vertically integrated system fails, then the whole vertically integrated system risks failure or set back. Tight vertical integration also risks environmental qualities. Pressures from the processing and marketing branches of the co-op can drive management and harvesting decisions (i.e., harvesting on wet soils to “feed the mill” and high grading to meet an order for a particular grade/species).

4. Marketing

Not unlike what was found in the literature, the results of this study confirm FSC certification may create access to markets, which provides a critical opportunity to move product and generate cash flow. However, there is little evidence that FSC certified products consistently generate a price differential. Consumers tend to buy “green” only when price, quality, and availability are equal (Owari et al., 2006; Jensen et al., 2003; Ozanne & Vlosky, 2003; Kozak et al., 2004). It is also unclear if there is an international market for certified, low value species of the type cooperatives will initially harvest.

5. Supply

Entering and satisfying the regional market for certified character wood requires an adequate and reliable supply of retail products to meet client needs. The Conservation Forestry Program as well as Appalachian Sustainable Development have expressed concern over supply. The results of this study show that generating a steady supply of raw and processed materials is challenging because these cooperative endeavors emphasize ecological and amenity concerns, and thus

harvests low-value material first, leaving valuable timber standing. Therefore it is difficult to predict what will be coming into the mill at any given time. If the mill has orders for poplar, and the management plans focuses on removing sourwood and hickory, filling orders becomes difficult. Relationships with end-product consumers may be sacrificed if these cooperative endeavors cannot fill orders in a timely manner. The pressure to fill orders can lead to high-grading, pressures cooperative endeavors promise to resist.

6. Regeneration

The results of this study highlight regeneration as a challenge for cooperative forest ventures. This is a challenge not previously identified in the literature. The ecological and economic benefits of uneven-aged silviculture, the silvicultural tool most commonly advocated for and used by the case studies, are fiercely debated among researchers, foresters, environmentalists, other natural resource professionals as well as the public. The absence of fire, large clearings, and other disturbance along with an uneven aged management regime that limits the amount of sunlight reaching the forest floor combine with the browsing effects of white-tailed deer to make it difficult and expensive to regenerate moderately shade-intolerant species such as oaks, hickories, and yellow poplar; species that are often the most economically valuable (Schuler & Gillespie, 2000; Schuler, 2004; Miller et al., 1995).

7. Soil Compaction and Erosion from Uneven-aged Management

Another challenge brought to light by this study is the potential for soil compaction and erosion from the use of uneven-aged management. The frequency of harvests required with uneven-aged management can increase levels of erosion, sedimentation, and soil compaction because this form of silviculture requires repeated entries into the forest (Hood et al., 2002). This re-opens roads, which is the single largest source of erosion on well-designed forestry operations (Yoho, 1980; Hood et. al., 2002).

8. Wildlife and Biodiversity

This study brings to light a challenge for cooperative forest ventures in maintaining biodiversity and adequate habitat for wildlife. A decline in oaks and

acorn production as a result of uneven-aged management and succession reduces a valuable source of food source for wildlife. This possible trend presents a major concern for wildlife, as do invasive forest pathogens, global warming, increasing numbers of shade-tolerant, hard mast producers like beech dominating the understory (Zipperer, 2002; Schuler & Gillespie, 2000).

9. Availability of Service Providers

Loggers, foresters, and other privately contracted resource professionals are profit driven. Thus, they favor bigger tracts yielding large amounts of volume and higher valued species (Jensen & Visser 2004). Fee structures based on percentage of sale price or profit further discourage service providers working small jobs removing low volume of low grade material (Hull et al., 2004). This study supports the literature in that the harvests promoted by co-ops are typically low in value and volume. Thus, finding service providers willing to engage in such work can be difficult.

12 Keys to Success

The analysis of these cooperative forestry endeavors along with the literature revealed successful techniques for overcoming these challenges.

1. Relationship Building

Finding advocates and participants for risky, inflexible programs is not impossible. This study revealed that if a cooperative endeavor has the resources available to cultivate trusting relationships with potential participants, for example with personal contact as in the case of the Conservation Forestry Program as well as workshops and field days as in the case of Blue Ridge Forest Cooperative, they may be able to overcome this barrier with relative ease. Moreover, landowners motivated by environmental concerns and not dependent on forest-derived income, may be less concerned about cost, flexibility, and liquidity (Brunson et al., 1996).

2. Marketing

Successful marketing is critical to the success of cooperative forestry endeavors. Appalachian Sustainable Development's experiences show that cooperative

efforts can be successful by selling products to local woodworkers, local and regional colleges and universities, public institutions, and other clients that ideologically support sustainable forestry. Relationships need to be actively developed with contractors, retailers, and architects in proximate urban settings that can support niche markets for “local” “sustainable” “character” wood. In addition, regional, national, and international markets also exist for certified products. While market conditions rarely remain static, cooperative endeavors can mitigate the effects of changing market conditions by focusing heavily on market research, identifying potential markets, and by growing and developing markets, if necessary. In addition, relationships can be cultivated and nurtured with business partners and end-product consumers by explaining the supply issues in advance. Customers sometimes must be turned away for lack of product (a cardinal sin of retailing because customers may not return), so the customers must be educated in hopes that they will be appreciative and understanding of the situation.

3. Local Product Label

FSC and other certification labels, alone, are not going to allow cooperative endeavors to realize a premium for their products (Owari et al., 2006; Kozak et al., 2004). However, this study revealed that local labels may be an alternative that not only improves product marketability but also allows the cooperative efforts to realize some price differential. Appalachian Sustainable Development has been able to sell their product at a premium by using a local label that differentiates their product by conveying ecological standards, cultural identity, etc.

4. Checks and Balances

This study revealed that cooperative ventures can intentionally insulate forest management and operations from forest products processing and sales in order to prevent the temptations to high grade trees needed to meet market needs or harvest wet soils in order to sustain mill production. Appalachian Sustainable Development has attempted this by making it so that the forester writing management plans and marking harvests does not know what orders have been

placed or product flow through the mill. Another mechanism to protect ecological quality and landowner interests is to mass acreage of forest and create a detailed inventory that allows cooperatives to more easily match supply and demand, maximizing profit without sacrificing ecological or amenity qualities. The Massachusetts Woodlands Cooperative is working on a database that will serve such a function.

5. Increasing Landowner Control and Flexibility

This study revealed that increasing landowner control and flexibility to the greatest extent possible is a potential tool to increase membership. One such way this can be accomplished is evidenced by the Massachusetts Woodlands Cooperative allowing the landowner to have his or her own forester and in turn this forester being allowed to broker timber sales with logging service providers. The cooperative could just insist on having first rights of refusal to timber sales, and then only bid on the lower value timber that other buyers ignore. Higher grade timber could then be sold at the landowner's discretion in a traditional bid sale. If the cooperative cannot add value to the sale by buying and processing the lower grade timber, they withdraw.

6. Reducing Landowner Risk

This study revealed that cooperative endeavors can assume the risk of management plans and certification expenses rather than passing them onto the landowner. They can use profits from value-added processing and grants from foundations and government agencies to reduce or eliminate the costs for landowner participation. One strategy, utilized by Appalachian Sustainable Development, is to develop plans but not charge landowners for these plans as long as landowners sell timber to the cooperative. Another strategy, developed and utilized by MACED, gives landowners low interest loans for initial planning and timber stand improvement operations. Still another, developed and utilized by the Massachusetts Woodlands Cooperative, develops a "group certification" scheme that reduces cost of certification.

7. Increase Flexibility of Vertically Organized Business Plan

Organize the co-op so that it uses and encourages other local businesses to fill roles in the management, harvesting, transportation and processing of fiber. Doing so could share the cost of capitalization, reduce costs of services through competition, and provide redundancy in key functions of the business plan. Unfortunately few such businesses exist in the region studied, so these cooperatives must “prime the pump” with its own success as a way to establish and demonstrate the viability of these business ventures.

8. Adopt Adaptive Management

The jury is out on whether uneven-aged silviculture (especially single-tree selection) will produce the desired economic and ecological conditions sought by most of these cooperative endeavors. Because the most recently revised FSC standards for the Southeast and Appalachian region are flexible with respect to silvicultural tools, cooperatives may want to use an adaptive management framework. Adaptive management allows the cooperative to set measurable outcomes (i.e., species regeneration), test those outcomes, and change management prescriptions when and where necessary, if they are not seeing desired outcomes (Walters, 2002). Adaptive management also creates an opportunity for increased levels of ecological literacy in cooperative participants because landowners will need to engage in defining the desired outcomes and participate in monitoring forest change relative to those outcomes (Walters, 2002).

9. Using BMPs and Well-planned Roads at a Minimum

Well planned roads and skid trails that adhere to BMPs can help overcome the erosion and sedimentation challenges associated with low-impact harvesting and uneven-aged silviculture (Yoho, 1980).

10. Regeneration

Natural regeneration of oak and hickory in uneven-aged management with heavy deer browse may require labor and practices that are cost prohibitive and nontraditional. Landowners can practice a type of “forest gardening” that discounts the cost of labor (Hull et al., 2004). Landowners can intentionally plant

desired species, protects them from browsing with shelters, and control competition until these crop trees are released into the canopy. The cost in time and equipment may be infeasible for large acreages.

11. Entice Service Providers

This study revealed that cooperative endeavors can entice participation of loggers and other service providers by paying them a premium (i.e., 20%) for their services to compensate for the lower value, lower volume and extra costs of worst-first, low impact harvesting. Appalachian Sustainable Development has utilized this strategy successfully. The incentive can be funded by the profits of value-added processing, access to low interest loans, or from grants that subsidize the cooperative. Hopefully the incentives will not be needed after proper forest management has sufficiently increased the size and value of the trees so that harvesting is profitable on its own. A related technique, utilized by the Massachusetts Woodlands Cooperative, is to allow the logger to sell and profit from the higher grade material without and restrictions created by the cooperative. It is also possible to pay service providers an hourly rate rather than a rate based on volume and grade of harvested material, although no example of this has been found. Cooperative endeavors can also use a premium as an incentive for loggers to meet OSHA safety requirements.

12. Subsidies

This study revealed that there exist numerous low interest loans, foundation grants, and government programs that can and want to assist cooperative forestry endeavors with key functions such as certification, marketing, data base development, and other activities needed to “prime the pump.”

Chapter Eight: Conclusions

The results of this study suggest that cooperative forestry endeavors provide an opportunity to respond to the social, economic, and ecological conditions of forests and forestry being created by globalization, decentralization, specialization, and urbanization. Cooperative forestry endeavors such as those studied here can build community capacity, improve ecological qualities, and enhance local economies.

More specifically, cooperatives can foster ecological literacy with the creation of social networks that obtain and distribute trusted management advice. Cooperatives can increase ecological health by emphasizing BMPs and certification as well as by making affordable management that removes invasive, exotic species, unhealthy conditions, and trees of low quality (i.e., worst-first harvesting). In addition, by coordinating among multiple owners, they have the potential to implement cross-boundary management issues needed to conserve ecological systems in a fragmenting landscape.

The results of this study also suggest cooperative forestry endeavors can successfully do for forest landowners what agriculture cooperatives have done successfully for farmers for years. Cooperative forestry endeavors can help individual landowners sell their products at competitive prices by providing product marketing services. Additionally, cooperative forestry endeavors can provide landowners access to equipment and supplies at competitive prices by purchasing outright equipment or supplies in greater quantities. And finally, cooperative forestry endeavors can provide access to competitively priced services such as low-impact or amenity emphasized harvesting, advice, legal, and credit.

These cooperatives are reaching out to forest owners missed by traditional service providers and outreach programs by emphasizing a different set of services coming from a different set of trusted sources. Perhaps even more importantly, the cooperative forestry efforts studied here illustrate voluntary, community-based forest management which emphasizes both the health of the ecosystem as well as the health of the community, offering socially acceptable alternatives to the traditional top-down, regulatory approach to management that has dominated public and private forestry for so long (Rickenbach et al., 2005). Alternatives that some have suggested can and will be the

most effective form of management if collective, widespread management across boundaries is to be achieved in the future (Sample, 1994).

Professional forestry along with local, state and federal governments are only marginally involved with cooperative ventures: the results suggest that they are tolerant or perhaps mildly supportive. There is much they can do to assist cooperative ventures achieve goals that are shared by these traditional state programs. These programs need financial, technical, and organizational support from professional local, state, and federal governments. To the extent that they can, local, state and federal governments need to provide cooperative forestry efforts with technical, organizational, and financial assistance as a means for building local capacity. Technical support could include business and marketing plans as well as silviculture and low impact harvesting techniques. Organizational assistance could include community facilitators to organizing landowners, inventory support, staffing from economic development incubators, and advocacy by existing land owner outreach programs. Financial assistance could include low interests loans, start-up grants, and space at industrial parks.

A review of twenty-four private forest management programs (national and international) conducted in the state of Minnesota, nine of which were fully incorporated business cooperatives, supports the need for state subsidy programs benefiting such efforts (Nadeau et al., 2005). It was found that a critical component of successful cooperative efforts has been systematic public financial support; in the US where public financial support for such endeavors is piecemeal at best, cooperative endeavors have largely been unsuccessful (Nadeau et al., 2005). The review provided the following suggestions for what increased, systematic public funding might look like: 1) a portion of the property tax on NIPF land could be allocated to private, cooperative forestry programs allowing them to provide forestry services, 2) a portion of the property tax credit or income tax credit for land enrolled in a forest management incentive program could be allocated to cooperative forest management organizations to provide forestry services, and 3) the forest industry could pay a procurement fee for wood received by their mills from NIPF land that would be used to pay part of the cost of procuring wood by cooperative forest management organizations/associations (Nadeau et al., 2005).

Cooperatives offer another solution to helping landowners to keep forest in forests—a goal that benefits everyone because of the enormous ecological services healthy forests provide. There is a need for programs and strategies that target aging landowners because these are the people who will be faced with dividing and distributing their forest land to their children and their heirs who can be somewhat disconnected from the land. There is a need for programs and strategies that target “exurbanite”, politically connected landowners. These are the folks who are envisioning, starting, and joining cooperative forest endeavors and who are more likely to engage in forest management activities because of this participation (Rickenbach et al., 2005). There is also a need for programs and strategies that emphasize value not volume, programs that emphasize small, value added niche products and the marketing of such products. There is great opportunity in and around urban forests because these forests are close to markets that pay premiums for quality and character.

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Appendix A: Interview Guide

What do you see are the problems/issues facing your region and how does a venture like yours attempt to address these problems/issues?

Economic Impacts

“How will this venture contribute to a local/regional economy?”

- How will this venture help to keep profits locally? Is there a multiplier effect within the community from such a venture?
- How will this venture create local jobs, increase hours worked, and affect wages?
- How will this venture help to develop new local industry or strengthen existing industries,
- What spin off jobs or businesses could this venture potentially create?
- How will local skills and expertise be enhanced?
- Build a critical mass that enables other business cooperatives?
- Tourism
- How will this venture contribute to the local tax base?
- Will people affected by this venture be more likely to afford health insurance?
- Will the venture create new markets for existing products in the region?

Community

“How will this venture contribute to the health and vitality of the community?”

- How will you generate these impacts?
- How will your venture incorporate community and regional identity in product marketing?
- How will it help the community be known (by people within and outside the community)
 - What new community capacities are likely to emerge
 - networks, groups, leadership
 - access to resources and various types of capital
- How will current community capacity be strengthened?
 - Are there things that work well in your community or that you’re known for, things that could work even better with such a program?
- How will benefits/impacts of cooperative be shared within the community?
 - Among poor, minorities, landless, landowners, wealthy, etc.
 - What mechanisms are in place or will be put in place to ensure this benefit sharing?
- What other local groups support your efforts? How? Why?
- What are the perspectives of local government, Chamber of Commerce, Board of Supervisors, etc.

- What are your efforts to engage the local community?

Environment

What impacts do you hope your program will have on the local environment

- How will you generate these impacts?
- Specifically define what environmental qualities will be sustained or protected or improved through this program
 - o Soil
 - o Water
 - o Wildlife and Biodiversity
 - o Scenery and related amenities
 - o Ecological health and resilience
- What management actions will cause each to occur?
 - o How will you ensure the quality of these actions?
 - o How will you monitor if your environmental goals are being achieved?
 - o Have you considered using a certification program? If so, what program and why?
- What do other natural resource and environmental professionals think of these actions and goals?

Economic Feasibility

What are your plans to make your program profitable, or at least sustainable?

- What are your greatest allies in this effort? What are your greatest obstacles?
- Most of these types of ventures struggle for the following reasons. How will you respond to these challenges?
 - o Access to capital is not secured over the long-run
 - o An unclear vision and mission
 - o Evolving member interests
 - o Ineffective Board and other leadership
- Is there enough knowledge and expertise in all aspects of the coop (i.e. certification, management, planning, harvesting, value-added processing, marketing, running a business, etc)?
- Poor or inadequate marketing to members, buyers, the local community, local government, etc.
- Lack of available financial incentives
- How many landowners do you need to make the effort profitable? How much volume, infrastructure, etc? How will you find these people?
- What are plans to recruit qualified service providers to do the work (i.e., harvesters, foresters able to certify)
- If not profitable, what other sources of income will keep the effort self-sustaining? Are they secured over the long-run?
- What are the most difficult costs for you to recover?
- What markets do you have for these products? How were they developed? How are they likely to change?
- How many people are currently involved in the project? How are they involved? Why are they involved?

- Is there local/regional demand for the services and/or goods provided by the venture?

Appendix B: Record of Primary Data Collection

Blue Ridge Forest Landowner Cooperative

Contact	Informant	Date
Field Day	BRFC Board and CEO	11/04
Informational Meeting	BRFC Board and CEO	04/05
Interview	CEO	1/23/06
Interview	Board Member	2/2/06
Meeting	Board of Directors	5/16/06
Membercheck	CEO	5/27/06
E-mail	CEO, Board Members	A Number of Times

Appalachian Sustainable Development

Contact	Informant	Date
Interview	Marketing Specialist	1/17/06
Interview	Executive Director	2/10/06
E-mail	Marketing Specialist	3/13/06
Interview	Mill Manager	3/15/06
Telephone Interview	Contracted Forester	3/17/06
Telephone Interview	Product Consumer	3/20/06
Telephone Interview	Builder	3/20/06
Telephone Interview	County Government	3/15/06

Conservation Forestry Program

Contact	Informant	Date
Interview	Program Manager	1/30/06
Interview	Program Assistant	1/30/06
E-mail	Program Manager	2/28/06
E-mail	Program Manager	4/25/06

Grayson LandCare

Contact	Informant	Date
Meeting	Organizers	11/29/06
Meeting	Organizers	12/07/06
Meeting	Organizers	1/11/06
Meeting	Organizers	1/24/06
Interview	Program Organizer	2/18/06
Interview	County Government	3/13/06
E-mail	Organizers	A Number of Times

Professional Forestry

Contact	Informant	Date
Interview	Program Specialist with VDOF	1/18/06
Interview	Wood Utilization Specialist with VDOF	1/18/06
Interview	Professor of Forest Engineering	1/20/06
Interview	Water Quality Specialist with VDOF	2/1/06
Interview	VDOF Southwestern Virginia Regional Forester	2/10/06
Telephone Interview	MWC Extension Forester	2/ 12/06
Interview	FSC Certified Forester	2/13/06
Follow-up Telephone Interview	MWC Extension Forester	3/17/06
Interview	Professor of Human Dimensions of Natural Resource Management	4/1/06
Interview	Dean of Extension and Outreach	4/106
Interview	VT's Sustainable Forestry Initiative Head	4/1/06
Interview	FSC Certified Forester	5/16/06

Appendix C: Case Study Contact Information

Blue Ridge Forest Cooperative

Address: 4615 Mountain Pride Road
Hiwassee, VA 24347
Phone: (540)-639-3077
E-mail: Co-op@nextgenwoods.com
Website: www.publicecology.org/brfc/

Appalachian Sustainable Development

Address: 366 West Main Street Ste 400
Abingdon, VA 24210
Phone: (276)-623-1121
E-mail: asd@eva.org
Website: www.appsusdev.org

Conservation Forestry Program

Address: 146 East Main Street
Abingdon, VA 24210
Phone: (276)-676-2209
E-mail: slindeman@tnc.org
Website: www.nature.org/wherewework/northamerica/states/virginia/misc/art8136.html

Grayson LandCare

E-mail: jmoles@igc.org
Website: <http://publicecology.org/graysonlandcare/index.html>

The Massachusetts Woodlands Cooperative

Address: 1 Sugarloaf Street, South Deerfield
MA 01373-1119
Phone: (413) 397-8800
Website: www.masswoodlands.coop/

Mountain Association for Community and Economic Development

Address: 433 Chestnut Street
Berea, KY 40403
Phone: (859)-986-2373
E-mail: info@maced.org
Website: www.maced.org

Healthy Forests, Healthy Communities

Address: 620 SW Main Ste 112
Portland, OR 97205
Phone: (503)-221-6911
E-mail: info@fhfcp.org
Website: www.fhfcp.org/