
International Forestry Resources and Institutions

Research Program

W04I-26

12/10/04

THE EVOLUTION OF FOREST GOVERNANCE AT MAY CREEK FARM: 1996-2004

by

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with

Krister Andersson, Julie England, Robin Humphrey, David Kipkirui Langat, Elinor
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On behalf of the staff, students, and visiting scholars of the IFRI research program at Indiana University, we would like to thank the members of May Creek Farm, Inc., for their time, energy, and candor in making this research possible. We were invited into their homes and forest, they met with us on multiple occasions, and answered our questions with openness and clarity. For this we are grateful. The class would also like to acknowledge the wisdom and support of Krister Andersson, Elinor Ostrom, and Arun Agrawal for introducing us to and leading us through the IFRI methodology. We want to extend our gratitude to Robin Humphrey and Julie England for their database support, J.C. Randolph, Lauren Persha and Diego Pacheco for their help in the class and field, to all of our field biologists for their guidance in our forest mensuration studies, and to Teena Freeman who edited the final text. Finally, we would like to thank the Center for the Study of Institutions, Population, and Environmental Change (CIPEC) for its support under a grant from the National Science Foundation (#SBR-9521918), The Ford Foundation (#950-1160-2) and the Workshop in Political Theory and Policy Analysis for its resources and cooperation.



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EXECUTIVE SUMMARY

This study reports on the third follow-up visit to the community and forest of May Creek, in south-central Indiana in September and October of 2004. The analysis was conducted by the International Forestry Resources and Institutions (IFRI) class at Indiana University. The story that emerges is one of the evolution and change of a forest, a community, and the surrounding institutions.

The research conducted used IFRI techniques to measure changes in both forest conditions and the institutions governing forest use. Forest conditions were assessed using forest mensuration techniques including the collection of data on tree diameters and species frequency occurring on random plots throughout the forest. Basal areas were then estimated. These findings were then compared with previous visits to May Creek, other IFRI sites in southcentral Indiana, and data collected by IFRI collaborative research centers around the world. Data for the institutional analysis were collected through attendance at council and community meetings, semi-structured interviews with the majority of community residents, and repeated email correspondence with community members.

Since the previous visit in 2000, several major events have taken place at May Creek. The most interesting findings are summarized below.

Forest Health

Aerial photographs of the forest allow for a comparison of land use and land cover change over the past 65 years. Combined with global positioning systems (GPS) and geographical information systems (GIS), we are now able to see specific changes in forest cover over time. Current forest cover is in excess of 90%. In the 2000 study, the May Creek forest was separated into a community forest and the homesite forest in order to analyze the differences in management techniques between communally and privately owned property. We have maintained this distinction in our analysis.

Several significant findings emerge from our analysis of forest health. First, current measurements of the community and homesite forests indicate that conditions in both forests are typical of similar forests found regionally in southern Indiana; in particular, this forest is in a later successional, second-growth stage of development. Second, the forest appears to be changing from a mixed-hardwood stand to being dominated by more mesic species such as sugar maple and tulip poplar, which prefer moister, damper undergrowth environments. This is typical of late successional forests. Finally, May Creek community member's forest usage is limited and their management of the forest is fairly unstructured, likely leading to the particular health of the forest that we now see.

Revision of Rules and Regulations

In 2002, the May Creek council began to formally revise the rules and regulations of the community for the first time since their inception. One of the noteworthy changes is a clarification of the decision-making criterion. In the past, discrepancy existed over majority versus consensus decisions. Now decisions are to be made by a majority vote of 50 percent plus one on any decision regarding private property or community issues that do not deal specifically with legal issues. Community legal matters will require a two-thirds majority to pass. This change calls into question what the community means by consensus and how it will go about achieving collective decisions in the future.

Increasing Heterogeneity of Community

As the residents of May Creek age, community heterogeneity has increased. This is most evident in the diversity of views over the perceptions of private ownership rights. At issue is the difference in ownership rights and responsibilities on communal and private land. Increasingly, residents view their private homesites as private property and seek to use the land as they see fit, regardless of established community rules and norms. To date, the majority of community members share beliefs about the forest, but future challenges may emerge as they continue to invest their time and resources into their homesites rather than communally held forest land.

Major Challenges

The positive outcome of the community's effort to conserve its forests does not mean that the community has been free of "trial and tribulation". On the contrary, since the program's last visit, the community has been confronted by several major challenges. First, the community's tolerance for poaching was breached, and community members are seeking a solution to reduce future poaching. These concerns stem from both sustainable harvesting practices and the theft of cultivated ginseng from private homesites and yards. Second, a community-dividing conflict arose in 2002 over construction on a private homesite. This particular conflict brought out multiple issues for the community regarding communication failures and the decision-making processes. Third, there has been a struggle to maintain previous levels of communal participation in meetings, work days, and in making community decisions. This came to the foreground in recent discussions about the construction of a new community center.

Outlook for the Future

Several interrelated concerns regarding the future of May Creek are worth mentioning. First, many Creekers expressed concerns about taking care of the forest as the residents grow older, and worried about whether they would be able to continue to live at May Creek into their old age. Following from this issue, planning for retirement is a second concern of several members of May Creek. The community holds a wide variety of opinions about active management of the forest and potential revenue-generating activities on the land, both consumptive and non-consumptive. Third, as the community ages, residents of May Creek are interested in the future role of the children that were raised at May Creek, the second-generation of Creekers. This leads to issues about adding new homesites, expanding construction on existing homesites, voting rights of the second generation, and second generation interest in returning to the farm.

On the positive side, May Creek has endured great challenges in the past and has survived for over twenty-five years. It provides an example for others interested in establishing a long-lasting communal organization. More recent challenges have forced the Creekers to re-examine how their thoughts and beliefs about the community have changed over time and to renew their commitment to achieving their vision and goals of sustainable, communal living in close relationship with their natural environment. The Creekers have become a family, closer than many biological families and share joys, overcome obstacles, and persevere together. We look forward to revisiting the community several years from now to see how May Creek has progressed.

INTRODUCTION

Since 1995 the International Forestry Resources and Institutions (IFRI) research program has conducted numerous studies and revisits to five local southern Indiana communities including May Creek Farm, Inc. All five communities encompass forests that are owned and managed by a group of people, have well-defined user groups involved in the management of clearly defined forests, and all groups manage their forests collectively through a variety of institutional arrangements (Poteete & Welch, 2004). Though none of these communities rely on the forest for subsistence, all use a variety of forest products. Past studies of these communities have provided useful information regarding the role of institutions for forestry management. Institutions are commonly understood as the “rules of the game,” which define actions that must, may, or must not be taken under particular circumstances (Ibid). Past studies on the local communities have focused on the development, evolution, interaction, and consequences of institutions on the condition and or health of their community forests.

It is believed that as recently as two hundred years ago eighty-five percent of Indiana’s land was forestland. However by 1900, Indiana forests comprised only seven percent of the original amount of forestland in the state (approximately 1.5 million acres). Forests had been replaced by rapid human settlement focused on agricultural production, and Indiana was a leading producer of forest products (Tormoehlen, Gallion and Schmidt, 2000). Since the 1950s, documentation of growth and change in Indiana’s forests indicates that forests have continued to grow despite a continued increase in human population (Ibid).¹ During the period 1967-1998 there was a statewide increase in forestland which suggests that land conservation initiatives and programs as well as other efforts have been successful in preserving the forests that remain. Forestlands are currently approximately 4.5 million acres (Ibid).

Forest degradation for the past several decades has become and continues to be an important global issue for scientist, policymakers, and scholars in many disciplines due to its significant role in environmental quality (biodiversity, supply of air, water and soil), community economies, and other domestic values such as recreation and nature appreciation. However, the majority of conventional forestry research focuses on the biophysical rather than the demographic, economic, or institutional aspects of changing forest conditions. Furthermore, in the past little effort has been devoted to studying and understanding the conditions under which collective action arrangements have maintained and even improved forest conditions through innovations in institutions and stewardship (Poteete & Ostrom, 2004). More recently scholars have identified multiple factors that may lead to successful outcomes for management of the common pool resources such as forests including: the characteristics of the resource; the characteristics of the group; the institutional arrangements; and the external environment (Gibson, Williams and Ostrom, 2004). Extensive research since the mid-1980s has built a strong case for the assertion that local users can and have constructed institutions to use their natural resources sustainably (Ibid). Currently the challenge that policy analysts face is to identify which *institutional factors* are most important in achieving successful management of resources at the local level (Ibid). Past studies of the Indiana IFRI sites indicate that management strategies for forest resources and products vary across the five local communities. This provides an opportunity to study the relationship between the biophysical and economic impacts of forest

¹ The current population of Indiana is approximately 6 million people.

conditions, and their relationship to the underlying causes and consequences of institutional structures (Poteete and Welch, 2004; Poteete and Ostrom, 2004).

The International Forestry Resources and Institutions (IFRI) Research Program

IFRI is a research approach that generates information about forest conditions and the institutions that enhance forest sustainability. IFRI was established and developed at Indiana University – Bloomington (IFRI Manual, 2004). The IFRI approach uses a common set of interdisciplinary variables to study the forest, the people who use the forest, and the institutions they develop to manage the forest (Ostrom & Wertime, 1994; CIPEC, 2004). Demographic, economic, and institutional data are collected using a combination of group and individual interviews, archival and legal documents, and biophysical data from forest plots to evaluate forest condition (Ostrom & Wertime, 1994; IFRI Manual, 2004). The research conducted under the IFRI protocols focuses on several core questions and preliminary hypotheses that attempt to ascertain the variety of causes and consequences of demographic, economic, institutional, and biophysical attributes to explain forest conditions. An international network of Collaborating Research Centers (CRCs) participate in the IFRI research program which continuously monitors and reports on forest conditions; deforestation rates; activities and outcomes achieved by community organizations; governments; businesses; and non-governmental agencies in their country or region (Ostrom & Wertime, 1994).

IFRI began conducting research on local-level community managed forests in Indiana in 1995 and on May Creek Farm, Inc. in 1996. May Creek has been revisited twice since 1996, in the fall of 2000 and again in the fall of 2004. Our current study, the second revisit of May Creek, seeks to identify and analyze changes in the condition of the forest and link this phenomenon to changes in institutional arrangements since the earlier visit. This year's IFRI study focuses on May Creek Farm, Inc.'s local-level community governance of its two forests, the May Creek forest and the homesite forest. We have learned a lot from the previous two IFRI visits about the institutional arrangements that govern their forests, shape the community, its members, and their values.

During the 2004 visit we focused on identifying the current relationship between the condition of the two forests and institutions. Specifically we consider:

- *What is the current composition of the forests at May Creek Farm, Inc., and what are the differences that exist between the May Creek forest and the homesite forests?*
- *How have these forests changed since IFRI's last visit?*
- *Can these differences be linked to differences in institutional arrangements for the May Creek forest and homesite forest, and or changes in institutional arrangements since the 2000 visit?*
- *How do forest conditions change as the distance from each homesite increases?*
- *Does the lack of rule monitoring and enforcement in the homesite forest explain this variation?*
- *Have the most current changes in decision-making institutions (both formal and informal) affected forest management decisions and conditions since the previous visits?*
- *What are the consequences for member heterogeneity on forest management and conditions, the limitations associated with the development of institutional arrangements for conflict management and resolution, and the decline in individual participation in community activities?*

- *What are the implications of the current lack of monitoring and enforcement with regards to poachers and the potential consequences for forest conditions?*

METHODS

Both our biophysical and socio-institutional analyses are based upon extensive fieldwork related to various aspects of the May Creek community. Specifically, our fieldwork consists of plot sampling and forest mensuration techniques, GIS and remote sensing, as well as group and individual interviews.

Group and Individual Interviews

Most of the socio-economic, demographic, and institutional data were collected through extensive group and individual interviews, discussions, and conversations with various community members throughout our visit. We joined the community members for a potluck brunch, community meetings, council meetings, and for a weekend party. We held group and individual interviews with community members in their homes, the community shelter house, and at various locations in Bloomington. We also arranged interviews with available second generation Creekers to obtain specific information about their issues and concerns. After interviewing the majority of households in the community, we conducted a semi-structured follow-up email/telephone interview on a series of important issues to collect additional information and seek clarification on several points.

Information pertaining to community rules, government regulations, major events etc. was also obtained from various community documents such as newsletters, membership packages, meeting minutes, by interviewing representatives of the Indiana Department of Natural Resources (DNR), the Monroe County Planning Commission, and the Monroe County Sheriff's Office.

Plot Sampling and Forest Mensuration

A random sample was conducted over the entire May Creek Farm and was stratified to ensure adequate plots were sampled in both the May Creek forest and the homesite forest. A grid of more than one hundred numbered points was created in a Geographic Information System (GIS) covering the entire May Creek Farm area. Points were then numbered in succession and a random number generator was used to select numbers within a range that corresponded with the number of points.

Field work teams were divided into four groups. We first located the approximate location of the center of each plot using a Global Positioning System (GPS) device, and then we observed and recorded general conditions of the plot including exact geographic location, soil, elevation, slope, aspect, percentage of crown cover etc. Within a circle of 3-meter radius, we recorded information on species name, diameter at breast height (DBH), and estimated height for all shrubs and saplings with a DBH greater than 2.5 cm and less than 10 cm. Within a circle of 10-meter radius, we recorded information on species name, DBH, and estimated height for all trees with a DBH greater than or equal to 10 cm.

After the first day of forest data collection, the number of species encountered and the range of DBH were plotted on a performance curve over a cumulative range to determine whether an adequate sample size was reached. The analysis of the performance curve after the first day of forest data collection indicated that a large variance remained and that further data collection was required. The

same procedure was used for the data collection during the second day of fieldwork. The level of the performance curve indicated that an adequate sample had been collected. We collected forest data for 14 homesite forest plots and 31 May Creek forest plots, for a total of 45 plots.²

GIS and Remote Sensing

Historical land cover data from 1939 to 2003 in the form of original aerial photographs and processed grid maps were obtained from the Center for the Study of Institutions, Population, and Environmental Change (CIPEC). We later conducted a time series land cover and land use change analysis of May Creek and its vicinity based on these data. Digital May Creek property boundary and road data from the IFRI 2000 visit together with topographic and various other vector geospatial data assisted our forest sampling and analysis work immensely through the use of GIS. In addition, one team member spent a half day walking the community and forest perimeter taking GPS readings of houses, major structures, driveways and the road, which were later used to update the community map.

Forest Analysis Methods

Forest data are presented in three comparative analyses in which data are examined to spot trends in: the relationship of forest cover to biophysical location (i.e., elevation, and aspect); the relationship of forest cover to human-induced changes (i.e., May Creek vs. homesite forest, distance to roads, and house density); and the evaluation of changes in forest condition relative to prior visits.

The relationship of topography to tree growth is tied closely to the amount of soil moisture available to a tree at a particular location. Generally, soil moisture is inversely proportional to elevation, slope, and slope position, and varies by aspect or direction. A statistical analysis was conducted to assess whether a relationship exists between topographical variation and the biological values used to measure plot condition. Values for topographical classes were determined from a one meter resolution digital elevation model of May Creek Farm in a GIS. Surface analysis was used to convert elevation to slope and aspect. Determination of topographical classes was carried out by dividing the range of values by the number of classes used. The number of classes was determined through a combination of past analysis and desirability of results. Forest data analysis was completed by transferring all field data to an electronic database. Tree level data were then aggregated by plot number to assign per plot average values for DBH, tree height, basal area, and density. Calculations of each forest value were completed following the protocols described by Cox (1990). The position of each house was recorded with a global positioning system (GPS) device and imported into a geographic information system (GIS). Data indicating the density of homesites were created in a GIS using ArcGIS 9 (ESRI 2004).

² GIS was used to ensure that plots were distributed in proportion to forest land area for elevation (less than 185 meters as low, and greater than 185 meters as high) and for aspect. The analysis proved that the random sample of plots selected for the forest adequately represented these perspectives of topographic change within the forest.

MAY CREEK SITE OVERVIEW

General Description of the Site

The May Creek community is located in south-central Indiana in the southwestern corner of Monroe County. It falls within Indian Creek Township (Figure 1) and is about 13 miles from the city center of Bloomington. The land has an average elevation of 750 feet (223 meters). May Creek is situated on the Interior Plateau, which is characterized by layers of sandstone, siltstone, shale, and limestone. May Creek is named after a creek that runs through the settlement. The local people call themselves the “Creekers.” This area has relatively distinct seasons in terms of average temperature and precipitation (Table A1 in Annex A).

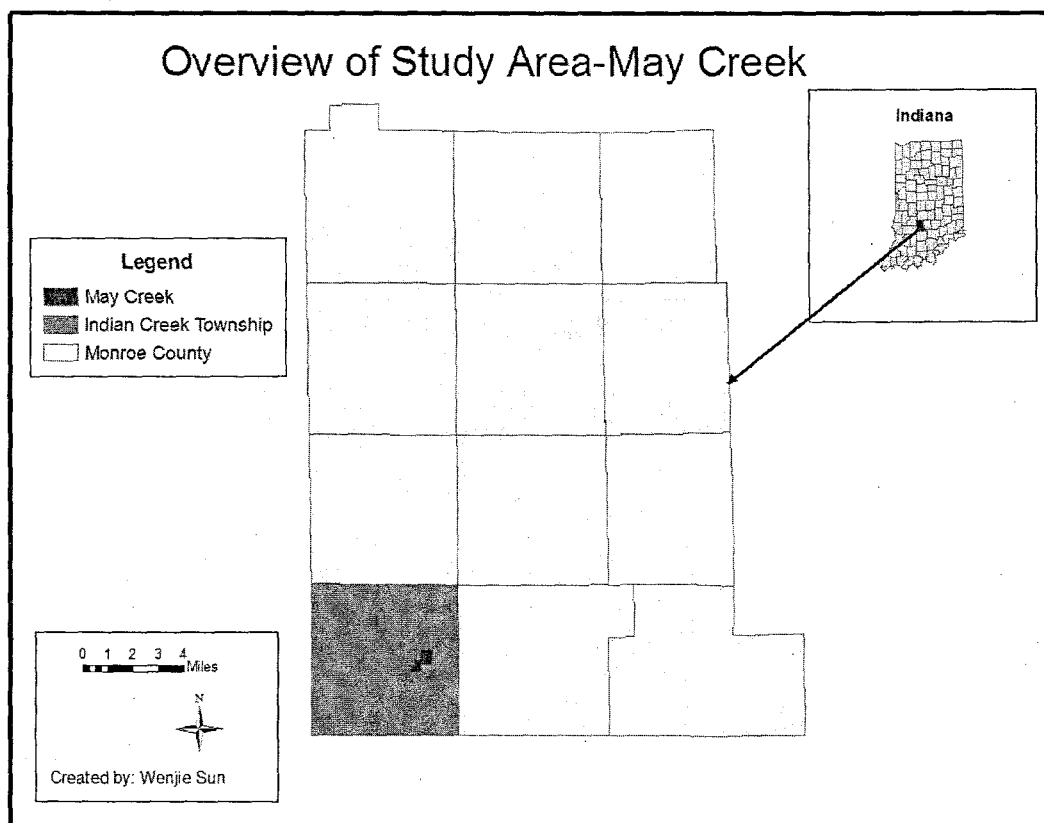


Figure 1: Overview Map of the Study Site

Geologically, southern Indiana is different from the rest of the state. Glaciers stopped just north of Monroe County before receding during the last major glacial period, thus preserving the rolling hills and naturally formed soils of this region. May Creek Farm Inc. falls within this landscape.

The study site consists of two forests distinguished by ownership. The May Creek forest is communally owned and is well forested with the exception of a section of open grassland used primarily for haying and gardening, a pond, and a community shelter house. The homesite forest consists of 16 homesites, 11 of which have homes built on them and 13 of which have some form of built structure. Residents refer to their settlement on the homesites as “Woodland Cottages.”

Homesites are privately owned by community members, who are legally recognized as share holders of the May Creek Farm Inc. The homesites are generally forested, though owners have cleared trees around their homes to varying extents. A well-maintained gravel road crosses the community, with drainage structures and a bridge that links the two sides of the stream. Utility lines running along this road provide the community with running water, electricity, and telephone service (Figure 2).

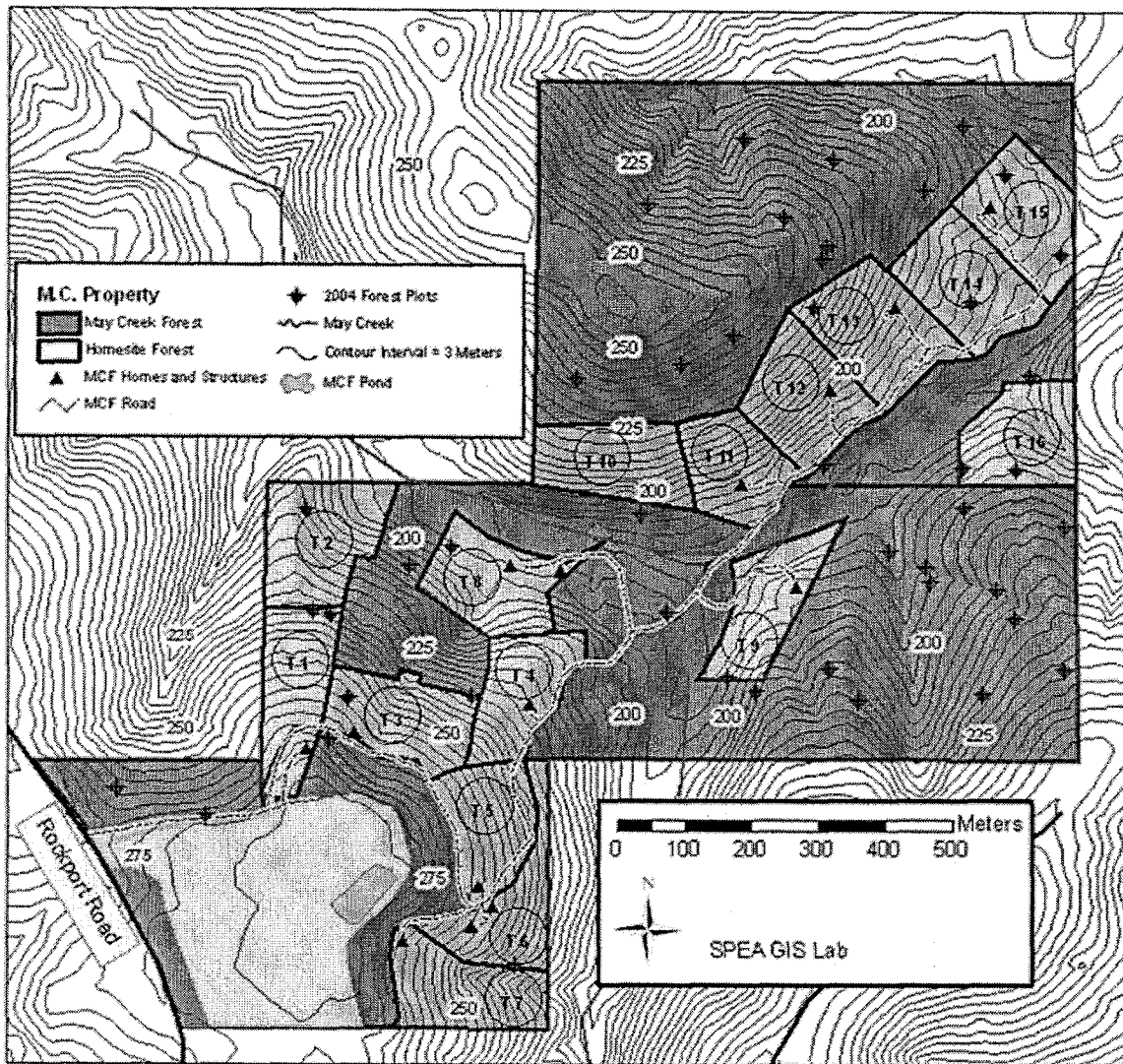


Figure 2: Detailed Map of the May Creek Community

Historical Land Use and Cover Change in Southern Indiana

Prior to European settlement in the early 1800s, the landscape in southern Indiana was primarily forested. After European settlement, most of Indiana was cleared for agricultural use. Much marginal farmland was gradually abandoned, and secondary forest regrowth has occurred. The interaction between declining prices of agricultural products and heterogeneous land quality, especially slope and soil type, has played a significant role in determining land use. In southern Indiana national and state forests are scattered among agricultural land and private forest land. Unlike many other parts of

the U.S., private land is the largest component of forest cover in southern Indiana with forest ownership divided among private farmers (39 percent), other private individuals (38 percent), public lands (13 percent), and private corporations (10 percent) (Birch, 1996). The objectives of these varied forest owners may range from the preserving forest cover for aesthetic reasons to timber production. Contrary to some expectations, much forest regrowth has occurred on small, privately-owned, fragmented parcels (so-called non-industrial private forestry or NIPF).

Nearly one half of Monroe County's land cover is forest, with the rest a mixture of farmland, development, open space, and water. The county features a rapidly growing urban area (i.e. Bloomington), as well as a considerable amount of land with rural characteristics, thus is typically characterized as a rural-urban interface. In a 1998 NIPF land owner survey of around 250 households in the County conducted by the Center for the Study of Institutions, Population, and Environmental Change (CIPEC) at Indiana University, it was found that aesthetics and recreation were the two most commonly cited forest benefits perceived by land owners. Residence and land investment were noted as the primary reasons that respondents acquired their parcel, and active protection and mowing were the two most frequent land use activities performed by land owners (Koontz and Kauneckis, 2000).

The following figures and those in Annex A illustrate trends in land cover change in the two May Creek forests and in the surrounding area between 1939 and 2003, with overlays of ownership boundaries from the closest time point available. In general, as depicted in the chart below, forest cover in the study area has been increasing, but with different rates of changes throughout the years. In 1939, the land area was owned by only four owners and approximately 25 percent of the area was deforested. In contrast, more than 90 percent of land was forested in 2003 under May Creek Farm Inc. ownership.³

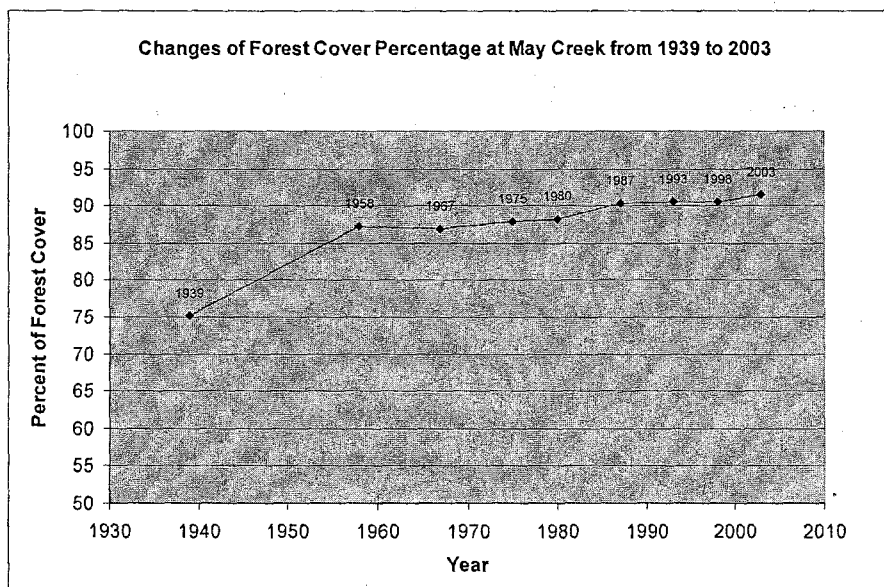


Figure 3: Changes of Forest Cover Percentage at May Creek from 1939 to 2003

³ It should be noted that the forest cover percentage in 2003 is based on a spatial dataset that is different in spatial resolution, exact processing procedures, and thus the level of accuracy from the other years.

Aerial Photo of May Creek and Vicinity in 1939 and Ownership Boundaries in 1928

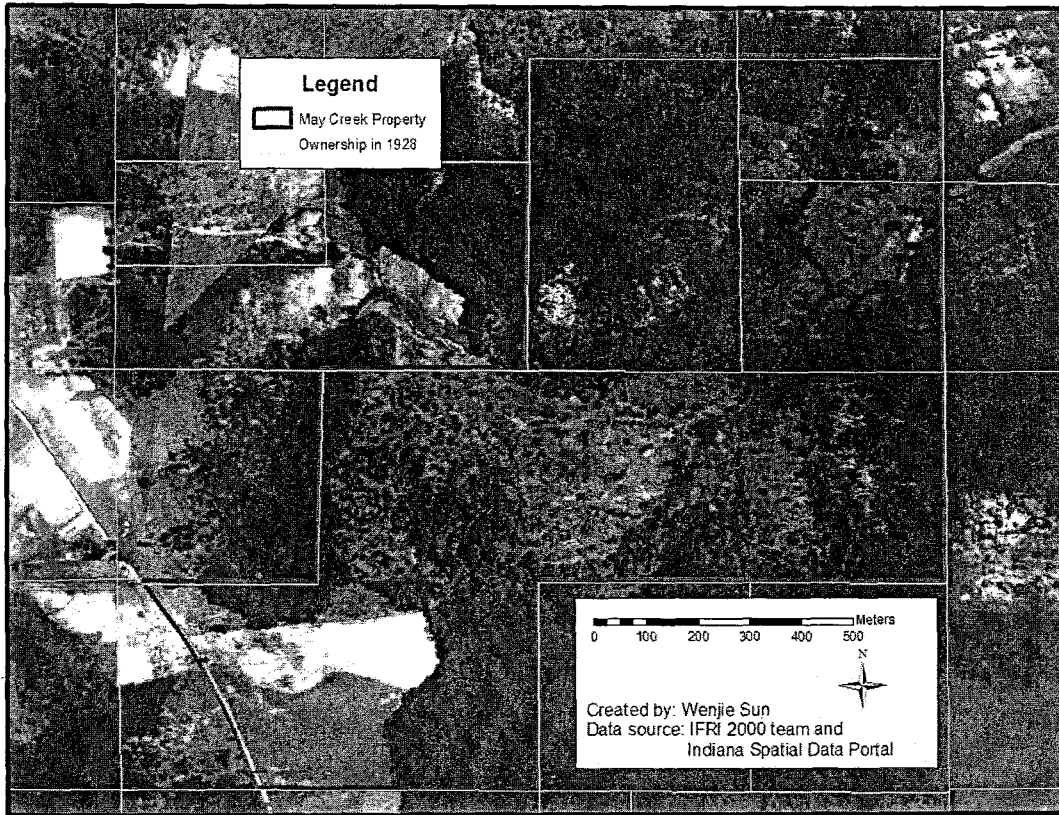


Figure 4: Air Photo of May Creek and Vicinity in 1939 and Ownership Boundaries in 1928

Aerial Photo of May Creek and Vicinity in 2003 and Ownership Boundaries in 2000

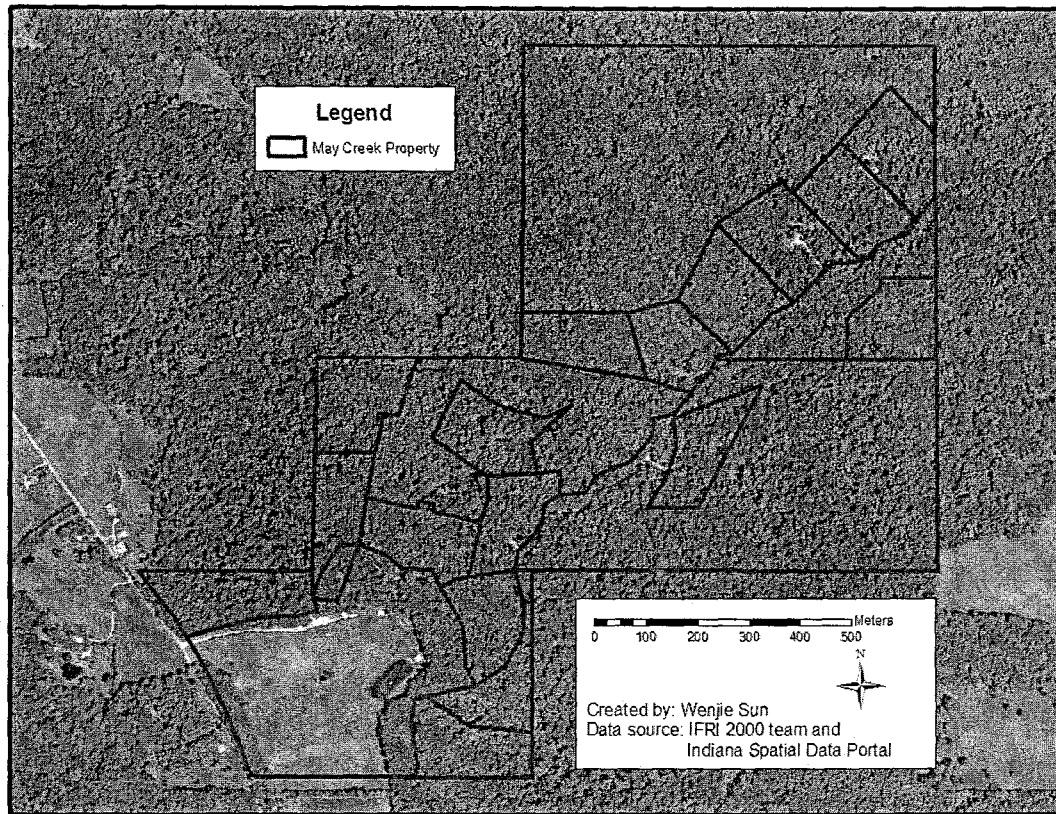


Figure 5: Air Photo of May Creek and Vicinity in 2003 and Ownership Boundaries in 2000

History of May Creek

Table 1 contains a timeline of major community events. The May Creek community was founded in the 1970s and based upon the prevailing values of spirituality, community living, and nature preservation. May Creek Farm Inc. was founded in 1976 after about two and half years of meetings and planning activities. In 1973, the first meeting was held, in which the original leaders envisioned a community of people living and working together to preserve a piece of land for nature conservation and community livelihood. In 1975, members of two different groups, “Blue Springs Farm” and “Patrickburg,” met each other during a public “land buyers” meeting and started to search for land. After looking at a couple of different locations, the May Creek Farm land became available and they immediately decided to pursue the site.

Table 1: Timeline of Major Events in the May Creek Community

| <i>Year</i> | <i>Event</i> |
|----------------|--|
| 1973 | First meetings and organizational activities |
| 1975 | Land negotiation and purchase |
| 1976 | Foundation of May Creek Farm Inc. First settlers move in to 48 shares, dropped to 35 within the same year Phase 1 Planned Unit Development status granted by the Monroe County Planning Commission Community kitchen was built Timber stand improvement facilitated by the Indiana DNR carried out |
| 1977 | Community building built |
| 1980 | Fire destroyed community building |
| 1980-1983 | First private homes constructed Decrease in number of shares to 16 |
| 1984 | Phase 2 Planned Unit Development status granted Road extended into lower parts of the Farm Stand of locust trees planted by community members The first membership package was started May Creek Farm changed from general corporation to Chapter S Corporation |
| 1985 | First water well dug Previous landowner, Cecil Sasser died Community financed land purchase through a formal mortgage with a local bank 104 acres of land was divided into individual land parcels and sold to individual shareholders by payment contracts Members able to obtain loans for home building based on possession of homesite notes |
| 1985 (or 1986) | Community kitchen demolished |
| 1986 | Pond constructed |
| 1990 | Bridge over May Creek completed |
| 2000 | Became an H-corporation (Neighborhood corporation), but still maintains Chapter S Corporation status |
| 2001 | Facilitated community meeting |
| 2002 | Modification of community Rules and Regulations commenced (ongoing) The "studio" conflict erupted |
| 2003 | Shift from decision making norm of consensus to majority vote |
| 2004 | Conflict resolution mechanism under development Harvest of select locust trees for garden fence post |

In 1976, 48 people signed the original contract purchasing the May Creek property, a 304 acre plot of land, selling at a price of US\$380.00 per acre. The buyers paid 10% down and agreed to a 20-year payment contract with the owner, Cecil Sasser. The Creekers created a legal corporation in order to establish group ownership of the property, and to rely upon profitable community-based activities with a goal of self-sufficiency.

During the first months, all members who settled on the land lived in teepees and tents, and all community members ate meals together in the community kitchen. In spring 1977, the Creekers

planted an orchard and garden, which subsequently served as the primary food source for the community. A community building was also built in 1977, in which some families lived and all community members gathered together for meetings and meals.

Following a fire in 1980, when the community building burned down, much discussion and reflection took place regarding the next steps for the community. Some members expressed their intention of having a more private life style and at the same time there was a transition in community membership. Between 1980 and 1983, several members built their own houses. Some members developed their careers and searched for employment.

In 1984, the road was extended to the lower parts of the May Creek land to reach additional future homesite areas. The following year the first water well was dug in the community. In 1984, the community obtained the second phase of Planned Unit Development (PUD) status, which further fostered development in the lower part of the community land. In 1985, when the previous owner died, the community decided to finance their land purchase through a formal mortgage with a local bank on the remaining 104 acres, which had not been paid off yet. These 104 acres of land were divided into individual land parcels and sold to individual shareholders by payment contracts. Members were able to obtain loans for home building based on their homesite notes.

Community-based projects were maintained in spite of the structural changes within the community. The grassland area chosen for recreation was improved. A pond was built in 1986, which was financed through a corporate loan. A shelter was built adjacent to the pond, and in 1990, a bridge was built over May Creek. Although the shared set of core values among community members has remained consistent through the years, Creekers' perceptions of private ownership rights have been evolving ever since the construction of the first private homes in the community. These evolving perceptions in turn have exerted profound impact over forest use decisions made by the community as a whole and by individual members. Changes in the on-farm population of May Creek from IFRI's first visit in 1996 to the current visit in 2004 are found in Table 2.

Table 2: Changes of On-farm Population at May Creek from 1996 to 2004

| <i>Categories</i> | <i>1996</i> | <i>2000</i> | <i>2004</i> |
|-------------------|-------------|-------------|-------------|
| Adults | 19 | 17 | 19 |
| Children | 11 | 5 | 6 |
| Total | 30 | 22 | 25 |

Summary of Previous IFRI Visits

In 1996, IFRI made the initial visit to May Creek. It was noted in this first report that the Creekers had flexible rules, which could be changed to meet the needs of a dynamic community. May Creek's formal rules were the result of extensive discussion among all community members and these rules were clearly stated, recorded, and communicated. Furthermore, the community was built upon and reliant on mutual trust and respect that led to a variety of norms regarding forest use. The Creekers' main use of the forest was non-consumptive (i.e. nature appreciation), although they did harvest ginseng, morel mushrooms, and firewood from the forest for personal consumption. The two different ownership categories of communal and private were recognized in the 1996 visit; however, the analysis of forest cover and condition did not differentiate between the two ownership categories. It was noted that no significant harvesting of trees had occurred during the period of the Creekers' ownership except for the private home building phase. The Creekers planted a few black locust, fruit

trees, and cedars after acquiring the land. Forest management styles were not identical across the two ownership categories. A variety of concerns for the future was also identified in the 1996 visit, including involvement in community enterprises, building a water pipeline, possible development of Inter-state Highway I-69, and the role of the second generation etc.

In 2000, IFRI made the second visit to the May Creek community. More detailed forest and institutional analyses were carried out during this return visit. Two forests, the May Creek forest and the homesite forest, were identified in the analysis based on different ownership structure. Only Creekers, and Friends and neighbors were formally examined as users of the forest in this study, although poachers were also brought up as a major concern in the discussions. Goldenseal was identified as an additional forest product harvested and used by the Creekers. The role of relevant government organizations such as the Indiana Department of Natural Resources (DNR) and the County Planning Commission were also addressed in the 2000 report. The comparison between the forest data from 1996 and 2000 suggested that the community was successfully implementing a “non-interference with nature” policy in their communal forest. Overall, it was shown in the 2000 visit that the May Creek forest was following a normal path of ecological succession in terms of its changing species composition and general structure. The issue of second generation involvement was revisited in 2000.

Major Events since Last Visit in 2000

Since the last IFRI visit in 2000, several major events have shaped community life at May Creek. Five events in particular seem especially important, and as such we return to these in the discussion later in the report. First, in September 2001, Sandy Clark was invited and acted as a facilitator for a one day session almost all community members participated in. The motivation for the meeting was lack of a shared vision and the fact that a number of people felt that their voices were not being heard in the regular forums of business and visioning meetings. Second, modification of the May Creek Rules and Regulations was initiated in 2002 and is still ongoing. Most changes have been focused on clarifying existing rules and regulations; the most important substantive changes are related to procedures to submit building plans with both clarifications and additions. Third, the “studio” conflict erupted in October 2002 and has yet to be resolved. There has been serious and profound reflection among most community members in the wake of this conflict. We discuss some of the aspect of this conflict in the report. In the last few months, the May Creek Farm Council has been working on a procedure for conflict prevention and resolution. Fourth, until 2003 it was an accepted norm within the community that consensus should be reached before taking any decisions or actions. Since 2003, the council has been moving towards implementing the formal bylaw rule of majority vote in order to speed up the decision making process. Finally, in 2004 a man was caught poaching ginseng. He was found to be a repeat offender. Neither the Indiana Department of Natural Resources nor the Sheriff took any action after being notified. Two community members confronted the man with a gun and confiscated the ginseng roots. In lieu of official enforcement, community members forced the man to repay his ginseng earnings from previous outings. Later, the community returned the man’s money out of pity.

RESULTS

INSTITUTIONAL ANALYSIS

Organizational Structure

Members of the May Creek community are organized into two operational groups. The first group includes all members of the community. Members gather for General Meetings, held on the second Sunday of each month. The General Meeting is the forum where issues related to the community and the forest are discussed. After issues have been discussed in detail, all community members in good standing vote to decide whether or not to go ahead with plans for the community and use of the forest. Members in good standing are those members that are no more than three months in arrears on their monthly maintenance payments. Though several shareholders of May Creek do not reside in the community year round, "out of town" members in good standing register their votes on important issues via proxies that are present in the community. All members of the community keep abreast of issues raised in meetings via meeting minutes and newsletters that are distributed via an email tree.

The second operational group is the Council, which is comprised of a group of 5 members and one alternate member. Members of the Council are elected once a year at the Annual May Day meeting. There are four paid positions on the Council: Treasurer, Secretary and two positions for members that take care of plowing snow from the road and other maintenance activities. Other positions, not mutually exclusive to the paid positions include President, Vice-President, Road Commissioner and Member-At-Large. The Council generally meets the Monday night following the General Meeting. While the majority of attendees of Council meetings are officers of the Council, any May Creek member is welcome to participate in Council Meetings. The Council has final decision making authority with respect to topics that were voted on at the General Meeting. In addition to the finalization of major decisions, the Council has discretion to make decisions regarding business matters that affect the community. This change came about approximately two years ago when it was determined that General Meetings were getting very long and bogged down with basic business issues that the Council could more efficiently address.

The May Creek community conducts the majority of its business on a very limited budget. In 2003, the annual budget of May Creek was \$16,000. While their budget is relatively small – May Creekers have been able to accomplish quite a lot. When emergencies arise or capital upgrades are required, May Creek relies upon being able to take out small loans, or drawing on its savings. Decisions to seek funds from outside of the operating budget of May Creek are taken very seriously by community members. Revenue is generated via monthly maintenance fees. Each shareholder is currently required to pay \$85.00 per month. However, the Council is considering increasing this fee to \$100 per month per shareholder.

Due to changes in the community and recognition of the increasingly heterogeneous visions of community and forest use at May Creek, community members met in September 2001 for a

facilitated meeting to come up with a mission statement for May Creek and to undertake medium to long term planning. Acknowledgement that they are a dynamic community in need of revisiting their common ideals speaks to how seriously issues of community and the forest figure into the lives of people who live at May Creek. In addition to being well attended by Creekers who reside at May Creek, the facilitated meeting was well attended by shareholders who do not reside at May Creek and by the second generation of Creekers. The new mission statement, which has been read at the beginning of all meetings since September 2001 is: *To create and nurture community based on respect for each other, nature and responsible stewardship of our land.*

One of the challenges that May Creek has faced in recent years is the issue of getting the majority of May Creek households to participate in meetings and community activities. The fact that some shareholders do not live at May Creek has been identified by community residents as affecting overall participation. Even if off-site members register votes via proxies and spend short periods of time at May Creek each year, members who live at May Creek bear the bulk of responsibility for conducting community affairs and making decisions about forest use. Among the households living at May Creek, there is seldom full participation of all members. It appears that several members dominate decision making processes by virtue of being the ones who attend the majority of General and Council meetings. It was also noted that it is often the same group of people who attend both meetings. Because votes are counted on a per share basis, having one member of a shareholding household present at meetings may not generally be perceived as a significant problem. While members who participate on a regular basis expressed frustration at the lack of participation by all community members, non-participating members generally seemed comfortable with having more active members make decisions on their behalf.

Second generation Creekers indicated that they are unlikely to attend meetings due to the fact that they do not have a vote and because they feel that they are still viewed as "kids." The move to two meetings per month (i.e. General and Council) may be having an effect on the level of participation by community members. It seems that there is significant overlap in the discussions in both meetings, even though several of the same people attend both meetings. To encourage participation of all households the Council is currently considering implementing incentive programs to increase participation. Possible options are to offer a \$5 rebate on monthly maintenance fees to all shareholders who participate in one meeting per month, either General or Council.

Community work days are organized on a monthly basis to undertake tasks that benefit the community as a whole, or address the needs of a sub-set of community members. Examples of activities include cutting deadwood from the forest for the winter fuelwood supply for private households, clearing snow from the road, clearing trees and brush from under power lines, constructing a platform for the recently acquired hot tub, posting "No Trespassing" signs etc. Implementing a system where those that work on community projects would receive "work credit" has also been considered as a mechanism for increasing participation in work days and community activities. The level of community participation in work days has significant implications for how much time May Creekers devote to forest related activities. Second generation Creekers noted that as children growing up at May Creek they have many memories of work days that were organized around forest related activities including the cutting of

deadwood for firewood, mushroom collection, clearing of brush etc. They felt that since many of them have grown up and left May Creek that there has been a decline in community workdays. The role that family plays in promoting participation in community activities has been alluded to by several members of May Creek who have expressed hope that the second generation will return to May Creek and raise their own children there.

Rules in Form vs. Rules in Use

The May Creek community functions under the auspices of bylaws which were formulated at the time that May Creek obtained official legal status in 1976. In addition, members of the May Creek community have written rules and regulations which were formulated in 1982. Though May Creek rules and regulations have not been substantively altered since they were developed in 1982 (there was a minor amendment in 1987), they are currently being revised by members of the Council with input from members of the community. The corporate and zoning status of May Creek Inc. is as an Indiana Chapter S Corporation. This means that corporate profits and losses are distributed equally among the shareholders at the end of each tax season and declared in individual income tax forms. May Creek Inc. can maintain Chapter S Corporate status until it sells off its remaining shares. In 2000, May Creek also obtained H Corporation or Neighborhood Association status. May Creek will automatically transition to being an H Corporation when they sell off their remaining shares. There is no tax benefit associated with H Corporation status. In the event that May Creek Inc. decides to re-survey their land and create new shares – they will be able to continue their status a Chapter S Corporation. May Creek is influenced by the zoning regulations imposed by the Monroe County Government with respect to their status as a planned unit development (PUD), which was established in 1976.

The Monroe County Sheriff's Department and the Indiana Department of Natural Resources (DNR) that have offices in Bloomington also have legal and regulatory frameworks that the members of May Creek adhere to. For example, the DNR has enacted rules and regulations about the timing and method of harvesting of ginseng that May Creek members are subject to even when harvesting ginseng from their private homesites. Though May Creek has very limited interaction with these external agencies, they call upon the Sheriff's Department and the local DNR office for assistance with dealing with ginseng poachers which have been a problem over the past several years.

One of the most interesting findings emerging out of the May Creek 2004 field visit is the apparent disconnect between formal rules and rules that are observed in practice by members of the May Creek community. It is likely that a large part of the disconnect emerges out of the fact that May Creek is currently functioning under bylaws and rules and regulations that were established in the late 1970s and early 1980s respectively, that have not been substantively amended since then. Several changes have taken place over the intermediate years, and the community appears to have become significantly more heterogeneous with respect to their views regarding community and forest use. The move towards substantively revising the operational rules and regulations of May Creek is a natural evolution of institutions, an adjustment to changed circumstances, which may ultimately benefit the community in the long run, assuming that the new rules reflect the foundations of community. May Creek's rules and regulations are currently under revision. Examples of changes in rules and regulations are:

- No one may sell timber or clear cut without council approval (1987)
- No one may sell timber or clear cut on community land (2004 proposed).
- Limited clearing may be done on homesites as need (addition to 2004 proposed)

The importance of this apparent disconnect between rules in form and rules in use is that it not only draws attention to the diverging philosophies of forest use and community living that we perceive to have evolved among community members; it may be catalyzing to some degree conflicts that have emerged between households within the community. For example, May Creek rules and regulations clearly state that community approval is required for the establishment of a non-composting toilet, and that no building should be built closer than twenty feet from the road. Further, once a written rule, it is a well established norm in the community that the felling of trees greater than six inches in diameter should be approved by the Council. While some community members seek approval through the institutional mechanisms that exist to grant approval for such activities (i.e. presenting requests to install non-composting toilets, build etc. for approval at General Council meetings), other households have acted without obtaining formal approvals from the community.

Perhaps the most important disconnect identified during the 2004 field visit between formal rules and rules in use was in the area of decision making mechanisms. Rules and regulations dating from 1987 state that: "The community makes decisions by a discussion of issues and points of view. Decisions are finalized through a process of consensus or two-thirds majority vote on motions." Both the ambiguity of this language and the precedent setting lack of consistency with respect to the selected mechanism for dealing with various types of issues are likely contributing to miscommunications and confusion among May Creek members as to how these decision rules and norms are applied.

In a series of follow-up questions to May Creek households it was revealed that there is very little consistency among community members regarding the meaning of the terms consensus, unanimity, and even majority. Much of the confusion arises over two divergent definitions of consensus. Some equate consensus with unanimity. Others view consensus as agreement emerging from the outcome of discussion, debate, and compromise. These two conceptualizations result in a misunderstanding about the nature of the May Creek rule-making process. One institutional remedy is to clearly define to the group how community voting will work and if it will change under certain conditions. Discussion and debate sessions, veto votes and cases where unanimity is required, quorum requirements, and what it takes to pass legislation should all be specified in detail and widely disseminated to all community members. The community is already actively working on this issue, which should alleviate future confrontations.

An important apparent inconsistency in how decision making processes are applied is a major factor influencing the potential for both conflict and the resolution of conflicts in the community. Lack of consistency and general ambiguity regarding decision making processes over the past several years may have contributed substantially to several conflicts that have arisen in the community. It was noted that several community endeavors influencing the ability of the community to enjoy and benefit from the forest have been halted on the basis of a single shareholder objecting to the proposed activity.

The proposed new decision making rules stipulate that “The community makes decisions through a discussion of issues and points of view. While striving for consensus, decisions are finalized by a process of majority vote of shareholders.” This means that consensus will no longer be the rule in use for either legal or private property decisions and that private property issues will be approved by simple majority. In addition, community issues that do not deal specifically with legal issues will be approved by a simple majority, whereas legal issues will be decided by a two-thirds majority. Due to persistent general confusion regarding decision making processes, the Council has noted that while the general membership has voted to approve new decision making rules in concept, there is a need to formally present the new decision making framework with accurate language clarification before implementing the use of these rules. However, we also note that several community members acknowledged an interest in continuing to strive for consensus on contentious or very important issues that affect all community members. Not having a shared understanding of the key decision making processes, and how legitimate decisions should be made may hamper the communication in the community forums and make the decision making process less capable of aggregating and negotiating preferences. It is of concern that May Creek decision making processes may be characterized by inertia and potential for conflict as long as the conceptual application of decision making processes remain highly variable among community members.

An important point to note is that the *rule* regarding how decisions will be made, for example consensus where all shareholders come to a mutual agreement on a specific issue, or two-thirds majority (where only two-thirds of members in good financial standing are required to pass a motion), or simple majority is separate from the *mechanism* or *processes* for decision making. Several May Creek members expressed concern that a move to 2/3 majority voting would lead to a decline in the amount of discussion and debate that takes place over issues that are important to the community. The historical trend of open communication and coming to decisions which all members of the community are happy with seems to be an important aspect of the May Creek communities’ character. Finding balance between implementing a more efficient decision making rule, and a mechanism or process for decision making that will continue to elicit the involvement of the majority of community members are important goals that May Creek should continue to strive for.

The Challenges of Poaching

When the May Creek community talks about poaching, they are referring to the illegal procurement of non-timber forest products, primarily herbaceous plants such as ginseng or goldenseal. To date, they have had no problems with the poaching of animals, nor has any mention been made of the poaching of morel mushrooms, another forest product prized by May Creekers and others in the region. Poaching has always been a problem on the farm. Several years ago the problem became so egregious that poachers took several thousand dollars worth of cultivated ginseng from the yards of several Creekers. At that point, the cost of monitoring the ginseng was too great to warrant any action, and community members were, for the most part, dissuaded from commercially cultivating ginseng.

Poaching continues to be a problem, however, and many community members are frustrated that no action has been taken. The poachers persist in their illegal harvesting and will continue to be a problem into the foreseeable future. Beyond the fact that the poachers are breaking laws against both trespassing and poaching and that they are often harvesting out of season, the community's major issue with the poachers, is that they have no long term interest in the land and are harvesting in an unsustainable manner. The harvesting of ginseng and goldenseal involves uprooting the plant, thereby killing it and eliminating chances for reproduction. Most Creekers insist on planting the berries of a plant before harvesting it and only harvesting mature plants, which is in line with Indiana Department of Natural Resources regulations and ensures a future sustainable supply.

The problems with poachers came to a breakpoint in the summer of 2004 when a man was caught in possession of ginseng. It was his second offense. Unfortunately, the DNR did not take action, nor did the Sheriff's Office. In lieu of official enforcement, community members forced the man to repay his ginseng earnings from previous outings and hand over the harvested contraband. Later, the community returned the man's money out of pity. Still a disagreement exists between community members about the vigilante enforcement measures. A divide also seems to exist as to what to do to combat poaching.

Poaching will continue to be a dilemma for May Creek for several reasons. First, the surrounding community often does not see the harvesting of plants or trespassing to be a crime. Even the Indiana DNR, the official agency in charge of illegal harvesting of these plants, is conflicted. The DNR's internal departmental division into a nature preservation group and an enforcement group creates conflicting goals regarding some conservation issues, and, unfortunately, some problems such as ginseng poaching fall between departments. Second, the local population also seems to consider the forests to be "uninhabited" and views them as open access areas, even with fenced borders, unless specifically marked as off-limits. Many of the poachers were raised in the area surrounding May Creek and grew up walking the hills with their parents and grandparents. They see no reason to stop now. Third, many of the people poaching have very little money, and they see ginseng and goldenseal as means of subsistence. The fourth reason, however, is more insidious. Many poachers run a simple cost-benefit analysis on their illegal harvesting practices. The value of ginseng is high, and the probability of getting caught is low. Even if they are caught, the probability of prosecution is also low. Overall, the benefits of poaching greatly exceed the costs. Without impacting this equation, poachers will not stop.

To stop poaching on their property May Creek must overcome several obstacles. To begin, the community makes up a small monitoring group with a large area to cover. There is a high cost to increasing their monitoring coverage. Agrawal and Goyal (2001) refer to this problem for small groups as the "lumpiness of monitoring." In effect, a community's decision to monitor the forest requires a minimum amount of coverage. For monitoring to be effective, the entire forest must be watched at all times. It does little good to hire a guard only part time or for only part of the forest. For the May Creek community, its small size makes monitoring the forest in this manner prohibitively expensive. On top of the challenges of its private monitoring, May Creek must contend with a legal system which does not place a high priority on the poaching of plant products. The community is not helpless however. They can take action to minimize future poaching. The community could post no trespassing signs at frequent intervals along the

property boundaries. This includes placing a prominent sign at the farm entrance. Our walk around the forest perimeter noted that only a few signs were posted on the northwestern part of the property, and the ones that were up were hardly visible. The community might also consider prosecuting future offenders when caught. If the Creekers take these two actions, future poaching is likely to decrease as poachers would look for more accessible land. A third opportunity to reduce poaching is through community outreach. Some Creekers have expressed an interest in becoming community advocates on poaching education. A successful launch of such a community education program may serve to reduce illegal harvesting as well.

Changing Perceptions of Private Ownership Rights

Before commenting on how community members' perceptions of community and private ownership rights have changed, it should be noted that throughout the historical records, interviews, and meetings with community members there remains a consistency in core values throughout the community – the essence of the community that has remained unchanged over time. Across the board, Creekers view the importance of the forest and natural connection with the land to be equaled only by their shared belief in communal living.

However, change is inevitable, and May Creek is no exception. Perceptions about private ownership at the farm have been evolving since the construction of the first buildings began in the late 1970s. As Creekers aged and families grew, the needs of the members changed. With the incorporation of the farm and the division of the farm into shares and mortgageable homesites, private ownership has existed at the farm. At first, change from living communally was slow, and many members continued to eat, share, and live together in the kitchen and community center. Community members even helped in the construction of each other's houses. This too changed, however, with newer generations of houses built by outside contractors and financed with personal mortgages. As Creekers invested more time and money in their private sites, many also grew more conservative in their upholding of individual rights. Over time the community has evolved and experienced increasing heterogeneity of viewpoints about private ownership rights and responsibilities.

Current disparities of viewpoints regarding private ownership rights are evident not only through IFRI interviews, but also by seeing the individual houses. The homes provide a glimpse at the personalities of their owners with different sizes, styles, and placement in the woods. The homes also vary in the size of forest land that has been cleared from around the house. If individuality only shaped housing creativity, the community would be unaffected; but individual viewpoints also differ with respect to the rules governing the May Creek community and these individual homesites. To begin with, not all rules are enforced and not all homesites follow all the rules. Some of this is simply the evolution of communal norms and values over time. The shift from composting commodes to flush toilets, for instance, has been widely accepted without a formal change of rules. Few would regard this evolution of a rule in use as problematic. Other rule modifications, however, are not so broadly accepted, being followed by some and neglected by others. The most notable example concerns the cutting of trees larger than six inches in diameter. The ubiquitously recognized norm suggests that permission of the community should be sought to cut a tree of this size whether it is on communal land or a private homesite. Some Creekers have indicated that they ask before cutting, but others do not. In cases where Creekers

proceed without permission no sanctioning occurs. With no enforcement, the effect to the community is the same as if the entire community's values had shifted and the norm is no longer effective. The ramifications of this norm could significantly impact the conditions of the forests as well as differences between the homesite forests and the community forest.

Examples such as those mentioned, coupled with stories emerging from Creeker interviews, provide insight into the evolution of Creeker's perceptions of private and communal ownership rights and responsibilities. Overwhelmingly, members see their homesites as private property. Their priorities, both financially and physically, logically reside on the homesite. As Creekers age and begin to think about their children's college education and their own future and retirement, their priorities shift more and more to their private homesites and personal financial burdens. More and more attention is devoted towards biological families and is increasingly shifted away from the communal family. Evidence of this can be seen in the community's difficulties in organizing and getting participation for work days and in reaching agreement on community projects such as the community building. It can also be seen in the different perspectives on revenue-generating uses of the land, with some community members interested in exploring low-impact selective logging, maple syrup production, and other revenue sources. Time and age not only impact the perception of private ownership rights through an increased awareness of financial commitments; with greater wisdom and experience many Creekers are now in more demanding and stressful jobs than in the past which require more of their time and energy. It appears that this personal drain leaves relatively little time and effort to invest in community enterprises. While in the past, May Creekers managed both private and communal issues, with less time and energy to spread around now, the communal efforts suffer. This tendency is further reinforced by the challenging times that the community is going through with regards to the studio conflict and the planning of a community building. These are important setbacks that some community members refer to as "knocking the air out of us."

While the underlying values of the community remain consistent, future challenges may present themselves unless the community acknowledges the evolution of member values and the increasing heterogeneity of the community regarding certain issues. Although the core beliefs of the community have stayed consistent over time, the visions of the future of the community vary. May Creek should take steps to ensure that the core beliefs of their community remain sound. The community may also want to examine any current shortcomings of legally binding rules regarding construction and land maintenance on private plots. In the future we should only anticipate that community views on many subjects, including private property rights, will become more disparate.

Defining Conflicts in May Creek's History

As with many planned communities, May Creek has been confronted since its early days. After surviving the early growing pains and financial burdens of a rapidly changing population during the first months after May Creek's founding, one of the first defining conflicts confronted by the community concerned the disagreement over the leasing of land for the location of a radio tower. In this disagreement some community members saw the issue as a means of revenue generation for the community. Others expressed concern over the tower's impact on nature appreciation and privacy. However, the major influence of this conflict was in raising the issue of majority

versus consensus voting which was discussed earlier. More recently, a major conflict in May Creek's history came to an impasse in 2002. The specific dispute revolved around the construction of a jeweler's studio on one of the private homesites. The owners of a neighboring homesite protested the construction of the site due to nature appreciation and privacy concerns, with the conflict reaching its melting point at the October community meeting. From an outsiders' perspective, however, the dispute seems to be about much more than the building of the studio, and the conflict has built upon longer running undercurrents. A more recent issue on the horizon which should be addressed before reaching a similar crossroad relates to the roles of second generation Creekers – how will they be allowed to return to May Creek, will they be given voting rights if they return, will they be viewed as equals with the “adults”, will they require additional homesites or will they be allowed to build additional buildings on existing homesites? This report will not go into explicit details about these conflicts nor will it seek to provide specific resolutions as the IFRI research team is not trained at mediation and was not witness to any of the events in question. Instead this report seeks to unravel the institutional successes and failures of the community in working through these particular conflicts, and in the process seek to understand the learning experiences that the community has gained in confronting these trials. Suggestions on institutional modifications to prevent or manage future conflicts will also be made.

The radio tower conflict first confronted the problems arising from a lack of clear rules. While it is impossible to craft completely transparent rules, the community's various definitions of consensus and the misunderstandings about whether decisions would be made based on majority or consensus have led to some troubling consequences as discussed earlier in the section on rules in form. This conflict was only resolved through lengthy discussions with the entire community on the issues, a resolve to use unanimity to decide on the issue, and everyone being clear about the rules used and their willingness to live with the decisions of the community. Current efforts to revise the rules and regulations and clarify details such as the voting requirements show the community's efforts to remedy past problems and avoid future confrontations such as the radio tower conflict.

In the ongoing conflict over the jeweler's studio, specific rule modifications regarding the particulars of this situation may not accomplish a great deal as the building of the studio was a one-time event and rule changes regarding the building do not address any of the original sources of the conflict. The root causes of the conflict can be addressed, both formally and casually. To begin, fundamental differences exist in the community regarding nature appreciation from the forest. While the community's belief system is based upon the forest of May Creek and a common appreciation of nature, this appreciation means different things to different members. Some view nature appreciation as using the forest to take walks and rejuvenate the spirit. Others view the forest as a source of closely guarded privacy. Some view each tree as important, with even the cutting of dead trees having an impact on the natural progression of the forest. Others see active management, consumptive use, and selective logging as compatible with forest health. As mentioned earlier, community members disagree on where the breakdown between communal and private ownership rights exists, specifically regarding forest usage and the cutting of trees. These issues point to increasing levels of heterogeneity in the community. Again, the differences within the community are contained in a narrow range when compared with the rest of society, but these differences may still lead to challenges for the community.

While no institutional mechanism can or should be used to eliminate differences of opinion and there is no such thing as an ideal institution, conflict leading from these differences can be mitigated by clearly outlining specific communal and private rights and responsibilities. In addition, rules should be enforced with graduated sanctions spelled out. If the community requires permission to cut live trees on private homesites, the community should use its rules to see that this happens. Care must be taken to ensure that private and communal rights are balanced, so one does not unintentionally affect the other negatively. Overriding all of these suggestions is the need to foster an open environment with clear channels of communication. It is quite clear from participation in community and council meetings that the community generally encourages open communication and active listening. In recent conflicts, however, it appears that communication channels closed, with contradictory views missed. To elaborate on this, compare the resolution of the radio tower with that of the jeweler's studio. With the radio tower, a compromise emerged only through lengthy discussions with respect for diverse opinions. On this important issue, the community resorted to unanimity to reach a decision. Contrast this resolution with the studio conflict where communication channels broke down and decisions were made without full disclosure. This dispute occurred at roughly the same time that the rule clarification process was being clarified. As a result, the way forward was obscured. With no directly accountable person responsible for the resolution of this case, the result of the breakdown in communications was the fracturing of the community.

A new opportunity to experiment with some of these new suggestions is emerging with the challenges of the second generation. An open discussion to clarify the community's hopes and desires for the second generation would be a good beginning. An open invitation to second generation Creekers in the area to hear their views and concerns about the community would also help to foster open dialogue. If May Creek is serious about revitalizing their community through the second generation, the hopes, concerns, and goals of both the elder generation and the second generation should be shared. From this engendered dialogue, positive steps can be taken before potential conflicts emerge in the future while there is still time to resolve issues amicably.

FOREST ANALYSIS

The forest analysis section is presented in three parts. First, information describing forest quality and condition is provided through a review of forest data analysis. Second, forest resources and their uses are described, including the users of the forest at May Creek Farm (MCF) and the forest products used by each user group. Finally, results from our examination of the institutions that govern the relationships between MCF users, forest management, and the uses of the forest are reported.

The objective of this report is to provide useful information for future IFRI researchers, other professionals conducting this type of research, and May Creek community members. Data collected using the methods described above, are presented to understand the forest conditions at May Creek. In 2000, the IFRI team members decided that a useful separation could be made between forest on homesite lots (i.e. homesite forest) and forest on community owned lands (i.e. May Creek forest). Therefore, the following information will not only compare forest data for visits in 1996, 2000, and 2004, but also between the homesite forest and May Creek forest.

Forest Quality and Condition

Current measurements of the May Creek and homesite forests indicate that conditions in these forests are typical of similar forests found in the region. Stem density (trees per hectare) is a measure often used to describe the age or developmental stage of a forest (Avery and Burkhart 1994). Younger forests will have a higher number of smaller diameter trees while older, maturing forests will contain fewer trees but those trees will be of a larger diameter. Figure 6 demonstrates a density distribution typical of a healthy maturing forest. The reverse-J-shaped curve indicates that there are many small diameter trees and fewer large trees. Comparison between forests indicates that the May Creek forest contains a greater number of smaller diameter stems, suggesting that it is a younger forest than the homesite forest (see Figure 6). However, difference in stem density between forests was not found to be statistically significant (Mann-Whitney Wilcoxon $p = 0.911$).

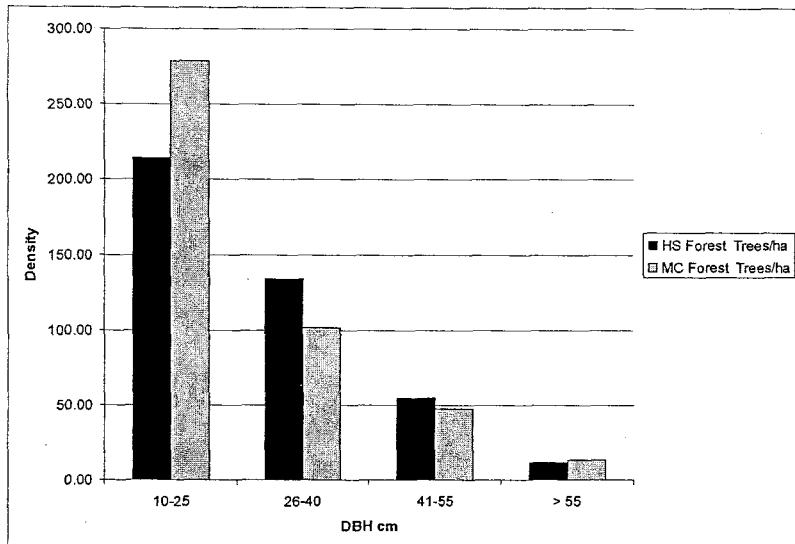


Figure 6: Density (trees per hectare), 2004

Overall density is dominated by three main tree species, yellow poplar (*Liriodendron tulipifera*), sugar maple (*Acer saccharum*), and eastern red cedar (*Juniperus virginiana*). Given the elected forest management regime of allowing nature to manage the forest, it is likely that over the next several years, yellow poplar and sugar maple will continue to represent a large proportion of trees in this forest, while the presence of eastern red cedars and oak species will dissipate over time.

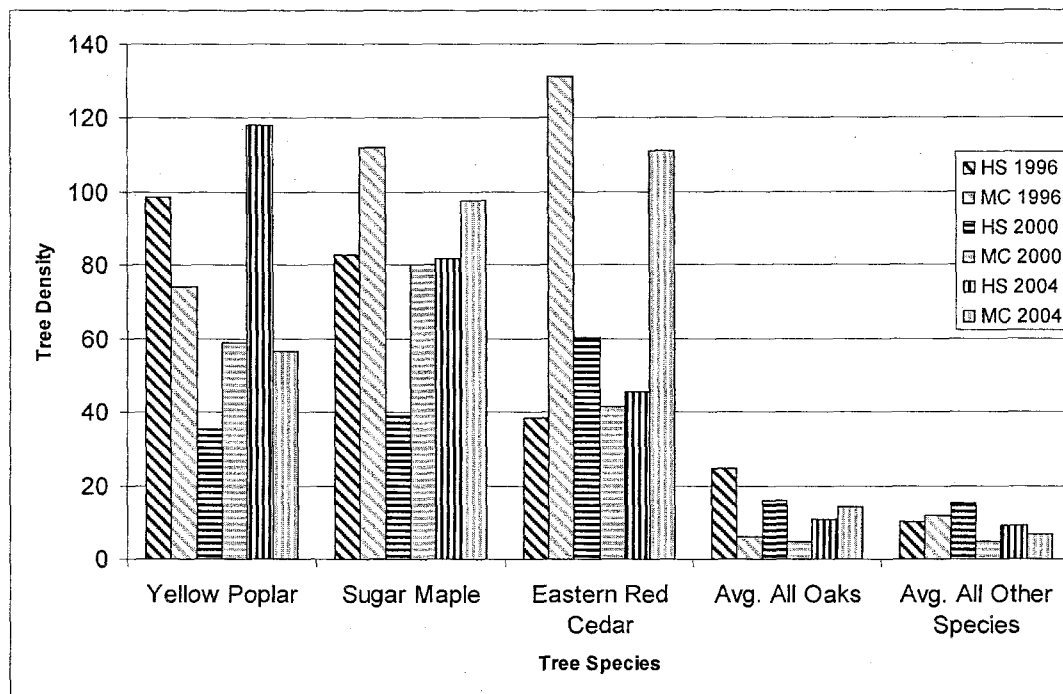


Figure 7: Tree density per hectare reported by prominent species group

Comparisons of data between 1996 and 2004 indicate that forest conditions at May Creek have remained stable. Non-parametric statistical tests (Mann-Whitney Wilcoxon) reveals that there is no significant difference in basal area ($p = 0.442$), number of stems per plot ($z = 0.158$), or number of stems per hectare ($p = 0.099$) between 1996 and 2004. With the low-impact sampling method used by IFRI, these results can be expected in forest that has not been harvested in a major fashion. Figures 7, 8, 11 and Table 3 offer comparisons between homesite and May Creek forests as well as all years of IFRI visits.

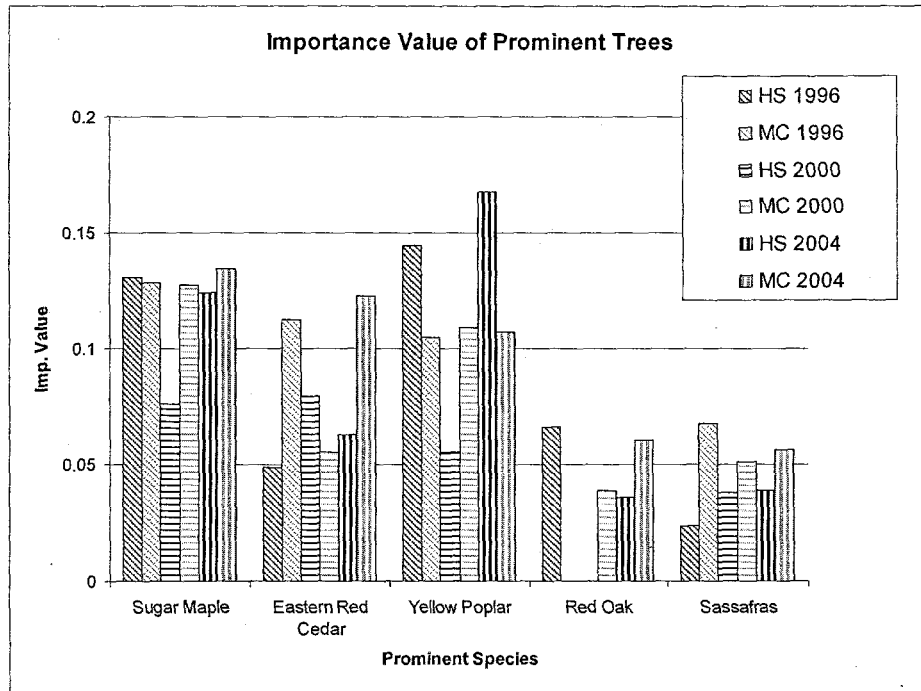


Figure 8: Importance value of prominent species recorded during all IFRI visits to May Creek Farm

Importance value is an index derived by examining the density, dominance, and frequency of each species in the forest (Cox, 1990). Figure 8 shows the importance value of prominent species at MCF as indicated through data collected over three IFRI visits. Importance values for all species recorded in 2004 are also presented in Figure 9.

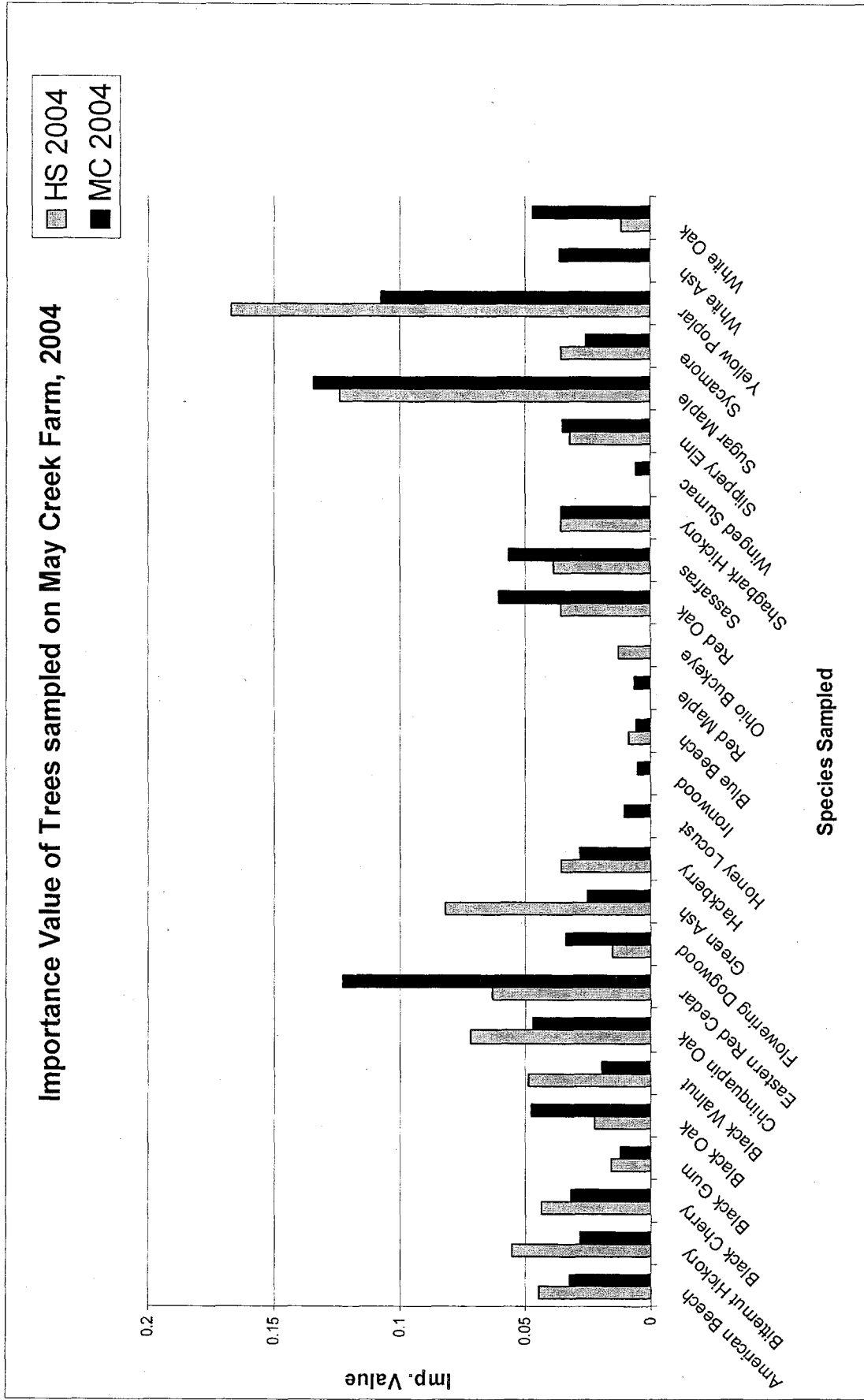


Figure 9: Importance value of all trees recorded on May Creek Farm, 2004

Species composition can reveal a great deal of information about the age and condition of a forest. The high importance value of sugar maple and yellow poplar is indicative of a maturing forest where timber management is absent. It is likely that under the current management strategy (i.e. no management) these two species will continue to increase their importance within the forest, replacing oak and hickory species as well as the large eastern red cedar component. The strong eastern red cedar component is indicative of (relatively) recent disturbance. Most cedars are likely remnant of the area clearing that occurred in the late 1930s. Because cedars are pioneer species and require direct sunlight and open growing conditions, it is likely that the importance value of eastern red cedar will decline over time.

Examination of sapling structure indicates that the majority of saplings recorded are shade-tolerant species. The relatively low number of oak and yellow poplar saplings may indicate that these forests are approaching a successional climax composition barring any disturbance (see Figures 10 and 11).

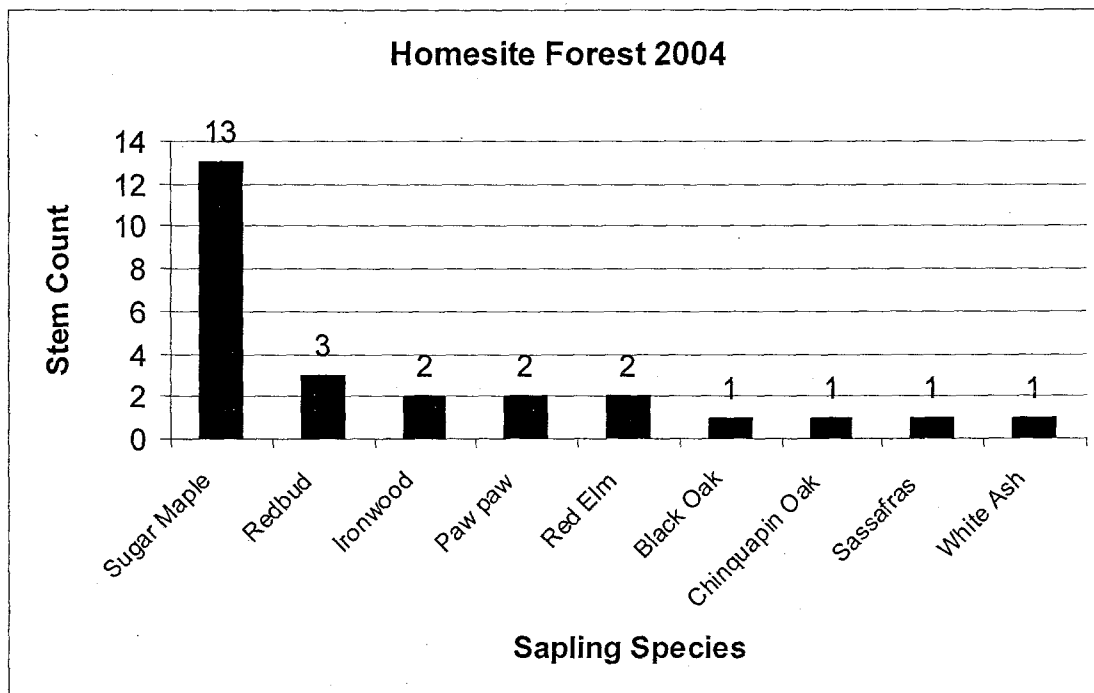


Figure 10: Saplings recorded for Homesite Forest, 2004

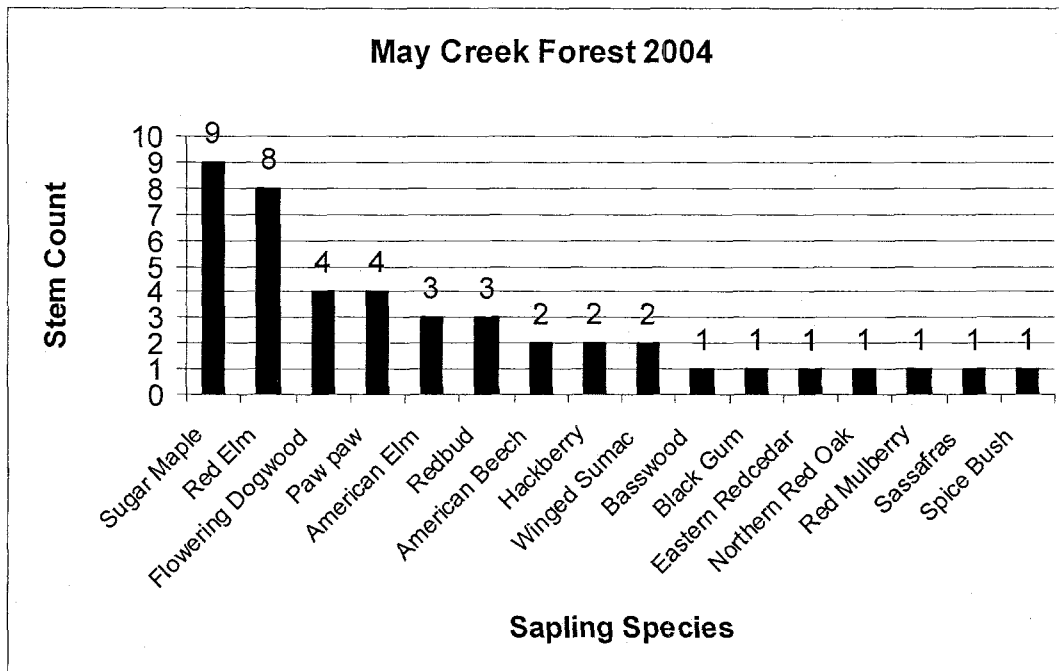


Figure 11: Saplings recorded for May Creek Forest, 2004

A broad comparison between forests and site visits is presented in Table 3, where collected data indicates that the number of saplings sampled is decreasing over time in each forest. The anomaly present in the 2000 homesite forest data is likely a result of the small number of data points sampled in that year. The overall decline in the number of saplings is likely the result of a closing canopy, natural for a maturing forest (Barnes et al. 1998). The increase in tree species richness for homesite forest in 2004 is likely the result of the largest sample size this forest has undergone. While Table 3 indicates a change in density (trees/ha) is present over time, this change has not been statistically significant. From this table average DBH and basal area appear to be relatively stable and in fact have not significantly changed over time.

| | <i>Homesite Forest</i> | | | <i>May Creek Forest</i> | | |
|---|------------------------|-------|-------|-------------------------|-------|-------|
| | 1996 | 2000 | 2004 | 1996 | 2000 | 2004 |
| Plots | 11 | 9 | 14 | 26 | 25 | 31 |
| Sapling Species Richness ¹ | 11 | 14 | 9 | 15 | 16 | 16 |
| Tree Species Richness ¹ | 20 | 20 | 23 | 25 | 38 | 27 |
| Saplings/ha | 814 | 1101 | 657 | 956 | 721 | 502 |
| Trees/ha | 414 | 396 | 414 | 512 | 371 | 440 |
| Average DBH (in CM) | 22 | 23 | 26 | 23 | 26 | 25 |
| Average Basal Area (m ² /ha) | 0.052 | 0.058 | 0.066 | 0.052 | 0.069 | 0.064 |

¹ Total number of species sampled.

Table 3: May Creek and Homesite Forest Analysis for IFRI Visits

Analyses comparing forests at May Creek and years of IFRI visits indicate that there is no statistically significant change in tree density. However, Figure 12 shows a visible trend in the data suggesting that the number of trees in smaller diameter classes (left) are decreasing, while stem counts of larger diameter classes (right) are on the rise.

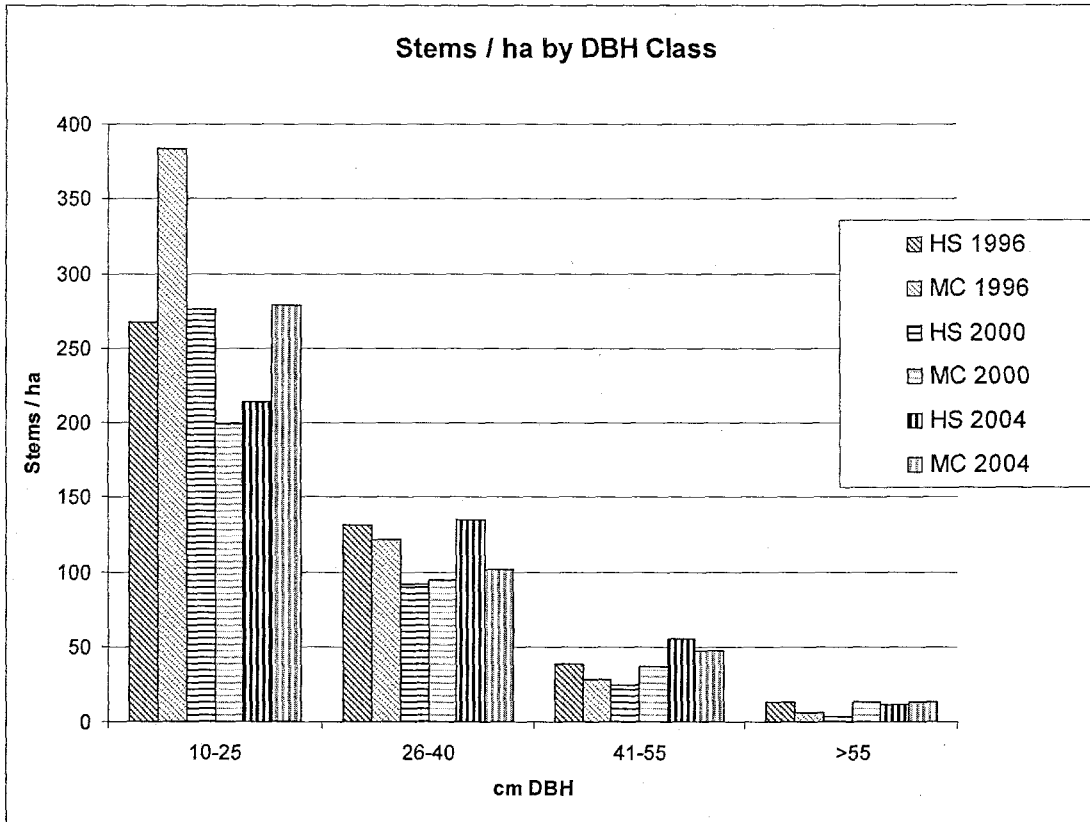


Figure 12: Trees per acre for all IFRI visits, Homesite and May Creek forests, reported by diameter class

Fundamental to the principles of IFRI, this analysis aims to understand the inhabitants of May Creek and their forests. Human impact has been represented in this analysis indirectly by providing information about the forest composition resulting from the very limited use and management of forests on May Creek property. However, we seek to understand the impact that residents living within the forest have on forest composition. This question is answered by overlaying forest composition data over home density and distance from the road that runs throughout May Creek Farm.

Figure 13 represents the range of home density (houses per hectare) across the MCF landscape, the locations of forest data collection plots in 2004, and the May Creek road. The darker blue color represents greater density and red represents areas of lower density. Because of the small number of houses on MCF all values are less than one. To analyze the possible relationship between forest condition and the forest's distance from roads and between forest condition and home density, the research team carried out a correlation test. We found that the only relationship that was even slightly significant was between basal area and house density ($p=0.075$). The correlation coefficient was negative, which means that the higher the home

density the lower basal area. It is interesting to note that one of the most commonly used predictors of forest conditions—the distance to roads—does not appear to have a systematic effect on forest conditions at May Creek. This result confirms the earlier observation that Creekers make very limited consumptive use of their forest.

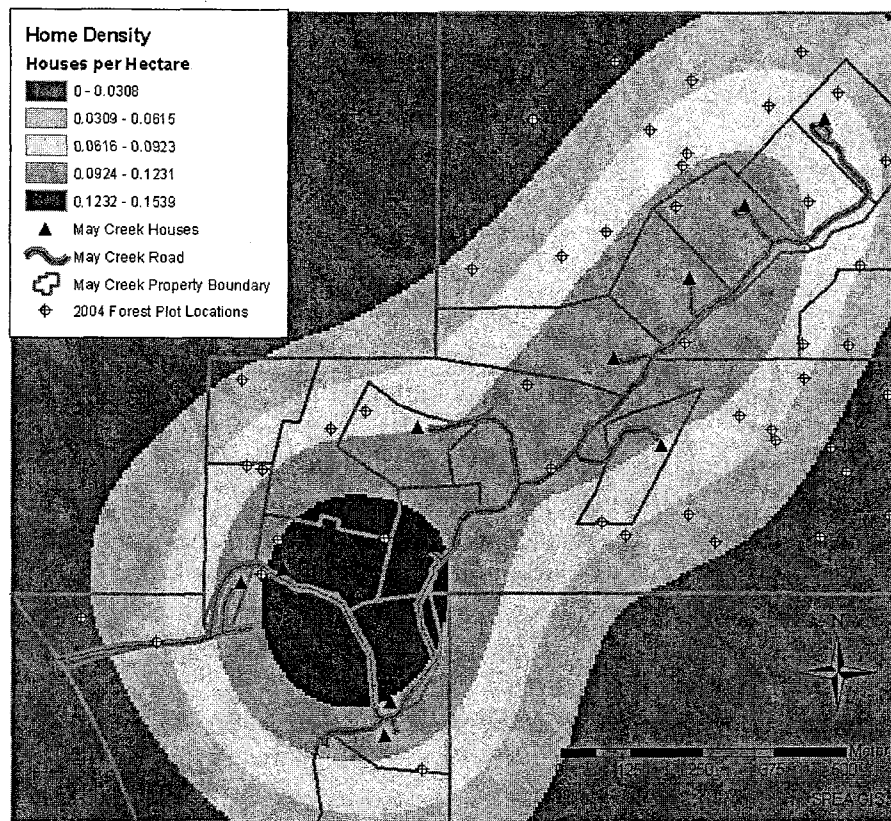


Figure 13: Home density (overlay of houses, May Creek Road, and the 2004 forest plots)

Topographic variation can play an important role in forest composition across a landscape. Two spatial variants are examined: elevation in meters; and aspect, or facing direction of each hillside. A Pearson’s correlation was then run comparing forest composition to the topographic features. Statistically significant relationships were found to exist between forest composition and aspect.

The distribution of elevation among all lands on MCF is indicated in Figure 14. The majority of land area (i.e. 52 percent) at MCF is within the lowest of the three elevation classes. Generally, it is accepted that lower elevations contain more moisture and better growing conditions for most trees and plants. However, it is generally lower value tree species that compete well on moist sites (i.e., maple species and American beech - *Fagus americana*). An exception to this general rule is the black walnut (*Juglans nigra*), which performs very well on wetter sites and maintains one of the highest timber values in the region.

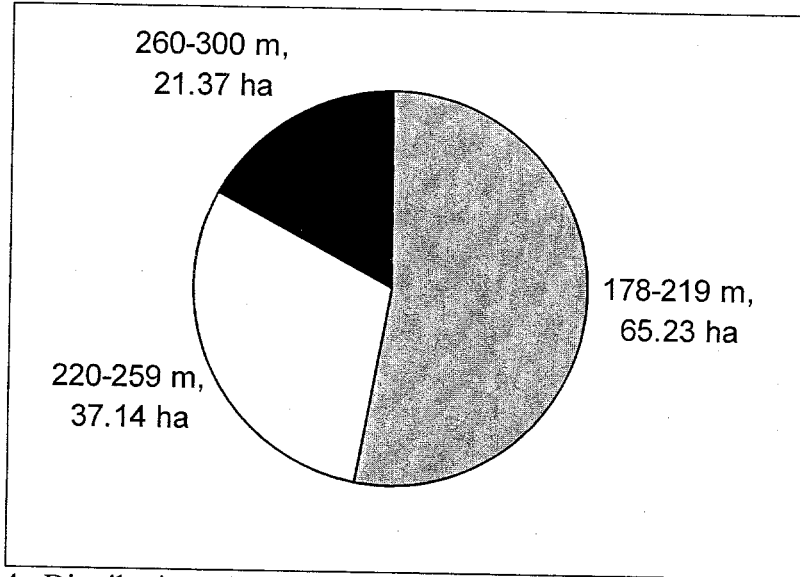


Figure 14: Distribution of May Creek and Homesite Forests by Elevation Class

Aspect also impacts soil moisture availability due to direct sun light and time of the day during exposure. North and eastern slopes, considered the wettest sites, receive the least amount of direct sun or receive sun during the coolest part of the day. South and southwest slopes are the opposite, receiving direct sun most of the day and into the late afternoon when temperatures are highest. Like elevation, certain species will be found on aspects facing certain directions. Mesic or moisture loving species including sugar maple, American beech, and yellow poplar are generally found on north and northeastern slopes. The greatest proportion (39 percent) of forest land at May Creek has a north-northeast aspect. East-southeast aspect is the second most common aspect (28 percent), followed by west-northwest (20 percent), and finally south-southwest (13 percent) (Figure 15).

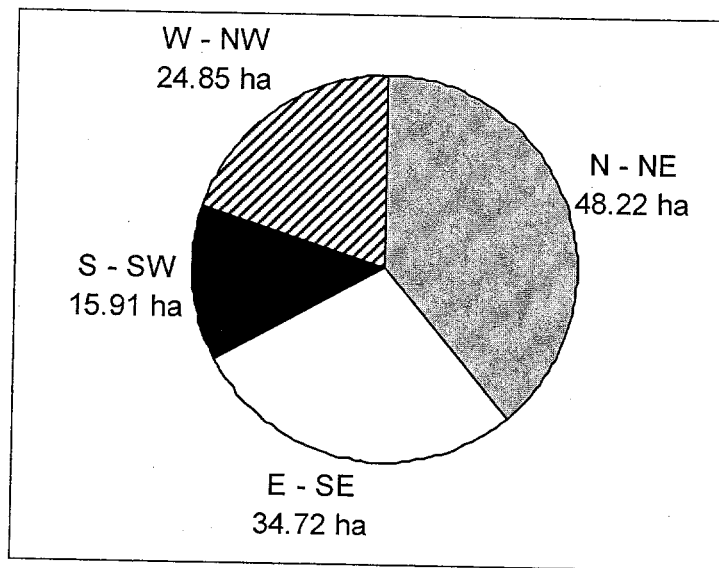


Figure 15: Distribution of May Creek and Homesite Forests by Aspect

Consideration of select forest values by aspect reveals that average dbh and height are greater on northeast and southeast aspects (Figure 16). These results indicate that there is a positive relationship between aspect, and forest composition. Statistical analysis confirms this assumption with significant correlations between aspect and basal area ($p < 0.006$).

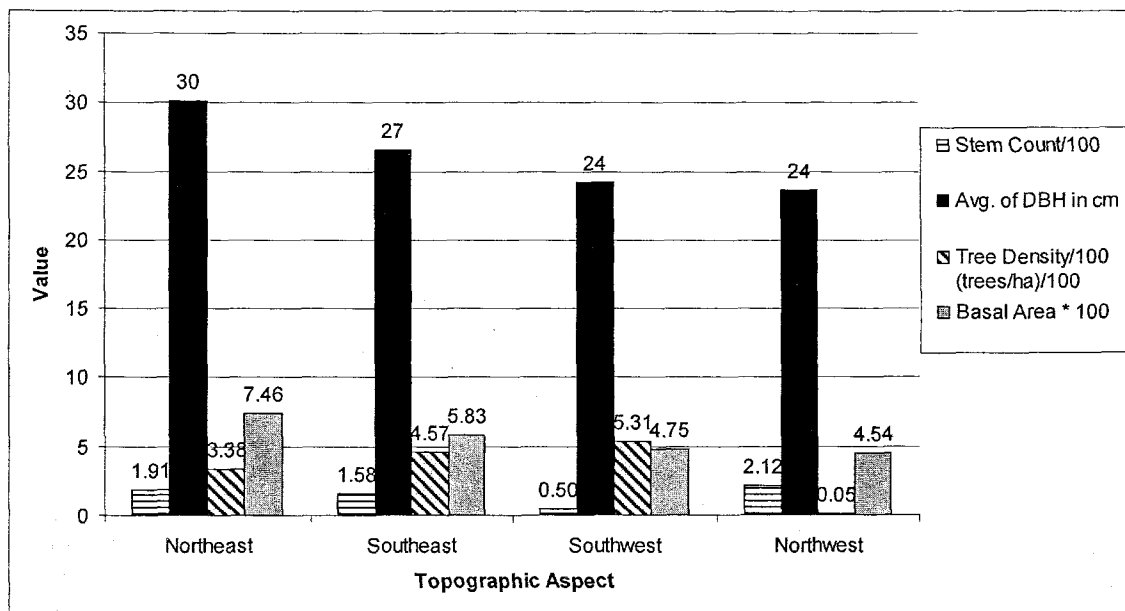


Figure 16: Select Forest Values by Aspect, 2004

Forest Resources and Their Uses

Users of the forests at May Creek include all property shareholders (living on and off site), friends and neighbors invited to May Creek, and poachers who illegally enter May Creek Farm property to extract forest products. Due to the very extensive use of the forest, use has a limited impact on forest composition or health. Interaction between May Creek forest users and the forest has increased the welfare of both.

Consumptive Uses

While users of the May Creek and homesite forests do not exercise standard extractive practices related to timber harvesting, several products are periodically harvested from the forest (Table 4). Wood is cut by community members (often with community cooperation) from dead or fallen trees for the purpose of providing individuals with fuelwood for home heating. Occasionally, parts of fallen trees are used for construction or decoration. Fallen leaves are collected on homesites for composting. Stones found in the forest are collected and displayed for ornamental purposes on some homesites. Most households have constructed a well for providing water to their home. Two houses share a well, one house uses a cistern and the other eight homes have their own well. Ginseng and goldenseal, which are relatively abundant at May Creek have been collected and used for personal consumption by several members of the community. Morel

mushrooms are collected in the spring by community members and friends for personal consumption.

| <i>Product</i> | <i>Collection Activity</i> | <i>Uses</i> |
|-------------------------|--|--|
| Trees | Cut deadwood only | Fuelwood and ornamental construction |
| Leaves on Ground | Collected and composted | Adding to gardens |
| Stones | Collected from the forest | Ornamental and minor construction |
| Water | Collected through well construction | Water for home sanitation |
| Areas of Sacred Worship | Designated through experience | Self realization and meditation |
| Recreation | Roads, trails, and forest travel | Walking, jogging, hiking, nature observation |
| Herbaceous Plants | Ginseng and goldenseal collected from the forest | Sold as source of income |
| Morel Mushrooms | Collected from the forest | Eaten and shared |

Table 4: Forest Products Collected by Users at May Creek Farm

Non-consumptive Uses

The majority of the forest users at May Creek reported non-consumptive uses as most important. Limestone outcroppings, and two ephemeral streams on the property augment the forest and provide community members with opportunities for outdoor enjoyment. Non-consumptive benefits include recreation, privacy, nature appreciation, religious practice, feelings of solitude, and personal meditation. May Creek residents also felt that the forest presents a valuable opportunity for educating adults and children through experiences and close interaction with nature.

Forest History and Management

The May Creek and homesite forests represent a variety of successional stages in the development of locally native closed canopy forests. Historical records consistent with forest landscape development indicate that the area of May Creek Farm was heavily harvested for timber in the 1930s. On site and historic evidence concurs with resident perceptions that following the major timber harvest in the 1930s, the forest has regenerated naturally and is approaching maturity as a mixed hardwood stand with tree diversity and quality typical of the southern Indiana region.

In the early 1980s the forest at May Creek Farm was divided into 16 individual homesites and one communally owned property. Homesite properties occupy a summed area of just under 100 acres. Communally owned lands are represented by the May Creek forest, covering 178 acres, and the open land area in the southwest corner of the property (approximately 28 acres).

In 1992, forested lands (excluding homesites and the open field) on May Creek Farm were entered into the Indiana Department of Natural Resources' (DNR) *Classified Forest* program (Indiana Forest Classification Act I.C. 6-1.1-6). This program, established by the DNR to encourage forest conservation within Indiana, provides incentives to private forest owners through property tax reduction, and professional forest management assistance. Requirements of the landowner include the development of a DNR approved forest management plan, the prevention of grazing and/or fire on forested lands, and the posting "Classified Forest" signs, provided by the DNR. The DNR is not explicit about the definition of planned management, however, and personal communication with Monroe County District Forester Ralph Unversaw (2004) revealed that the May Creek Farm plan was for no management.⁴ Information obtained through interviews with residents suggests that most members are aware of the program, and the fact that Classified Forest status provides a property tax break, however, no one could provide specific information about the program (i.e., what year the land came under the designation, how much of the land was under designation, and the location of the management plan which is required by the DNR).

One of the greatest debates concerning temperate hardwood forests is the issue of actively managing oak-hickory forests versus allowing the natural climax of maple-beech to take place. An oak-hickory forest requires a disturbance to perpetuate growth in the forest, due to physiological differences in the shade tolerance between oak-hickory and maple-beech. Maple and beech species are physically capable of generating adequate maintenance energy from leaves and branches in shady conditions. Shade tolerant trees therefore maintain a greater number of lateral branches located lower in the forest canopy. This catch-22 of forest ecology means that once a forest has moved into this climax stage of succession, changing that stage becomes very difficult, barring intensive management practices including cutting, burning, and replanting. Proponents of oak-hickory claim that prior to European settlement Native Americans used prescribed burning regularly to maintain oak-hickory forests, and that forest management should be used to maintain the native oak-hickory landscape. Secondly, it has been argued that oak acorns and hickory nuts provide greater mast for forest wildlife, and therefore promote greater animal biological diversity. From an economic standpoint, oak-hickory timber far exceeds the value of maple or beech. More valuable timber can mean more jobs and expanded economic activity.

Barring disturbance, maple-beech is the climax successional stage for forests of this region. Proponents of non-active forest management often cite loss of visual quality, destruction of wildlife habitat, and water quality degradation as reasons for not cutting in regional forests.

⁴ Unversaw, Ralph. 2004. Personal communication. Contact information: Ralph A. Unversaw. District Forester. RR 4 Box 214. Spencer, IN 47460. (812) 829-2462.

INSTITUTIONS GOVERNING FOREST RESOURCE USE

Conservation of the forest was one of the founding principles when May Creek was established in 1976. This conservation ideal is reflected in the by-laws and Rules and Regulations which restrict forest wood usage to the collection of deadwood. The Rules and Regulations state that timber may not be cleared or sold without approval of the council. In addition, there seems to be an unwritten rule that Creekers must ask the community's permission to cut any live tree larger than six inches in diameter. Even today, Creekers cite forest conservation as one of the core values that is ubiquitous in the community. May Creek's transfer of values into practice has been effective in conserving the forest. The classified images of land cover (see Annex A) of the May Creek area clearly shows that the forest cover on May Creek land has increased since the Creekers bought the land. Comparisons from previous years also show that the tree density and tree size (diameter at breast height) has continued to increase.

The apparent unanimity in the conservation value hides the heterogeneity of views on forest management in the community. The status quo has been to have a 'hands-off' management approach where the community lets "nature take its course," whatever that might be. Throughout the past 28 years, there have been Creekers who have wanted to implement a more active forest management plan, but there has never been enough support to change the status quo. Many Creekers prefer some tree species over others, such as hardwoods like oak and hickory, while others Creekers just like to have a forest regardless of the species composition. Creekers have expressed their fondness of many of the cedar groves, especially one near the waterfall that was considered to be a spiritual place, and it was brought up at a meeting once that if the grove is not managed, the cedars will disappear. No action has been taken and today the cedars are dying because they are being shaded out by poplars and other tree species. The current forest composition shows a dominance of poplar, maple, and cedar trees, though it appears that the cedar trees are being reduced in number as the poplar and maple becomes more predominant. The poplar and maple are also replacing the oak trees since the former species saplings are more shade tolerant (see Forest Analysis section for a more detailed discussion of this topic). The evaluation of this forest tree composition trajectory depends on the preferences of the residents. For Creekers who want to promote hardwoods and cedars, the data indicate that the current forest management is not achieving this goal. However, for Creekers who are not concerned with forest tree composition, the data show a healthy, maturing forest.

There have been a few attempts at forest management. At one point, a few Creekers tried girdling some of the less desirable tree species; however, this practice was not maintained. In 1991, Creekers discussed forest management approaches with a Department of Natural Resources employee. He had three main suggestions to improve the hardwood stands and preserve cedar groves: 1) to cut grape vines, 2) to cut large trees that are shading out and thereby killing cedar trees, and 3) to thin smaller trees from overcrowded areas to decrease the threat of tree diseases and provide more nutrients and sunlight to desired hardwood species. There has been no evidence that any of these recommendations were implemented even though many Creekers wanted to preserve cedars and encourage hardwoods.

From the follow-up interview conducted via email (10 of 15 shareholders responded), five shareholders do not want to have an active forest management plan as they are not concerned

about the current successional trajectory. Three Creekers responded that they would like to have a forest management plan to encourage some species over others and two Creekers didn't know how to respond since they had never given the issue much thought. Aside from these differing views of forest management, other factors are likely to delay and prevent an active forest management plan right now; namely the limited financial resources and lack of available time to devote to the implementation of such a management plan.

An issue that complicates forest management is whether or not the community should use the forest as a source of income for the community. When May Creek was in its infancy, many members wanted to have a community business and several were attempted, from home construction to tofu making to house cleaning. Though some of the businesses were initially successful, none continued for more than a couple years. Since that time, more than 20 years ago, there have been few efforts to create community income. There was an opportunity in the 1990s to rent land to a local radio station for a tower, but after much discussion, and even with a majority of community support, this plan was eventually tabled due to lack of unanimity.

The May Creek community is divided on the issue of using the forest for community income, in an extractive or non-extractive manner. Some members feel that the forest should be seen as a resource that could be "consciously" used to provide income for community projects such as a community building. Other members prefer not to use the forest for income and want to keep it as a strict conservation area. In the follow-up interview, five Creekers said that they would like to explore either extractive or non-extractive uses of the forest, and the other four said they would not oppose some forest uses even though they personally would not be involved. A few Creekers did mention some limitations about what they consider appropriate use of the forest. One Creeker specifically said that s/he would not support logging and two other Creekers said they would not support leasing forest land. The idea of community income has not been discussed recently and does not seem to be on the agenda in the near future even though many Creekers think about the possibilities often.

DISCUSSION AND IMPLICATIONS

The reflections in this discussion section are from outside observers perspectives which we hope will be useful as a basis for future discussions within May Creek. Before discussing various community characteristics that could affect the May Creek forest, it is necessary to acknowledge the impact that May Creek has had in preserving forest land. Even though reforestation was in progress when May Creek purchased the land, there is no guarantee that the land would have continued to be forested now if it was not owned by May Creek. Over the past 28 years, forest cover has continued to increase and that is an unquestionable achievement. It is difficult to postulate what will happen to the May Creek forest in the future, but in this discussion section, we explore some characteristics of May Creek which could affect the forest, either positively or negatively.

Community in transition

As is true in life, change has been inevitable at May Creek. The May Creek community is constantly in transition as the individuals and families are also in transition. One of the biggest

changes that occurred at May Creek, that has affected how the community operates today, happened over 20 years ago. Initially, May Creek was built on the ideal of communal living with individuals sharing housing, cooking, childcare, jobs, and most of the daily activities. Most of these activities took place in the pasture area, with the forest being largely unused. Around 1980, community life began to change significantly as more people built private homes, the community building burned down, community enterprises closed, more children were born, and members sought jobs and careers beyond May Creek. These events began the shift from a more communal lifestyle to a more individual or family oriented lifestyle. With the change in orientation, families built their own houses and the road into the forest was extended further and further. The clearing of forest for family homes and roads is the most extensive logging that has occurred at May Creek. This expansion into the forest increased accessibility to the forest and exposed it to more exploitation by Creekers and poachers.

Currently, Creekers are undergoing a different transition as the children are mostly college age and have moved away. Many Creekers expect their children to return to May Creek and there is at least one family that would like to build a second house on their homesite for a second generation Creeker. If more houses were built on May Creek land and more families moved onto May Creek land, use of the forest would undoubtedly increase. Since the primary uses of May Creek forests are for nature appreciation and fuelwood, the impact of new households could be minimal. As most Creekers are now in their 50s, the next big transition that is looming around the corner is retirement. It is unknown the effect that retirement will have on the community, but several Creekers are hoping that with retirement, the level of participation will rise and revenue generating activities associated with using the land and forest will evolve. A shift to full time residence and work on May Creek could increase forest use, especially if income generating activities associated with extractive or non-extractive uses of the forest are involved.

Participation

The main form of community action is through community organized workdays where Creekers gather to work together on a particular task. Some of these workdays are devoted to forest related work such as clearing tree branches and undergrowth from the vicinity of electricity lines, harvesting dead wood for fuelwood, and clearing roads and paths of fallen or obstructive vegetation. It has been reported that in the past workdays (and meetings) were better attended than they are now and there is concern among Creekers about declining participation. Though there are many explanations to the decline in participation, it seems that the second generation is involved. The population of May Creek has been reduced by about a third with the departure of the children, which seems to have affected the amount and perception of participation. Without adequate participation in the future, it might be difficult for May Creek to complete its current level of basic forest maintenance, much less a more comprehensive forest management plan.

Decision-Making

Currently, May Creek is facing several organizational and institutional problems that are affecting the decision-making process. In 2001, May Creek invited a facilitator to hold a one day workshop to try to clarify and unify the mission, values, and rules of May Creek. After this workshop, May Creek instituted a few changes to the organizational structure of the community.

As explained in the results section above, it was decided that there should be two meetings every month: a community meeting and a council meeting the following day. Though this reorganization seemed to be well received initially, it also seems to have generated some ambiguity about the decision-making process. From an outsider's perspective, there seems to be quite a bit of redundancy in the current process as topics are first discussed at the community meetings and votes are tallied, only to be re-discussed and re-voted on at the council meeting the following day. It seems that the cart is being put before the horse as non-binding decisions are being made at the community meeting only to be rejected the next day when the logistics are considered at the council meeting. In effect, the increase in decision-making powers for the council seems to have occurred at the expense of the general community meeting. This raises the question whether the debilitated position of the general community meeting has anything to do with the lower rates of participation at those meetings. Do community members, who are not part of the council, feel less motivated to participate in community meetings under the new order of things?

In addition there does not appear to be a clear leader in the community guiding community discussions and actions. May Creek was not founded by a charismatic or religious leader, but instead by a community that wanted a particular lifestyle and held certain core values. The community has always strived to be egalitarian with no particular person (or people) leading the rest. As a result, Creekers identify various individuals as being the de facto leaders, everyone equally being a leader, or the council as being the temporary group of leaders. The roles of the president and vice-president, as defined in the by-laws do not clearly designate leadership roles for community or council meetings and subsequently, the council does not always act as a leader in terms of guiding the community in raising and dealing with issues. This ambiguity in leadership likely contributes to the lengthy decision-making process which affects the community and the forest.

These problems with decision-making have and will continue to affect the May Creek forest, both positively and negatively. With the current decision-making process, it is likely that "let nature take its course" will be the de facto forest management plan for some time. Making decisions about forest management are also hampered by the split in the community over forest based income generating activities. Though the core value of conservation of the forest is shared by all Creekers, the interpretation of this value varies greatly. Some Creekers want to keep the forest as a strict conservation area while others would like to conscientiously and sustainably use the forest for community income generation, either through extractive or non-extractive means. A strong leader will be needed to guide the community through the difficult process of deciding upon the appropriate rules and regulations for a forest management plan, whatever form it might take, to help prevent divisive conflicts within the community.

Intergenerational Issues

There is great hope and expectation that the second generation will revive the communal aspect of the community. A great deal of emphasis was placed on their future participation, infused with enthusiasm and energy to complete projects as a community for the community. Most Creekers expect that eventually their children will return to May Creek to live. The second

generation has been a vital part of the community and the friendships among the second generation, while living at May Creek, gave Creekers perhaps a greater sense of community that is absent with the children gone. When living at May Creek, the children were always active in the community, attending some meetings, participating in workdays, and attending social gatherings.

Second generation Creekers that we spoke with felt very fortunate that they had the experience of growing up at May Creek. They grew up appreciating and observing the forest and still have a very strong connection to the land. Some second generation Creekers felt growing up with the May Creek community meant that they had a large support network and were treated as adults. However, one of the complaints that second generation Creekers have now is that they are not treated like adults when it comes to community decision-making. They do not have a role in the community and are not allowed to vote on community decisions, even if they are the only representative of their family living on the property. Even though the first generation wants the second generation to continue the community, the second generation feels that they are treated like kids and not as the future leaders of the community. Even with these complaints, many second generation Creekers would like to continue their involvement in the community. Though very few of them would (currently) like to live at May Creek full time, many of them envision creating summer or weekend houses at May Creek. It is impossible to predict how the transfer of property from the first to the second generation will change the community structure, institutions, and forest use; but it is a critical issue to keep in mind during subsequent research at May Creek.

Community versus subdivision

A distinction that has surfaced several times during our research at May Creek is the difference between an intentional community and a suburban subdivision. From the comments that Creekers have made, it is apparent that Creekers have varying ideas about what comprises an intentional community and what comprises a subdivision. Some Creekers have commented that since Creekers own land together, have a strong community bond, and have a common value system then May Creek is a community and not a neighborhood or subdivision. Other Creekers have mentioned that lack of participation, no communal enterprises, and a lack of a strong community or unified vision suggest that May Creek is becoming more like a subdivision. This distinction is very subjective, but the different views in the community highlight the varying community visions. It is also possible that outside forces will impact how May Creek views itself. With logging on adjacent lands, the threat of a highway three miles away, decreased privacy, and subdivisions for towns continually spreading out, Creekers may change how they view themselves: with either a stronger or weaker community identity. Some second generation Creekers are dismayed that there was no community outcry or action when neighboring land started to be logged and viewed this as a sign of change away from community as well as apathy towards forest conservation. These varying views of the structure of May Creek could potentially affect the forests since one of the core principles that May Creek was founded on was preservation and conservation of the forest. A change in community vision could change the rules that govern forest use and thereby impact the forest, for better or for worse.

CONCLUSION

The May Creek and homesite forests at May Creek continue to be healthy second growth forests. Though the sapling density has decreased for both forests, the tree density has increased since the 2000 fieldwork. The number of larger trees is slowly increasing as well, indicating that the forest is maturing. Additionally, the sapling and tree species richness remains high for a maturing Indiana forest. These forest conditions are not surprising since the noninterventionist forest management approach practices at May Creek have allowed the forest to continue its transition with minimal interference.

As in past years, the community is facing some challenges, both internal and external. The main external challenges are the threat of development near May Creek and poachers. There is still a possibility that an interstate could be constructed near May Creek as well as real estate and mining developments on land neighboring May Creek. Poachers continue to be a problem as they illegally harvest ginseng and goldenseal from May Creek private and communal land. Though these two external impacts do not directly affect the trees in the forest, they do affect the overall quality and value of the forest due to increased noise pollution, decreased economic value, and possibly increased erosion. Creekers would like to minimize these effects, but have little control over them as they do not control the decision-making for these impacts.

On the other hand, there are internal challenges at May Creek. The main internal challenges are centered around involvement of the second generation, the potential economic use the forest, and threatened community cohesion. Creekers have been wrestling with the first two for many years, but have recently been struggling with the last challenge. There is a great deal of uncertainty about what will happen to May Creek in the future, since the second generation's plans are unclear. The population and resultant forest use could increase or decrease depending on the decisions of the second generation. If Creekers decide to pursue an economic enterprise based in-part or in-full on forest resources, then the forest will obviously be affected. The impact may not necessarily be negative, but it depends on the characteristics of the income generating project, if any develops.

Lastly, May Creek is facing a challenge that it has not dealt with in the past – community cohesiveness. Past IFRI reports cite that May Creek institutions are strong because the “communal spirit, in fact, has become a durable norm” and “Creeker attitudes about the community, based on mutual trust and respect, have been maintained over the years.” May Creek was founded on two important values: respect for nature and communal living. Even though the communal aspect of May Creek seems to have eroded some, it may not necessarily affect the forest since the other value, respect for nature, appears to be independent of communal living. Regardless, Creekers seem to be concerned about the erosion of community cohesion that has been occurring over the years and has been accelerated in the past five years and want to improve the situation.

Given May Creek's history of overcoming obstacles and finding creative ways to maintain the community and the forest, it is possible that the community and forest will continue to thrive, though no doubt with bumps along the way.

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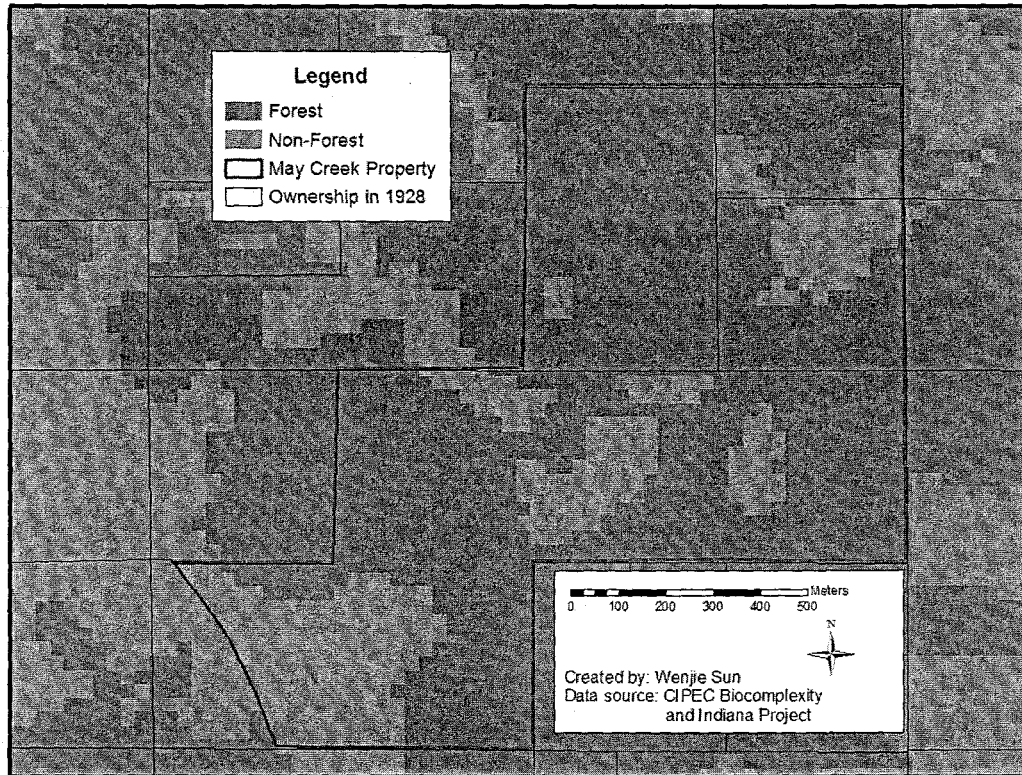
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ANNEX

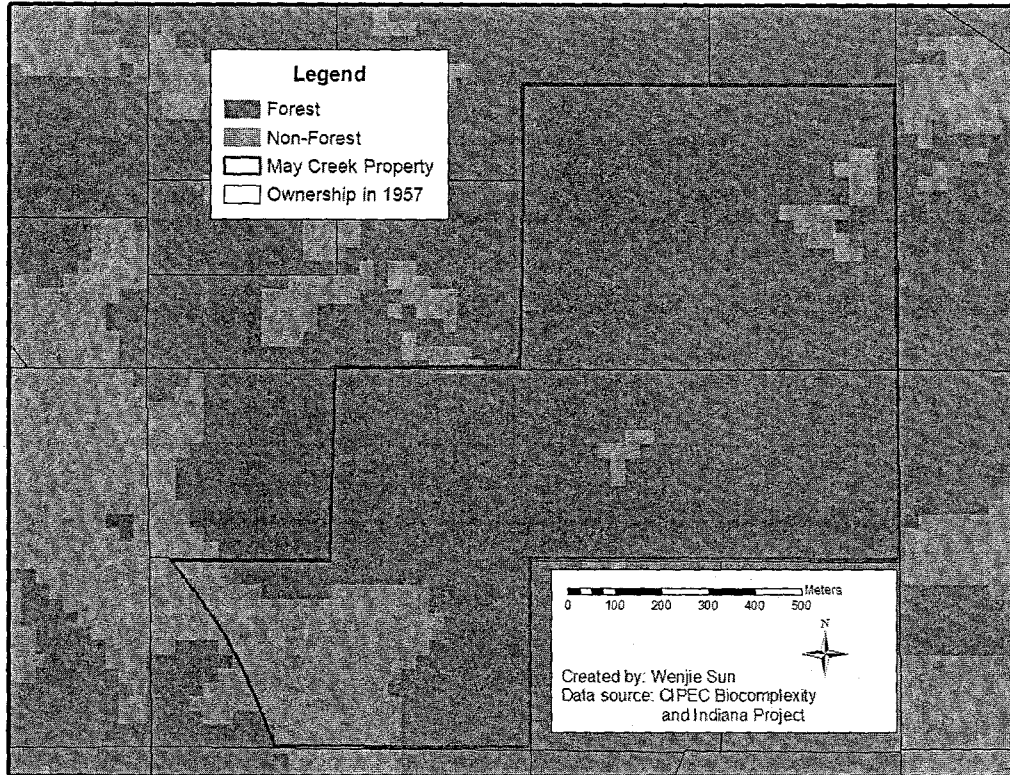
Table A1: Seasonal Average Temperature and Precipitation at May Creek (Source: <http://www.weather.com>)

| SEASON | TEMPERATURE (DEGREES F) | TEMPERATURE (DEGREES C) | PRECIPITATION (INCHES) | PRECIPITATION (MILLIMETERS) |
|-----------------------|----------------------------|----------------------------|---------------------------|--------------------------------|
| Spring (Mar.-May) | 54 | 12 | 13 | 327 |
| Summer (Jun.-Aug.) | 73 | 23 | 12 | 310 |
| Fall (Sep.-Nov.) | 55 | 13 | 11 | 268 |
| Winter (Dec.-Feb.) | 32 | 0 | 9 | 219 |

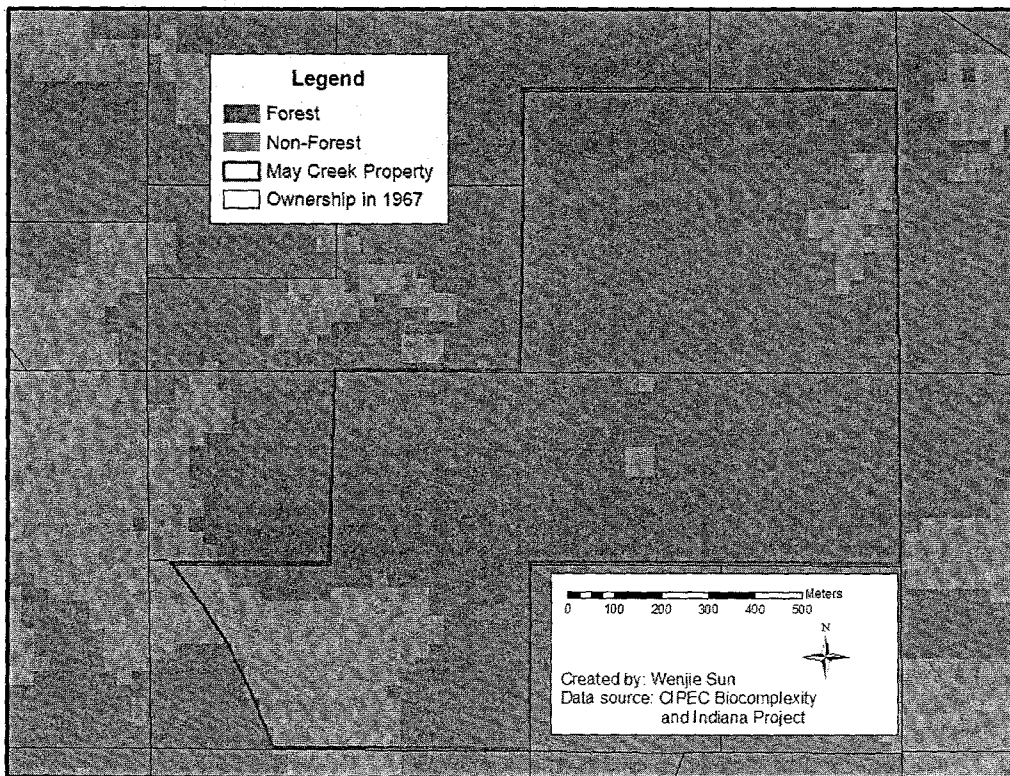
Land Cover of May Creek and Vicinity in 1939 and Ownership Boundaries in 1928



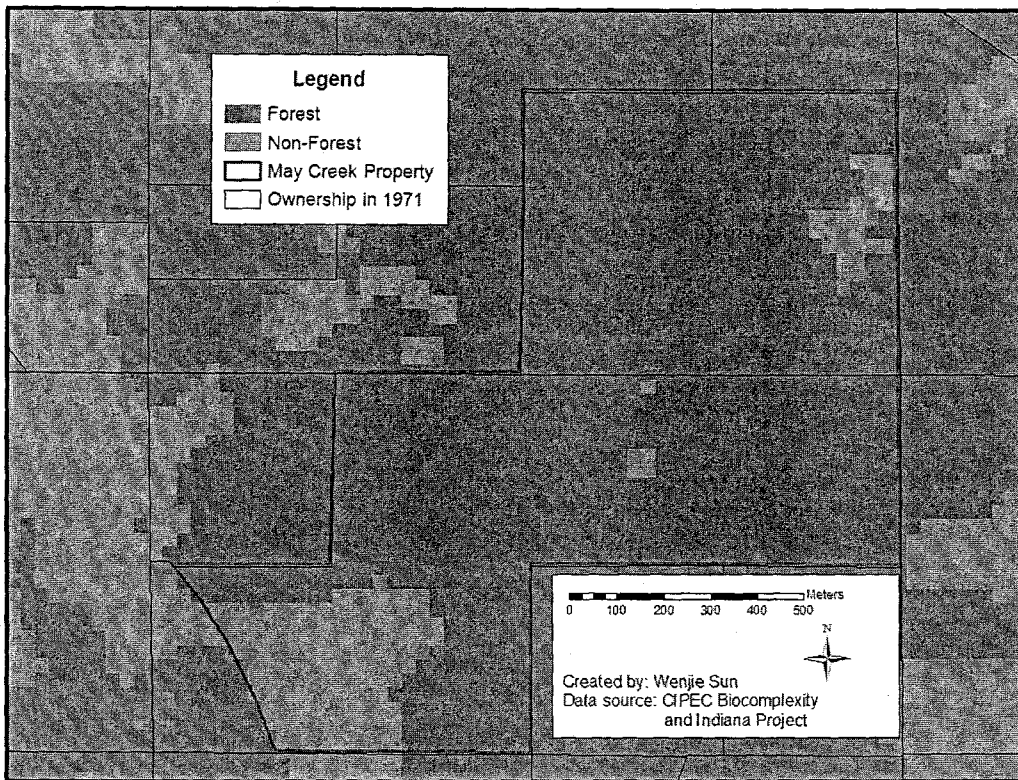
Land Cover of May Creek and Vicinity in 1958 and Ownership Boundaries in 1957



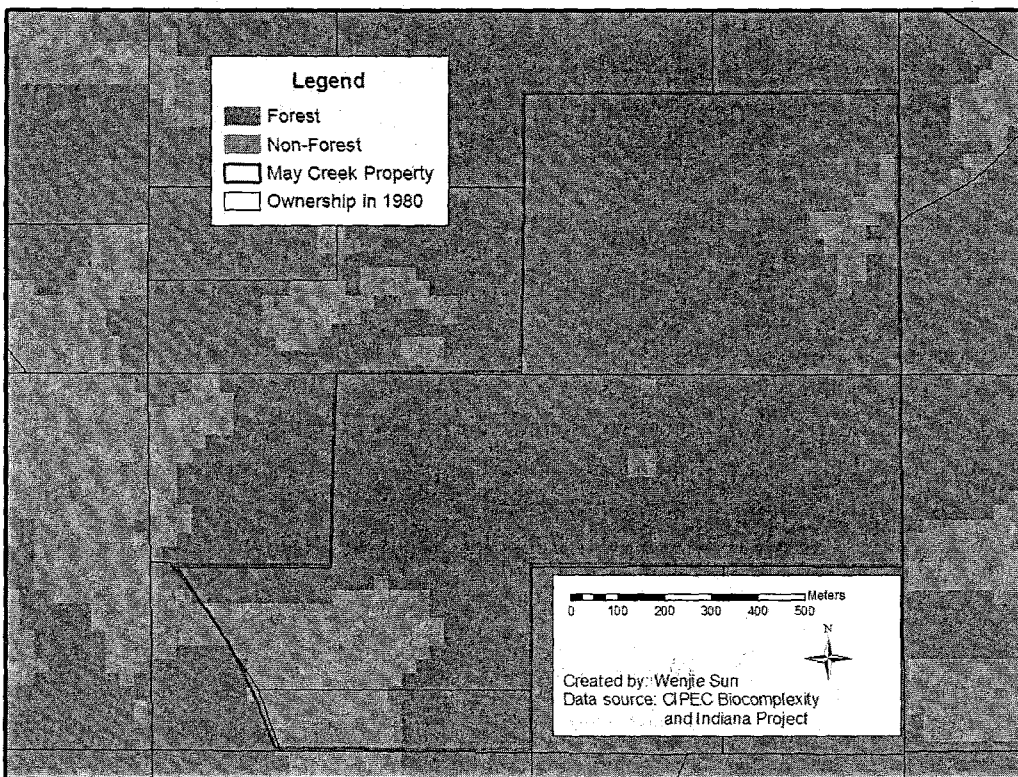
Land Cover of May Creek and Vicinity in 1967 and Ownership Boundaries in 1967



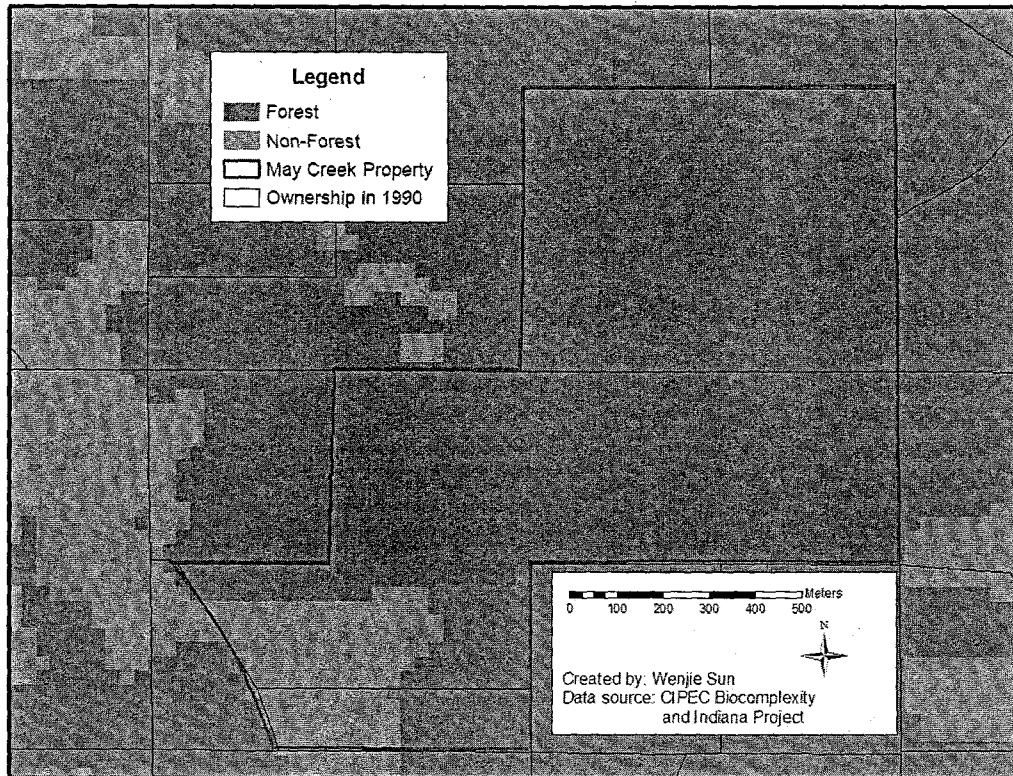
Land Cover of May Creek and Vicinity in 1975 and Ownership Boundaries in 1971



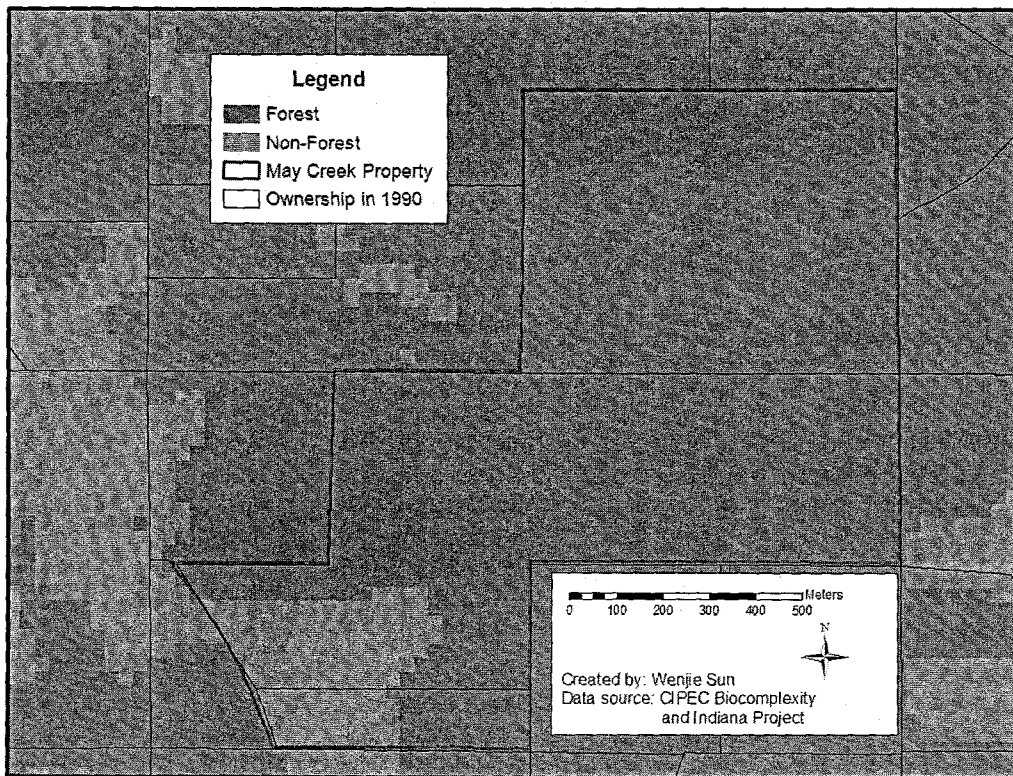
Land Cover of May Creek and Vicinity in 1980 and Ownership Boundaries in 1980



Land Cover of May Creek and Vicinity in 1987 and Ownership Boundaries in 1990



Land Cover of May Creek and Vicinity in 1993 and Ownership Boundaries in 1990



Land Cover of May Creek and Vicinity in 1998 and Ownership Boundaries in 1997

