



# **FOREST AT WORK: CONSERVATION AND SUSTAINABLE MANAGEMENT OF THE FORMER FINCH PRUYN LANDS**

by Rachel Ainsworth Neugarten

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FOREST AT WORK: CONSERVATION AND SUSTAINABLE MANAGEMENT  
OF THE FORMER FINCH PRUYN LANDS

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## ABSTRACT

Major selloffs of industrial timberlands in the U.S. in the past two decades have prompted environmental concerns about fragmentation and conversion of forest lands, as well as social and economic concerns about the loss of traditional livelihoods in forestry and rural community decline. In an effort to maintain intact forests and the many ecological and socioeconomic values they provide, conservation organizations, public agencies, and local communities are investing in complex “working forest” land deals in which land and property rights are divided among multiple actors. These transactions represent large, expensive, and relatively untested experiments in integrating conservation, sustainable forest management, and economic development. As such, there is a need for critical assessment in order to evaluate outcomes, manage adaptively, and inform the design of future transactions. We reviewed existing definitions of sustainable forest management, as well as case studies of working forests, to evaluate how ecological and socioeconomic indicators are incorporated in forest management and policy. We also undertook an in-depth case study of a working forest transaction involving the former Finch Pruyn lands in New York State, to explore how this particular arrangement integrates international, regional, and local sustainability goals. We found that our current ability to learn from past experience with working forests is severely limited by a lack of integrated, iterative monitoring data. Monitoring programs tend to be short-term and stymied by small budgets, high staff turnover, and the complexity of the underlying socio-ecological systems. We also found that management objectives for the Finch Pruyn working forest reflect ecological criteria that are consistent with international standards for sustainable forest management, as well as many of the goals described by regional and local actors, such as providing new public recreation opportunities and maintaining some level of forest-

related employment. Specific goals related to supporting local economic development were less well reflected in management objectives. Such goals, however, are arguably beyond the scope of a single land deal. In general, we found that working forest transactions have the potential to achieve multiple conservation and sustainability goals, as well as helping to reconcile long-held disputes over forest land management. However, our current ability to assess outcomes is limited by the relatively recent emergence of this strategy and a lack of empirical evidence, particularly related to socioeconomic outcomes. The lack of evidence could exacerbate existing disputes about the relationship between forest land use, ecological integrity, and socioeconomic well-being. Given the inherent complexity of the issues surrounding working forests, we recommend integrated ecological and socioeconomic monitoring to support adaptive management and to build on existing networks between conservation groups, environmental agencies, forest landowners, and local communities. By bringing critical attention to these large, complex experiments in forest conservation and sustainable management, we hope to inform efforts to simultaneously protect ecological integrity and meet the needs of current and future generations.

## BIOGRAPHICAL SKETCH

Rachel Neugarten holds a B.A. from Columbia University, where she majored in environmental biology. From 2004-2008 she worked for The Nature Conservancy, an international conservation organization, conducting freshwater ecological assessments, researching the effectiveness of ecological restoration programs, and supporting planning and evaluation of conservation projects. In 2008 she enrolled in the Cornell University Department of Natural Resources to study the effectiveness of large-scale efforts to integrate conservation with sustainable forest management. She currently lives in Ithaca, NY.

To my aunt, Brenda Carter, for inspiring and nurturing my love of  
birds' nests, frog ponds, fungus art, and oak trees.

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## CHAPTER 1

### WORKING FORESTS: AN INTRODUCTION

#### *1.1 Introduction*

Forests harbor much of the earth's biodiversity. According to some estimates, forests provide habitat to between 50 and 90% of all terrestrial species on the planet (Millennium Ecosystem Assessment 2005). Forest ecosystems also provide many goods and services valuable to humans such as clean water, climate regulation, timber, and recreation. Costanza and colleagues (1997) estimated that the world's forests provide ecosystem services worth \$4.7 trillion each year. While the calculations behind such estimates have been questioned, the importance of forests to both biodiversity and human well-being is not in dispute. However, forests are threatened by increasing human development and consumption. It is estimated that less than 25% of the world's original forests still remain in large, intact blocks (Potapov et al. 2008).

In the U.S., fragmentation and conversion of forest lands have been driven by development pressures and changes in the forest industry, both of which have precipitated a major shift in private forest land ownership. Industrial forest product companies have sold off millions of hectares of land across the country, driven by competition from global markets, escalating development values of forest lands, and tax disincentives for land ownership. Between 2001 and 2007, over 11 million hectares of industrial forest lands were sold in the U.S. (Bliss et al. 2010). In many cases, lands were sold to a new class of owners, primarily financial investors such as Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs). Financial investors have different economic objectives and timelines than industrial owners, who often held lands for many decades and managed forests to

provide long-term stable flows of wood or pulp to local mills. Depending on the objectives of the new owners and the strength of timber and real estate markets, forest land sales can lead to more intensive logging, subdivision, or conversion of forest lands for recreational or residential development. The resulting fragmentation and degradation of forest ecosystems has potentially grave consequences for many forest-dependent species (Hagan et al. 2005; Theobald et al. 1997).

Industrial forest land sales also have potentially significant implications for people who live, work, or play in and near forests. Subdivision and development of forest land can reduce recreational access (Weinberg & Larson 2008), reduce the local land base available for timber harvesting (Kline et al. 2004), and facilitate additional development of nearby lands. These changes can have a transformative effect on rural communities by threatening forest-related livelihoods, altering patterns of recreational use, and facilitating a transition to a second-home economy (Gobster & Rickenbach 2004).

While industrial forest land sales represent a challenge to efforts to conserve forests and maintain traditional ways of life, they also provide an opportunity for public agencies, private conservation groups, and local communities to buy land (Block & Sample 2001). Recognizing this, a number of public and private actors have made significant investments in forest lands in recent years. In some cases, lands have been purchased outright and turned into protected areas. Public and private funds available for land acquisition, however, are dwarfed by the size of recent sales. Despite protection efforts, subdivision and conversion of forest lands are predicted to continue in coming years. Even taking into account reforestation of former agricultural lands, researchers predict that by 2050, an additional nine million hectares of forest lands in net may be lost across the U.S. (Stein et al. 2005).

Converting productive forest lands into protected areas is also often politically unpopular due to concerns about effects on livelihoods and associated cultural and economic impacts on local communities. Forest land sales often take place in rural areas already suffering from long-term economic decline (Bliss et al. 2010) and thus have the potential to exacerbate existing socioeconomic problems. For example, Kusel (1996) found that extensive job loss in rural forest communities was devastating in the short and long term, causing social turmoil, difficulties for families and long-term reduction in community capacity. (Community capacity is defined as “the collective ability of residents in a community to respond to external and internal stresses; to create and take advantage of opportunities; and to meet the needs of residents” (Doak & Kusel 1996 p. 380).) Other authors have questioned the relationship between land protection and forest-related employment (Freudenburg et al. 1998) and the relationship between timber harvesting and community well-being (Charnley 2006). Nonetheless, major changes in land ownership and management have the potential to change longstanding patterns of forest land use, with uncertain consequences for local communities.

### **Changing Human Values**

Concurrent with, and in part driven by, the physical transformation of forests and timberland ownership has been a shift in human values related to forests. Over the past century in the U.S., utilitarian views that emphasized timber production were replaced by increasing recognition of forests’ many ecological, aesthetic, and recreational values (Bengston 1993). On public lands, the multiple values of forests were formally recognized in government policies beginning with the 1960 Multiple Use Sustained Yield Act (Public Law 86-517). On private lands, the public benefits provided by forests were recognized in programs that provided tax incentives for

approved forest management practices, as well as conservation easements, in which landowners agree not to subdivide or develop land in exchange for a payment or tax break.

The transition from old to new ways of valuing forests has not been smooth, however; it has frequently been accompanied by bitter social conflict. The controversies frequently center on the perceived or actual tradeoffs between environmental protection and livelihoods (“jobs versus the environment.”) “Local” interests in livelihoods and economic development in rural communities are also often positioned against “outside” interests in conservation represented by urban dwellers, environmental organizations, and government agencies. For example, in the 1980s and 90s, the U.S. Pacific Northwest was the stage for emblematic political battles in which traditional livelihoods in forestry and the economic viability of rural communities were pitted against environmental concerns related to logging of old growth forests and threatened species such as the Northern Spotted Owl (Freudenburg et al. 1998). These battles culminated in the passing of the Northwest Forest Plan, which vastly reduced logging on public lands.

Subsequent studies indicated that the Plan had mixed results, both in terms of ecological and socioeconomic outcomes. It increased the amount of late successional and old growth forest, and improved watershed conditions (Haynes et al. 2006). Unfortunately, populations of the Northern Spotted Owl continued to decline, possibly due to earlier habitat loss or displacement by another species, the Barred Owl. Of the roughly 1,300 human communities in the region, approximately one third experienced declines in socioeconomic well-being during the study period, one third stayed the same, and one third experienced improved well-being (Charnley et al. 2006). Some communities were negatively affected by losses of forestry and agency jobs and reduced agency spending, which exacerbated long-term declines in the timber sector.



Other communities seemed unaffected or improved during the study period, generally due to other factors such as proximity to major transportation corridors.

### **Working Forests**

Social conflict related to forest land protection has also caused public agencies and conservation organizations to re-evaluate traditional conservation strategies. This shift has been driven by demands for social justice and economic security by people who live and work near forests and protected areas (Adams & Hutton 2007; McCarthy 2002) as well as a practical recognition of the political and financial constraints that limit traditional protection efforts. In response to concerns about the ecological, social, and economic implications of industrial forest land sales, public agencies and conservation organizations have begun to invest in large-scale “working forest” transactions. These arrangements strive to protect forest lands from subdivision and development while also promoting sustainable forest management and recreation. In these complex land deals, property rights are divided among numerous public and private owners.

For example, in 2002, the New England Forestry Foundation (NEFF), a non-profit conservation organization, purchased the development rights to over 300,000 hectares of forest lands in Maine for \$28 million (Levitt 2003). The lands are still owned by a private entity, Pingree Associates, which retained the right to harvest timber. However, the lands are protected from subdivision or development in perpetuity under the terms of a “working forest conservation easement” purchased by NEFF. Easements are an increasingly large component of land protection efforts; in 2000, local and state land trusts made 60% of their investments in land conservation using easements (Fishburn et al. 2009).

Over time, working forest transactions have grown in both size and complexity. In 2006, The Nature Conservancy and the Conservation Fund purchased 114,000 hectares of lands scattered across eleven states from International Paper, in a set of transactions which totaled \$375 million (Sutter et al. 2009). Going forward, the lands will be owned and managed by over 20 public and private entities including state agencies and TIMOs, with some of the properties subject to conservation easements. Management goals vary by property but include ecological restoration, public recreation, and financial returns from timber harvesting. Many of the properties are subject to fiber supply agreements with local mills, which will ensure they are kept in production for a period of time.

Many other examples of working forest transactions, encompassing vast areas, have been negotiated in the past decade. For example:

- In 1998, the Champion International paper company sold over 121,000 hectares of land in New York, Vermont and New Hampshire to The Conservation Fund for \$76.2 million, to create a combination of publicly protected areas and sustainable timber management lands (Revkin 1998).
- In 2005, Domtar Industries sold 42,000 hectares of land in New York to The Nature Conservancy and Lyme Timber for a total of \$23.7 million (DePalma 2005). The lands are currently managed as a combination of public Forest Preserve and sustainably managed timber lands.
- In 2008, The Nature Conservancy and The Trust for Public Land began a phased purchase of over 125,000 hectares of land in Montana from Plum Creek for \$490 million, with plans to transfer the lands to the USDA Forest Service, the state of Montana, and private buyers (The Nature Conservancy 2009).

Working forest transactions represent major new strategies to reconcile competing interests in conservation, timber production, and provision of public goods such as

recreation. They have been hailed as “win-win-win” scenarios that simultaneously protect the environment, provide private economic returns to the landowner, and provide valuable social benefits to the public (Levitt 2003). However, there is considerable ambiguity in the term “working forest,” and different actors place different emphasis on environmental, social, and economic factors (Wolf & Klein 2007). Also, while a few studies have examined the relationship between working forests and biodiversity (Hagan et al. 2005; Jenkins 2008), or the potential implications for local communities (Bliss et al. 2010); few empirical studies have examined both ecological and socioeconomic dimensions of working forests. The magnitude of the investment of public and private conservation funds into working forests and the large geographical areas involved point to a need for critical assessment.

## ***1.2 Research Overview and Context***

In cooperation with The Nature Conservancy, we undertook an interdisciplinary research project in order to assess how working forest transactions have addressed ecological and socioeconomic objectives in the past, and to derive lessons for future transactions. Our research centers on a set of case studies, including a particular working forest land deal developing around the former Finch Pruyn lands in the Northern Forest region of New York. In this chapter we provide context on the Northern Forest and the Finch Pruyn transaction and outline a framework for our analysis, including a review of the literature on sustainable forest management and monitoring to support adaptive management. We also outline our research questions. In Chapter 2, we review case studies of ecological and socioeconomic monitoring of working forests, and derive recommendations for future integrated monitoring efforts. In Chapter 3, we examine how ecological and socioeconomic goals of relevant actors

are being addressed in the context of the Finch Pruyn working forest. Ultimately, our goal is to inform current and future efforts to manage working forests for both ecological integrity and human well-being.

### **The Northern Forest and the Adirondack Park**

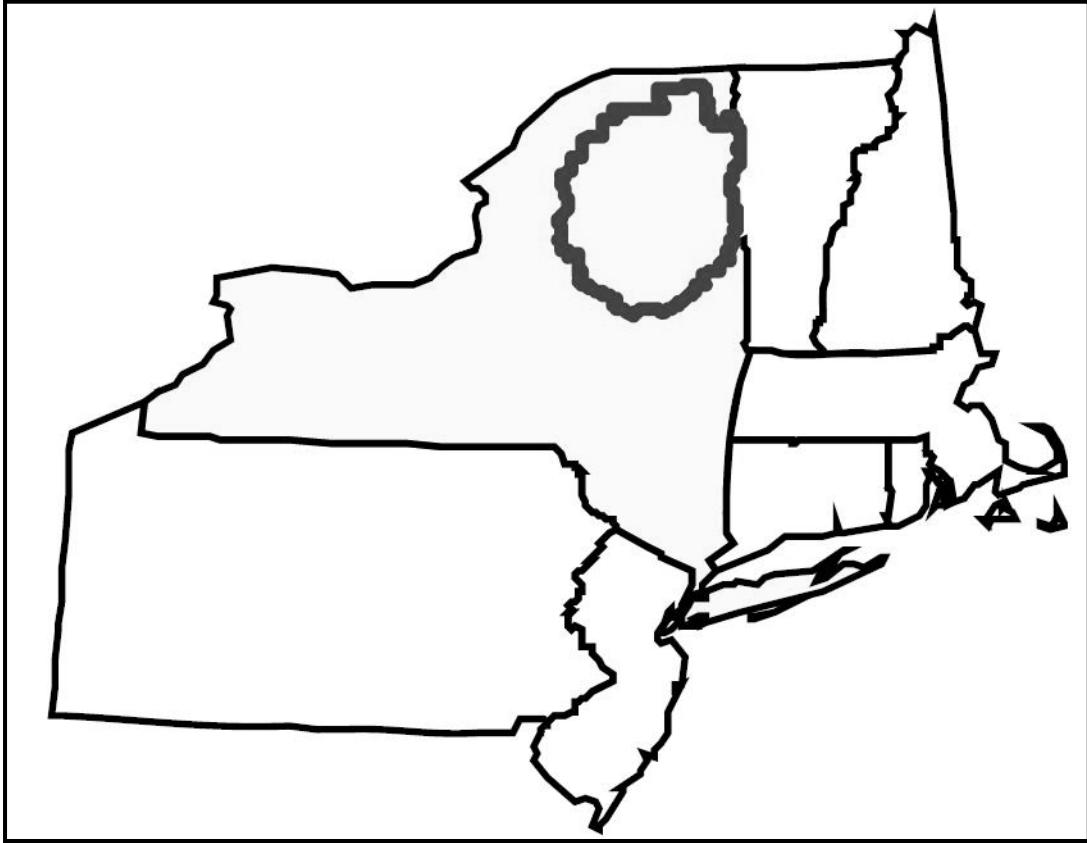
The Northern Forest region encompasses 10.5 million hectares in northern Maine, New Hampshire, Vermont, and New York. Due to a long history of human settlement and use, temperate broadleaf and mixed forests like those that blanket the Northern Forest are among the planet's most threatened forest types. Globally, it is estimated that over 45% of this forest type has been converted to human-dominated uses (Hoekstra et al. 2005). Thus protection and management of forests in the northeastern U.S. are matters of global conservation interest. The Northern Forest also falls within driving distance of 70 million people (Northern Forest Center 2008), making it a vast recreational resource to major cities including New York, Boston, and Montreal.

Forest cover increased in the region throughout most of the 20th century as abandoned farmland was re-colonized by trees (Drummond & Loveland 2010; Foster et al. 2010). Beginning in the 1970s, however, this trend was reversed due to urban and suburban development near cities as well as parcelization of industrial forest ownerships in rural areas. Major sales of industrial timberlands and increasing development pressures in the 1980s ignited concerns about forest fragmentation and conversion, and associated negative effects on the ecological and cultural heritage of the region. In response, a Northern Forest Task Force was convened and undertook a study of threats to the region's forest resources and developed recommendations for protecting "the long-term integrity and traditional uses of land" (USDA Forest Service & Governor's Task Force on Northern Forest Lands 1990). The resulting report

included 37 recommendations related to fostering stewardship of private forest lands, protecting exceptional resources, strengthening the economies of rural communities, and promoting forest research, monitoring, and education (Northern Forest Lands Council 1994). The recommendations led to significant private and public investment in forest land conservation over the following two decades, including a number of large-scale working forest transactions. These investments continued to fuel public debates about the relative economic, ecological, and social values of forests.

The Adirondack region of New York State, which falls within the Northern Forest, has a long history of environmental protection and public controversy surrounding forest land use. At nearly 2.4 million hectares, the Adirondack Park is the largest protected area in the contiguous United States (Figure 1.1). The park is unusual for U.S. protected areas in that it encompasses a checkerboard of public and private lands, including state-owned Forest Preserve areas managed for environmental protection and public recreation, private lands managed for timber or other resources, rural residential areas, and villages. The park also has a history of social tensions related to competing interests in environmental protection and economic development. Much of the debate centers on the expansion of state protected areas and regulation of private lands (Terrie 2008). Similar to the conflicts in the Pacific Northwest, debates in the Adirondacks generally position “local” interests in economic development, employment, and private property rights against “outside” interests in environmental protection.

Historically, forest products companies such as International Paper, Champion International, Domtar Industries, and Finch, Pruyn & Co., Inc. owned large tracts of forest land within the park. Beginning in the 1980s and accelerating until the early 2000s, a decline in the regional forest products industry prompted paper mill closures



**Figure 1.1** Adirondack Park, New York State. Map: The Nature Conservancy.

in the region; the Adirondacks went from having fourteen paper mills in 1920 to having only two in 2002 (Jenkins & Keal 2004). During this period, industrial forest landowners also began selling off their Adirondack holdings to a combination of financial investors, conservation groups, and the state of New York, which purchased select parcels to add to the State Forest Preserve.

### **The Finch Pruyn Working Forest**

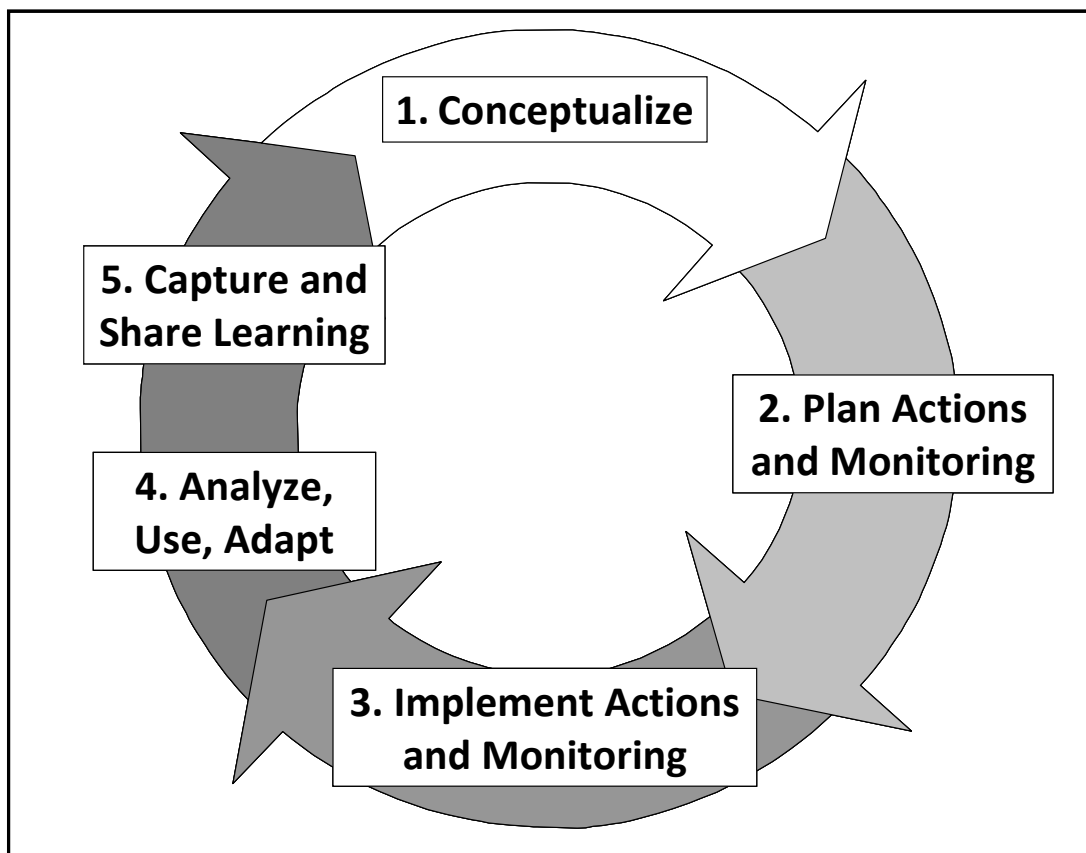
The final industrial forest land sale involved over 65,000 hectares of land formerly owned by Finch, Pruyn & Co., Inc. In 2007, The Nature Conservancy purchased the land for \$110 million, with plans to transfer the most ecologically

valuable lands to the State to become public protected areas, and the rest to a private landowner who would continue to harvest timber, subject to a conservation easement. The land sale was part of a larger transaction in which Finch, Pruyn & Co., Inc. was sold to a new entity owned by a financial investor group. Additional components of the plan included selling selected parcels to local municipalities for community development projects, and expanding an existing snowmobile trail network in an effort to bolster the region's winter recreation economy. Lastly, the plan included a fiber supply agreement with the Finch Paper mill, one of the last remaining paper mills in the region.

The Finch Pruyn transaction is similar to many other working forest deals, in that it encompasses a large geographic area, involves multiple public and private entities, and attempts to reconcile multiple ecological and socioeconomic demands on forest lands. Due to its large size and cost, the Finch Pruyn deal also drew a lot of public attention. It was hailed by both local and national media sources, including the New York Times ("A deal worth cheering," New York Times Editorial Staff 2007) and the Adirondack Explorer ("Deal of the century," Brown 2007). While most of the coverage was positive, local media sources also reported concerns about the effects of additional state land acquisitions on local communities, in particular the reduction of private recreational use by hunt clubs (e.g. "Finch Pruyn sale marks end of an era") (Mann 2007). Concerns about state land acquisitions in New York were exacerbated in 2009-2010 due to an economic crisis, which necessitated severe state budget cuts (Nearing 2010). Because of its large size, visibility, and significant environmental and socioeconomic values, the Finch Pruyn transaction provides a unique opportunity to evaluate a working forest deal in progress.

## Monitoring and Adaptive Management

Monitoring, defined as the systematic collection of data on status or trends, is a recognized component of an adaptive management cycle (Conservation Measures Partnership 2007). This cycle includes defining the project objectives, planning project activities, implementing activities, monitoring outcomes, analyzing and applying monitoring data, and capturing and sharing resulting information (Figure 1.2).



**Figure 1.2** Adaptive management cycle. Figure adapted from the Conservation Measures Partnership 2007.

Monitoring can provide information about the status of key ecological or socioeconomic variables of interest (Vos et al. 2000). It can also support efforts to track progress towards project objectives and reduce uncertainty about causal relationships between variables (Kremen et al. 1994; Margoluis & Salafsky 1998;



Salafsky et al. 2002). With respect to working forests, monitoring could play several important roles in demonstrating accountability and adapting management and policy over time. Forestry staff may wish to assess management alternatives and demonstrate environmental or economic performance to supervisors, funding entities, or the public. Project managers may wish to assess the effectiveness of investing in working forests relative to other conservation or management options. Local communities have a vested interest in tracking the relationship between forest land use and local well-being. Other groups may be interested in participating in monitoring in order to more effectively engage in planning and decision making.

Unfortunately, given scarce resources, monitoring the outcomes of conservation efforts is often a lower priority than other programs, such as land acquisition or restoration (Bernhardt et al. 2005; Ferraro & Pattanayak 2006). This is true for working forest transactions as well: investments in monitoring represent a very small fraction of investments in land and easement acquisition (Block et al. 2004; Sutter et al. 2009). Thus to date, working forests represent a very large, expensive, and relatively untested strategy. Monitoring of working forests faces a number of challenges, however. Working forests encompass large geographic areas, which often do not align with the socio-political boundaries that define communities, counties, or states. Also, trees grow slowly, which means that forest ecosystems are relatively slow to respond to changes in the environment or the management regime. Lastly, working forests are managed for a mix of ecological and socioeconomic goals.

In order to be effective, monitoring programs must integrate both ecological and socioeconomic indicators at multiple spatial and temporal scales. Given the financial restrictions facing many of the groups involved in working forests, selection of appropriate, cost-effective monitoring indicators and methods is critical. Other authors have provided suggestions for developing effective monitoring programs and

prioritizing expenditures (Margoluis & Salafsky 1998; Salzer & Salafsky 2006; Stem et al. 2005). Our goal is to add to this literature by exploring some of the issues specific to integrating ecological and socioeconomic monitoring for working forests.

### **Defining Sustainable Forest Management**

A possible framework for analyzing the ecological and socioeconomic dimensions of working forests can be derived from international efforts to define sustainable forest management. These efforts can be traced to the 1992 United Nations Conference on Environment and Development (UNCED), which outlined principles for sustainable development, including sustainable management of forests (UNCED 1992). These principles stipulate that:

Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products.

Following UNCED, an International Seminar of Experts on Sustainable Development of Boreal and Temperate Forests was convened in 1993 in Montreal, Canada (Montréal Process Working Group 1995). Experts outlined seven criteria and 64 indicators of sustainable forest management. The criteria include conservation of biological diversity, forest productive capacity, forest ecosystem health, soil and water resources, forest contributions to global carbon cycles, multiple socio-economic benefits, and legal, institutional and economic frameworks for forest conservation and sustainable management. The Montreal Process Criteria and Indicators (MPC&I), as they came to be known, became an international standard for defining and measuring sustainable forest management. There have been a number of efforts to apply the MPC&I at national and regional scales. For example, a modified version of the criteria

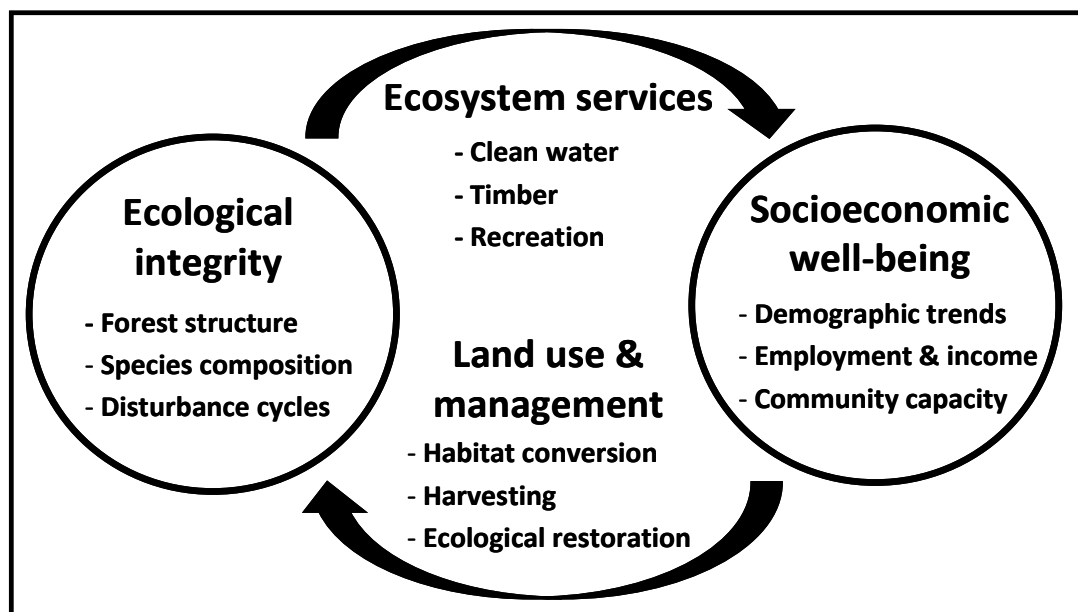
and indicators were used to assess ecological and socioeconomic trends at a series of ten “model forests” across Canada (Beckley et al. 2002). In the U.S., the USDA Forest Service has developed national and regional reports on the state of the nation’s forests, using the MPC&I as a framework (Carpenter 2007; USDA Forest Service 2004, 2008).

There have also been efforts to define sustainable forest management at smaller spatial scales, such as private commercial ownerships or public management units. For example, the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) developed certification standards for sustainable forestry operations. As of 2010, FSC standards have been adopted for more than 129 million hectares of land, primarily in North America and Europe (Forest Stewardship Council 2010), and over 78 million hectares in North America were certified under SFI (Sustainable Forestry Initiative 2010).

Other standards for sustainable forest management have been developed, with varying emphases on biodiversity conservation, harvest levels, consumption and waste of forest products, soil productivity, water quality, carbon dynamics, recreation, well-being in local communities, cultural values of forests, rights of indigenous people, and legal and institutional settings. Gordon Hickey and colleagues (2006) conducted a comprehensive review of 27 of these so-called “soft-law” standards, which included comparing over 1,000 indicators. They reported that in general, soft-law standards had the highest number of monitoring requirements for indicators related to planning, forest health, forest inventory, and socioeconomic characteristics of the affected public, and the fewest monitoring requirements for indicators related to fire, erosion control, soils, geomorphology, and forest ecosystem contributions to global cycles, such as carbon fluxes. This indicates that existing standards focus primarily on variables related to forest management (i.e. cutting trees) and socioeconomic well-

being, with less emphasis on ecological dynamics such as disturbance cycles, or the role of forests in climate regulation.

Despite variations in emphasis, all sustainable forest management standards attempt to address both ecological and socioeconomic dimensions. For our analysis, we conceptualize forest sustainability as a combination of ecological integrity, socioeconomic well-being, and the interaction between them (Figure 1.3).



**Figure 1.3** Conceptual model of forest sustainability

Conceptually, our model is quite similar to a diagram developed by Kelly and Bliss (2009), who have proposed a new paradigm for forest management that balances “healthy forests” and “healthy communities.” In both models, forest ecological integrity or “healthy forests” include components such as forest structure, species composition, and disturbance cycles (left side of the diagram.) Socioeconomic well-being or “healthy communities” include components such as population and demographic trends, employment and income levels, and community capacity (right side.) The relationship between ecological integrity and socioeconomic well-being

consists of the goods and services provided to society by intact ecosystems, such as clean water, timber, and recreation (top arrow.) It also consists of the use and management of natural ecosystems by people, such as habitat conversion, harvesting of natural resources, or ecological restoration (lower arrow.)

There have been efforts to define and measure each of these components of sustainability independently. For example, there have been efforts to develop indicators of ecological integrity in northern temperate forests (Noss 1999; Tierney et al. 2009) and socioeconomic well-being in forested regions (Beckley et al. 2002; Northern Forest Center 2000). We sought to assess how efforts to define criteria and indicators of sustainable forest management, described above, have integrated these two dimensions of sustainability. We conducted a comparison of indicators of sustainable forest management (including MPC&I, FSC and SFI) to indicators of forest ecological integrity, on the one hand, and socioeconomic well-being, on the other. Results from our comparison are summarized below and in Appendix 1.

Proposed indicators of ecological integrity in northern temperate forests are relatively consistent. They typically include variables related to forest patch size and forest connectivity; diversity of age classes and structural characteristics; disturbance cycles (such as storms, fires, or floods); invasive species; and soil chemistry (Noss 1999; Tierney et al. 2009, see Appendix 1). In addition to these standard variables, Noss (1999) proposed additional metrics related to the status of forest-dependent species, as well as the impacts of human recreational use. Tierney et al. (2009) went a step further, defining desired targets for the proposed indicators, such as forest patch sizes of 50 hectares or greater.

Indicators of socioeconomic well-being in forested landscapes are less standardized. Nonetheless, some commonalities exist. Assessments typically begin with a set of indicators available from census data, such as population and

demographic characteristics, employment and income levels, poverty rates, and educational attainment. Census data are often combined with other existing datasets or new information collected through surveys or interviews. For example, the Northern Forest Wealth Index (Northern Forest Center 2000) brought together data on human health, employment, cultural resources, recreation and tourism opportunities, and a number of other metrics. The Adirondack Park Regional Assessment (LA Group 2009) brought together employment, income, and education statistics with land use data and information on infrastructure needs such as water, sewer, roads, and telecommunications. In addition to so-called “objective” economic characteristics, socioeconomic assessments associated with the Northwest Forest Plan (Charnley 2006) and the Canadian Model Forest Network (e.g. Beckley et al. 2002) incorporated “subjective” metrics, such as community members’ perceptions of their own well-being. The data collection required for subjective metrics, such as interviews and surveys, is more costly than relying on existing data. It can provide a more accurate and complete assessment of well-being, however (den Otter & Beckley 2002).

We found that the MPC&I, FSC and SFI align relatively well with proposed indicators of forest ecological integrity, as they include specific indicators related to species diversity, forest fragmentation, age class and structural diversity, invasive species, tree growth and mortality, and natural disturbance (Appendix 1). However, these standards do not include the full range of indicators related to socioeconomic well-being, except for those directly related to employment in forestry and recreation on forest lands. Other indicators commonly used to assess well-being in forested landscapes are not explicitly included in existing forest sustainability schemes. These include overall employment, income, and poverty levels; population and demographic trends; access to basic services; and perceived well-being. The MPC&I include an indicator titled “Resilience of forest-dependent communities” but do not define it or

suggest how it might be measured. This finding is consistent with Gough et al. (2008), who found that existing criteria and indicator schemes are “particularly weak in the area of social and cultural indicators” (p. 425). Thus we observed some asymmetry in the treatment of the ecological and socioeconomic dimensions of sustainable forest management.

### ***1.3 Research Questions***

In this study, we set out to evaluate empirical examples of working forests, including the Finch Pruyn working forest, to better understand their role in conservation and sustainable forest management efforts. The research questions that structured our analysis include:

- 1. How do working forests align with existing definitions of sustainable forest management, including indicators of forest ecological integrity and socioeconomic well-being?*
- 2. What is the potential for ecological and socioeconomic monitoring to inform management and policy related to working forests?*
- 3. How have international, regional, and local sustainability goals been addressed in the context of the Finch Pruyn working forest?*

To answer these questions, we 1) conducted a review of the literature on sustainable forest management, forest ecological integrity, and socioeconomic well-being in forested landscapes, 2) examined case studies of existing ecological and socioeconomic monitoring of working forests, through a literature review and conversations with key experts, and 3) evaluated the alignment between the terms of the Finch Pruyn transaction and ecological and socioeconomic goals for the region, based on interviews and questionnaires given to 36 relevant actors. Results from part 1 are summarized above, and results from parts 2 and 3 are summarized in subsequent

chapters. The interview guide, questionnaire, and additional results are provided in Appendices 2-6. Additional materials, including case studies, publications, and media coverage of working forests are available online:

<http://conserveonline.org/workspaces/cornellworkingforest>

In general, our goal was to evaluate the potential for working forests to contribute to long-term sustainable management of forests for the benefits of both ecosystems and people. Through this research we hope to advance ecological protection and human well-being through support of design and implementation of current and future working forest transactions.

### **Author's Note**

This thesis is composed of four chapters: an introduction (this chapter), two self-contained papers that will be submitted to journals for publication, and a conclusion. The introduction and conclusion chapters were written by R. Neugarten. The papers that constitute chapters 2 and 3 were co-authored by R. Neugarten and three members of her graduate committee: S. Wolf, R. Stedman, and T. Tear. The research and data analysis were carried out by R. Neugarten in consultation with her full committee.



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## CHAPTER 2

### ECOLOGICAL AND SOCIOECONOMIC MONITORING OF WORKING FORESTS: ARE WE SEEING THE FOREST FOR THE TREES?\*

#### *2.1 Abstract*

Major selloffs of industrial timberlands over the past two decades in the U.S. have prompted concerns about conversion and fragmentation of forest ecosystems, as well as the loss of traditional livelihoods in forestry and rural community decline. In an effort to maintain intact forests and the many ecological, social and economic benefits they provide, conservation organizations and public agencies have invested millions of dollars into large “working forest” land deals. These deals represent a recent innovation for conservation and sustainable forest management, with uncertain ecological and socioeconomic implications. As such, they warrant a corresponding investment in monitoring to support learning and adaptive management. We conducted a literature review and spoke to key experts involved in environmental and socioeconomic monitoring of working forests in the U.S. and Canada to evaluate current monitoring efforts and derive recommendations for future programs. We found few documented examples of monitoring that incorporated both ecological and socioeconomic indicators at relevant geographic or temporal scales. Monitoring programs tended to be short-term and focus on variables related to forest cover and harvest activity, with less focus on aquatic systems, species diversity, or social and economic effects on local communities. This limits our ability to measure and demonstrate progress toward conservation and sustainability goals. We recommend better integration of ecological and socioeconomic indicators at multiple scales. This

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\* Neugarten, R.A., S.A. Wolf, R.C. Stedman, and T. H. Tear, in prep.

will require dedicated, long-term funding, but is necessary if we are to learn if these large, complicated, and expensive experiments are worth the investment.

## ***2.2 Introduction***

From 2001 to 2007, over 11 million hectares of industrially owned forest land were sold in the United States (Bliss et al. 2010). This major shift in ownership was driven by changes to federal tax law which made it unattractive for forest products companies to own land, heightened competition due to global market integration, and escalating land values (Bliss et al. 2010; Block & Sample 2001). These sales, projected to continue in coming years, have potentially significant consequences for forest ecological integrity and human well-being in rural communities.

The majority of the lands were purchased by financial investors, such as Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs). These new owners have different financial goals and timelines than traditional forest products companies. Changes in forest ownership can lead to more intensive harvesting, subdivision, or development, with uncertain consequences for biodiversity (Hagan et al. 2005). Development of forest lands also reduces the local land base available for harvest, with potentially transformative effects on local communities (Bliss et al. 2010; Weinberg & Larson 2008).

The public and private funds available for forest protection, however, are dwarfed by the size of the recent sales (Block and Sample 2001). Also, proposals to establish parks or preserves often face strong political opposition due to concerns about forest-related employment, local property taxes, and recreational access. These land sales generally occur in rural areas experiencing long term economic decline (Bliss et al. 2010), exacerbating the economic and cultural conflicts over forest land use.

In this context, public agencies, conservation organizations and local communities are seeking innovative ways to both maintain intact forest lands and support community economic development (Block & Sample 2001; Weinberg & Larson 2008). A principle strategy involves investing in large-scale “working forest” land deals, designed to prevent development while promoting sustainable logging and public recreation (Ginn 2005; Perschel 2006; Wolf & Klein 2007). These deals often involve dividing property rights among several public and private sector entities.

For example, in 2002 the New England Forestry Foundation, a conservation organization, purchased the development rights to over 300,000 hectares of private forest land in Maine for \$28 million (Sader et al. 2002). Transfers of development rights, known as conservation easements, have become a standard component of land protection efforts. In 2000, local and state land trusts made 60% of their investments in land conservation through easements (Fishburn et al. 2009). The effectiveness of easements as a strategy for conservation remains unproven, however. In a study of 119 conservation easements held by The Nature Conservancy, a major conservation NGO, fewer than 20% of the sampled easements were found to have quantitative biological monitoring (Rissman et al. 2007). This indicates that, to date, the ability of easements to protect biodiversity is mostly speculative.

Over time, working forest deals have grown in cost and complexity. Conservation organizations often purchase lands, retaining ecologically significant parcels, or selling them to public agencies to become protected areas. Remaining lands are sold to timberland investors, sometimes under the terms of a “working forest conservation easement.” In addition to restricting subdivision and development, working forest conservation easements also sometimes include provisions for public recreation and require the landowner to adhere to sustainable forestry standards, such as those outlined by the Forest Stewardship Council (1996). For example, in 2006,

The Nature Conservancy and the Conservation Fund purchased 114,000 hectares across eleven states from International Paper in a set of transactions which totaled \$375 million. In the future, the lands will be managed for ecological restoration, public recreation, or commercial forestry by over 20 agencies, private landowners, and private equity firms (Sutter et al. 2009). As of 2010, only a small fraction remains in ownership by The Nature Conservancy.

The shared concerns of conservation groups and timber interests have created new opportunities to seek out shared middle ground. A number of other working forest deals have been negotiated across the U.S., collectively encompassing millions of public and private conservation dollars and hundreds of thousands of hectares of land (Ginn 2005; Perschel 2006). These transactions reflect concerns that fragmentation and development are greater threats to forests than logging, or the notion that “the most dangerous critter in the woods is not a man with a chainsaw but a man with a lawnmower” (Wolf & Klein 2007 p. 996). Working forest deals have been hailed as “win-win-win” scenarios that simultaneously respond to the economic interests of private landowner, the social sustainability interests of rural communities, and the environmental and recreation interests of the public (Levitt 2003).

Working forests are an ambitious and untested approach to integrating economic, social and ecological claims on forestland. While grounded in contemporary strategies to address contentious issues of forest management and forest politics, there has been little research of their effectiveness at conserving biodiversity or achieving sustainability goals. Given the size of the investment into working forests, and the uncertainties involved, we see an urgent need for real data to support learning and adaptive management. Monitoring can support learning, help track and demonstrate progress toward project objectives, and inform adaptive management (Salafsky et al. 2002; Stem et al. 2005). While there is broad agreement on the utility

of monitoring, little is known about the practice of monitoring applied to this new generation of forest conservation initiatives.

Our research investigates the practice and potential of monitoring to support management and policy related to working forests. By “monitoring” we refer to the systematic collection of data on status or trends (Margoluis & Salafsky 1998). By “working forests” we refer to forests actively managed for a combination of environmental and socioeconomic goals. There is considerable ambiguity within this term and related concepts such as sustainable forest management and multiple use forestry (Wang 2004). Different actors may emphasize environmental or socioeconomic dimensions of working forests (Wolf & Klein 2007). In this study, we explore some of these ambiguities by synthesizing existing efforts to define and monitor working forests. We structured our analysis to address three key questions:

- 1) *To what extent is monitoring being pursued to inform management and policy applied to working forests?*
- 2) *How do existing efforts to monitor working forests integrate ecological and socioeconomic indicators?*
- 3) *What considerations should guide future integrated monitoring efforts?*

### **2.3 Methods**

We conducted a literature review to find documented examples of monitoring programs associated with working forests in the U.S. and Canada. To identify relevant studies, we searched three databases (ISI Web of Science, BIOSIS Previews, and Environment Index) using the key phrases “monitoring” and “working forest” or “sustainable forest management.” For this analysis we focused on recent (post-1990) studies that provided detailed information on monitoring approaches, costs, indicators, and results. We found very few studies that were detailed enough to be included in our

review. To identify additional, unpublished examples, and to get updated information, we also contacted the lead authors of several of the more detailed studies. We asked the authors to elaborate on the integration of ecological and socioeconomic indicators, monitoring costs, challenges faced by monitoring programs, and how results were used to inform management and policy.

#### **2.4 Results**

Our literature search resulted in over 134 articles, however we excluded most of them because they described hypothetical monitoring frameworks rather than actual programs, they lacked sufficient information, or they focused on monitoring of specific biophysical indicators such as forest soil chemistry. For this analysis we focused on seven studies that addressed monitoring of working forests and had sufficient detail to be included (Table 2.1). These included: (1) a survey of monitoring programs associated with 45 working forest conservation easements in the U.S. (Block et al. 2004); (2) a survey of management practices and monitoring programs of 174 forested properties owned or managed by The Nature Conservancy in the U.S. (Howard et al. unpublished data) and (3) a study of monitoring of 22 certified sustainable forestry operations within Europe and North America (Hickey et al. 2005). These comparative studies allowed us draw some general conclusions about the frequency, type, and perceived effectiveness of monitoring of different types of working forests.

We also identified two detailed case studies of ecological monitoring programs associated with the working forest land deals described above; (4) the Pingree conservation easement in Maine (Sader et al. 2002), and (5) The Nature Conservancy's International Paper land acquisition in the Southeastern and Midwestern U.S. (Sutter et al. 2009).

**Table 2.1** Ecological and socioeconomic monitoring programs reviewed for this analysis

<b>Type of working forest</b>	<b>Location</b>	<b>Type of monitoring</b>	<b>Citations</b>
Certified forestry operations	U.S., Canada, Europe	Ecological, socioeconomic	Hickey et al. 2005
Working forest conservation easements	U.S.	Ecological	Block et al. 2004
Forested properties owned or managed by The Nature Conservancy	U.S.	Ecological	Howard et al. unpublished data
Pingree conservation easement	Maine, U.S.	Ecological	Sader et al. 2002
The Nature Conservancy's International Paper land acquisition	Southeastern and Midwestern U.S.	Ecological	Sutter et al. 2009
Federal forest lands included under the Northwest Forest Plan	Oregon, Washington, and California, U.S.	Ecological, socioeconomic	Charnley et al. 2006
Canadian Model Forest Network	Canada	Socioeconomic	Parkins et al. 2001, den Otter and Beckley 2002, Beckley et al. 2002, MacKendrick and Parkins 2004, Gravelines and Vasudevan 2006

We found no comparable examples of socioeconomic monitoring programs associated with working forest land deals. Instead, we reviewed case studies of socioeconomic monitoring programs associated with large-scale forest policy initiatives, including (6) the Northwest Forest Plan in the U.S. Pacific Northwest (Charnley 2006), and (7) a series of studies from the Canadian Model Forest Network (Beckley et al. 2002; den Otter & Beckley 2002; Gravelines & Vasudevan 2006; MacKendrick & Parkins 2004; Parkins et al. 2001b). Collectively, the case studies provided a more in-depth

perspective on approaches, costs, results, and challenges facing individual monitoring efforts.

We found other relevant examples of integrated monitoring programs; for example national and multi-state monitoring programs that assess forests at even larger spatial scales (Carpenter 2007; USDA Forest Service 2008) as well as one-time assessments (Ostrom & Nagendra 2006; Spies et al. 2008). For this analysis, however, we focused on examples of iterative monitoring (not one-time assessments) that were conducted at geographic scales relevant to working forest land deals. We also selected case studies that we felt provided the best examples of innovative, multi-scale monitoring programs.

### **Comparative Studies**

The three comparative studies we reviewed indicated that while many working forests involve some form of monitoring, the types of indicators tracked and the perceived effectiveness of monitoring programs were limited. The survey of working forest conservation easements indicated that most of the easements in the sample (39 of 45) were being monitored (Block et al. 2004). However, certain indicators were monitored more frequently than others. Indicators related to forest management, such as the extent of roads, clear cuts, and riparian stream buffers were monitored on all of the easements where they appeared. Indicators related to non-motorized recreation, collection of non-timber forest products, and water pollution were monitored less often, on only 60-85% of easements where they appeared. Certain ecological variables such as “old-growth forest” and “wetland area” were monitored on all of the easements where they were listed as a management goal, whereas “aquatic habitats,” “biodiversity,” and “ecological processes” were monitored on only 30-60% of the easements where they appeared as goals.



The perceived effectiveness of monitoring, defined as the ability to detect an easement violation, varied by both indicator type and monitoring approach. For example, the number and size of clear cuts were more easily detected, and therefore more effectively monitored, than the amount of downed woody debris. Ground-level monitoring, used alone, was considered less effective than when it was combined with other methods, such as annual meetings between the landowner and easement holder. Thus the authors recommended combining monitoring approaches to improve monitoring effectiveness.

Similarly, the majority of the forest properties in The Nature Conservancy survey (141 out of 174) were subject to some level of monitoring (Howard et al., unpublished data), but again the type of indicators monitored varied. Terrestrial ecosystems were monitored on 46% (80 properties) and forestry practices were monitored on 26% (45 properties), whereas freshwater systems were only monitored on 6 % (11 properties), even though “watershed protection” was a stated goal for 81% (141) of the properties.

All 22 certified forestry operations in the Hickey et al. (2005) study were subject to some level of monitoring, reflecting requirements for annual audits of certified forestry operations. Indicators related to forest harvest practices and wildlife management were frequently monitored, but water, soils, fire, carbon cycling, and pollution were monitored less often. The authors suggested that the focus of monitoring programs reflect certification requirements, which center on forest management rather than ecological dynamics. Nonetheless, they found the lack of formal monitoring for soil and water-related indicators “surprising” as these factors were “relevant to sustainable and adaptive forest management at the local level” (p. 248). The authors also reported a lack of socioeconomic monitoring, even though forest certification schemes explicitly address social and economic concerns.

## **Case Studies**

Both the Pingree and International Paper (IP) monitoring programs combined several monitoring methods, such as satellite imagery, aerial photography, surveys of forest managers, and site visits. Site visits or meetings with forest managers were cited as being critical for correctly interpreting, and acting on, changes detected via remote sensing. Both programs were reportedly effective at detecting harvest activities and changes in forest cover. For example, little forest cover loss was detected across the former IP lands in the first two years (Sutter et al. 2009). Some properties actually experienced substantial re-growth, following extensive cutting that occurred prior to the sale. However, the authors noted that two years is not enough time to track long-term management activities or their effects.

The IP and Pingree monitoring programs also focused on indicators related to forest management rather than aquatic systems or forest species diversity. Both programs included indicators related to harvest practices, construction or maintenance of roads and buildings, the condition of riparian buffers, and fragmentation. Site-level monitoring of species or plant communities was conducted on some of the IP properties, however the monitoring protocols were not standardized. Techniques for evaluating forest diversity from remote sensing were being developed for the Pingree lands. Neither monitoring program was designed to include indicators related to socioeconomic effects of forest management.

Socioeconomic monitoring programs associated with the Northwest Forest Plan and the Canadian Model Forest Network also took a mixed-methods approach. For example, census-based indicators such as employment, income and poverty levels; demographic trends, and property values were combined with interviews with community members about their perceived well-being (Charnley 2006; den Otter & Beckley 2002; Parkins et al. 2001a). Mixed approaches were reported to be more

expensive, but also more effective, than relying on census data alone. For example, census data indicated low levels of well-being in Newfoundland communities, but residents reported relatively high levels of well-being due to strong place attachment, social support, and unreported supplemental income (den Otter & Beckley 2002).

Socioeconomic monitoring programs also demonstrated that the relationship between forest management and community well-being is not straightforward. For example, reduced federal timber harvests following the Northwest Forest Plan were found to have mixed effects on the over 1,300 communities in the region (Charnley et al. 2006). Some communities experienced employment and income declines in the forest sector, as well as declines in agency employment and contract spending. Other communities experienced no change or improved well-being during the study period, generally due to other factors such as proximity to a major transportation corridor. Linking changes to forest management was difficult due to mediating variables such as the strength of the timber sector in each community prior to plan implementation, the extent to which wood harvested on federal forest lands supported that sector, and the degree to which local residents depended on agency employment. The authors concluded that the assumed relationship between stable levels of timber harvest and community stability was flawed.

Staff involved with both environmental and socioeconomic monitoring noted that the programs were severely challenged by a lack of stable funding. For example, the government of Canada invested a total of \$500,000/year in the Canadian Model Forest Network, which supported all aspects of the program (not just monitoring,) but funding ended after a specified 15-year period. The Nature Conservancy invested approximately \$500,000 over five years in the IP monitoring program; however the program was expected to end prematurely in 2010 due to insufficient funding. The Pingree monitoring program is permanently supported by a \$1 million endowment

established by the New England Forestry Foundation, but the program may have to be scaled back in the future due to increased monitoring costs.

Also, investments in socioeconomic and ecological monitoring were not symmetrical. For the Foothills Model Forest in Alberta, an estimated \$50-75,000 per year was spent on monitoring, only a fraction of which (\$6-8,000) supported socioeconomic monitoring. At the Prince Albert Model Forest in Saskatchewan, an estimated \$50,000 was spent to develop and report socioeconomic indicators, however this was a one-time investment only. By comparison, the total budget for the Northwest Forest Plan socioeconomic monitoring was approximately \$1.6 million (Charnley 2008), however this was a small portion of the total \$50.2 million monitoring budget, over half of which was dedicated to monitoring the Northern Spotted Owl. In the future, socioeconomic monitoring will continue but the budget has been reduced to approximately \$50,000 per year, sufficient for census-based assessments only.

## ***2.5 Discussion***

The literature on monitoring of working forests is sparse. Nonetheless, the comparative and case studies we identified allow us to make a few generalizations about monitoring across the diverse management and ownership arrangements that characterize working forests:

- 1) Current investment in monitoring of working forests is inadequate to evaluate effectiveness.* Where monitoring was being pursued, the range of indicators and the duration of financial commitments were limited. The IP monitoring budget represented approximately one tenth of one percent of the cost of the land acquisition, and the Pingree monitoring endowment was approximately three percent of the cost of the easement. This suggests that performance evaluation is

not a high priority in these land deals. These issues are not restricted to forests; despite billions of dollars invested in river restoration efforts in the U.S. since 1990, few were monitored for effectiveness (Bernhardt et al. 2005). While there may be other relevant monitoring efforts that have gone undocumented, the lack of accessible information limits our ability to learn from these investments. This could result in future challenges to working forest land deals by both environmental and socioeconomic interests.

- 2) *Monitoring is typically focused on forest management rather than forest ecosystems.* Environmental monitoring was largely focused on forest cover and harvest practices. Although protection of water resources and biodiversity conservation were often explicit management goals, aquatic ecosystems and species diversity were under-emphasized or excluded altogether in monitoring plans. This likely stems from legal and contractual obligations that emphasize tracking compliance with approved practices. It also likely reflects the limited capacity of monitoring entities, and the higher relative costs of ecological monitoring. Furthermore, there is a tendency not to monitor ecological effects of approved practices, despite a lack of evidence that these practices always achieve desired conservation outcomes (Ferraro & Pattanayak 2006; Pullin & Knight 2001).
- 3) *Monitoring is typically focused on forest management rather than people or communities.* Limited resources allocated to monitoring in general, and an absence of obligations to monitor socioeconomic indicators in particular, likely explain the asymmetrical investment in monitoring (Charnley 2008). Also, forest managers and monitoring entities often lack social science expertise. Working forest deals are often based on the flawed assumption that maintaining stable

flows of timber will support local well-being, contributing to the lack of enthusiasm for socioeconomic monitoring.

- 4) *Efforts to integrate socioeconomic and ecological monitoring face considerable challenges.* The geographic scales at which forest management takes place, such as ownerships or management units, rarely align with sociopolitical boundaries, such as communities or counties. It is also difficult to isolate the effects of forest management from other factors, such as trends in forest products markets and the national or global economy. The paucity of information represents a gap in our ability to understand forest management in different ecological and socioeconomic contexts.
- 5) *Monitoring results are not consistently incorporated in management or policy.* Several authors reported that information was often not fed back into existing management regimes or policy decisions. “Adaptive management,” in these cases, may take the form of applying lessons learned from past experience to the next generation of land deals or forest management policies. In cases where there is a formal mechanism for applying monitoring data, such as a certification program or legal conservation easement, there may be greater opportunities to adapt management over time.

### **Towards Integrated Monitoring of Working Forests**

While there is already extensive guidance for developing ecological monitoring programs (Stem et al. 2005, Vos et al. 2000, Margoluis & Salafsky 1998), there is a need for interdisciplinary, practical concepts and tools to support monitoring that integrates ecological and socioeconomic indicators at relevant scales. Based on our review, we developed four recommendations for future integrated monitoring efforts, as well as examples of monitoring methods and indicators (Table 2.2):

- 1) *Allocate a greater percentage of project funds to monitoring.* Given the complexities of implementing more comprehensive monitoring plans at multiple spatial and temporal scales, it will be necessary to invest a greater portion of project funds in monitoring. If this is not done, it will not be possible to assess the effectiveness of working forest land deals or inform future investments.
- 2) *Develop conceptual models demonstrating hypothetical or established relationships between ecological and socioeconomic factors, as well as the relationship between planned activities and desired outcomes.* These models can also highlight areas of uncertainty and focus monitoring programs to improve understanding the relationship between forests and people (Margoluis et al. 2009). We also recommend balancing “activity” indicators related to management activities with ecological or socioeconomic “outcome” indicators, such as changes in forest species diversity or local income generated by forest-related recreation.
- 3) *Balance ecological and socioeconomic indicators to reflect management goals.* Working forests are managed for both ecosystems and people, so monitoring programs should reflect this balance. For ecological monitoring, consider balancing terrestrial and aquatic indicators, as well as indicators related to the status of forest-dependent species, and not simply the condition of the trees. For socioeconomic monitoring, consider balancing economic indicators with locally-defined measures of well-being to get a more complete perspective.
- 4) *Combine monitoring approaches.* For both ecological and socioeconomic monitoring, mixed methods were shown to be most effective. We recommend approaches that explicitly combine information from extensive geographic analyses, such as remote sensing of forest cover or county-level census data; with more intensive analyses, such as ground-based ecological surveys or individual interviews.

**Table 2.2** Potential approaches and indicators for integrated, mixed-methods monitoring

<b>Method</b>	<b>Indicator type</b>		
	<b>Ecological</b>	<b>Forest management</b>	<b>Socioeconomic</b>
<b>Extensive</b>	Satellite imagery <ul style="list-style-type: none"> <li>- Forest cover</li> <li>- Disturbance</li> <li>- Fragmentation</li> </ul>	Census <ul style="list-style-type: none"> <li>- Employment and income in forestry</li> <li>- Employment and income in forest-related recreation</li> </ul>	Census <ul style="list-style-type: none"> <li>- Demographic trends</li> <li>- Employment level</li> <li>- Income level</li> <li>- Poverty level</li> <li>- Property values</li> </ul>
<b>Intermediate</b>	Aerial photography <ul style="list-style-type: none"> <li>- Forest cover</li> <li>- Disturbance</li> <li>- Fragmentation</li> <li>- Forest type</li> <li>- Structural diversity</li> </ul>	Forest manager survey <ul style="list-style-type: none"> <li>- Harvest data</li> <li>- Recreational use data</li> </ul>	Community survey <ul style="list-style-type: none"> <li>- Perceived well-being</li> <li>- Perceived relationship between forest and well-being</li> </ul>
<b>Intensive</b>	Field sampling <ul style="list-style-type: none"> <li>- Forest plots</li> <li>- Species inventories</li> <li>- Water quality sampling</li> <li>- Forest carbon dynamics</li> </ul>	Annual meeting <ul style="list-style-type: none"> <li>- Meeting between landowner and easement holder</li> </ul> Site visits <ul style="list-style-type: none"> <li>- Compliance with best management practices</li> </ul>	Individual interviews <ul style="list-style-type: none"> <li>- Perceived well-being</li> <li>- Perceived relationship between forest and well-being</li> </ul>

## **2.6 Conclusion**

Working forest land deals represent an untested hypothesis about the ability of forest management to meet a range of conservation and sustainability goals. As the ambitions and complexity of working forest transactions have expanded to encompass ever larger geographic areas, multiple owners and competing management objectives,



the sophistication of monitoring must keep pace. Without feedback, it is unlikely we can validate claims regarding ecological and socioeconomic performance of forest management, or enhance the efficacy of future investments.

We set out to evaluate whether working forests are contributing to the dual missions of conservation and sustainability. We found that we often lack sufficient evidence to conduct such an evaluation. In many cases we lack even a framework for gathering information in the future. We identified several innovative approaches to ecological monitoring of working forests, as well as studies that explored the relationship between forest management and human well-being across multiple scales. These studies provided opportunities to evaluate forest management in particular contexts and for specific periods of time. However, the short-term nature of the monitoring programs, and the meager and unbalanced investment into ecological and socioeconomic indicators, translated into a limited capacity to evaluate outcomes in different contexts or at temporal scales most relevant to slow-changing forest ecosystems.

We recognize the strict financial constraints facing monitoring efforts. Generating the information necessary to evaluate working forests evidently requires a legal obligation to monitor, a long-term funding source, and a formal mechanism for incorporating results into management decisions. This indicates a need to incorporate monitoring costs into project budgets from the start, and supports the use of tools such as conservation easements and forest certification to ensure standards are met. Better integration of indicators related to freshwater systems, species diversity, forest carbon dynamics, and socioeconomic impacts into formal monitoring requirements would better reflect the broader societal goals for working forests. We are not advocating a “count everything” approach, however; monitoring priorities can be developed based on the presence of rare or unique species, the perceived level of risk to natural and

human communities and the level of uncertainty about the effects of management activities (Salzer & Salafsky 2006).

In critiquing the practice of monitoring we also must recognize the failures of researchers, particularly social scientists, for not producing practical concepts and tools to support integrated monitoring. It is crucial that we better articulate the relationship between forest management and socioeconomic outcomes. We recognize that doing so entails significant uncertainties related to scale and causality, and will require investment of scarce resources in integrated, iterative monitoring. In the majority of working forest deals, however, the current cost of monitoring represents a tiny fraction of the funds invested in land or easement acquisition. Other authors have developed guidance for designing and implementing effective, low-cost monitoring programs. We have provided some recommendations specific to integrated monitoring. With a relatively modest investment, we believe it is possible to significantly advance understanding of these large, expensive experiments in conservation and sustainable forest management, and ultimately contribute to ecological integrity and socioeconomic well-being in forested landscapes.

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## CHAPTER 3

### CUTTING THE TREES TO SAVE THE FOREST: A CASE STUDY OF CONSERVATION AND SUSTAINABLE FOREST MANAGEMENT IN NEW YORK<sup>2</sup>

#### **3.1 Abstract**

Fragmentation and conversion of forest ecosystems drives species losses and threatens traditional livelihoods in forestry. Conservation organizations and environmental agencies are increasingly investing in large “working forest” land deals which seek to reconcile interests in environmental protection and timber production. These deals take place in the context of longstanding social conflicts related to forest land use and international efforts to define sustainable forest management. We undertook a case study of a working forest land deal in New York State, to assess how management objectives aligned with local and global sustainability goals. We found that management objectives addressed many ecological and socioeconomic goals such as conserving biodiversity, providing recreation and maintaining forest-related employment. This indicates that working forests have the potential to achieve sustainability goals, and to resolve some of the social conflicts surrounding forest land use. It will take additional work to ensure that past investments lead to desired results, however.

#### **3.2 Introduction**

Large, intact forests such as those that blanket the northeastern U.S. provide habitat for diverse species as well as numerous goods and services valued by humans,

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<sup>2</sup> Neugarten, R.A., S.A. Wolf, and R.C. Stedman, in prep.



such as timber, recreation, water purification, and carbon sequestration. Northeastern forests also represent a globally rare habitat type: over 45% of the planet's temperate broadleaf and mixed forests have been converted to human-dominated uses (Hoekstra et al. 2005). Concerns about fragmentation and conversion of northeastern forests ignited in the 1980s, due to major selloffs of industrial forest ownerships (Northern Forest Lands Council 1994). Driven by competition from global markets, tax disincentives for forest land ownership, and escalating development values of forest lands, industrial forest landowners have sold off millions of hectares of forest lands. Nearly 10 million hectares of forest lands in the northeast were sold between 1980 and 2005 (Hagan et al. 2005).

The lands were sold primarily to a new class of owners consisting of financial investors such as Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) (Bliss et al. 2010). Financial investors often have different financial objectives and timelines than industrial forest products companies. Transfers of ownership can lead to changes in land use such as more intensive logging, subdivision, or development, with uncertain consequences for forest-dependent species and ecosystem services (Hagan et al. 2005; Stein et al. 2010). Additionally, these land sales take place in rural areas, some of which are already undergoing long-term economic stagnation. Because of these factors, and the large land areas involved, industrial forest land sales have potentially significant implications for biodiversity, livelihoods in forestry, and patterns of recreational and residential development.

Traditional efforts to protect land through the creation of parks and preserves, however, are limited by the public and private conservation funds available for forest protection. Establishing new protected areas also alters traditional forms of forest land use, with potentially negative implications for local livelihoods and cultures. Land conservation is therefore deeply linked to debates about economic and social justice

(McCarthy 2002). In these debates, environmental protection is often pitted against economic development (“environment versus jobs”). The interests of local people are also often pitted against those of outside interest groups, such as conservation organizations and natural resource management agencies (West 1994). According to McCarthy (2002), concerns about access to and control over resources, livelihood issues, and the disenfranchisement of local users place forest land disputes within the realm of political ecology.

For example, in the 1980s and 90s, the U.S. Pacific Northwest was the stage for emblematic political battles in which traditional livelihoods in forestry and the viability of rural communities were pitted against environmental concerns related to logging of old growth forests and threatened species such as the Northern Spotted Owl (Freudenburg et al. 1998). These battles culminated in federal legislation that vastly reduced logging on public lands (Haynes et al. 2006).

In the eastern U.S., where the majority of forest land is privately owned, it is often not financially or politically feasible to achieve large-scale conservation goals solely through public protection. New York State, where our study takes place, has a long history of controversy related to the expansion of state protected lands and the environmental regulation of private lands (Terrie 2008). These tensions revolve around the question of how private property interests mesh with concerns for public goods such as ecosystem services (Pfeffer et al. 2005).

Recognizing the financial and political constraints on protected areas, conservation organizations and environmental agencies are seeking to integrate conservation efforts with sustainable resource use and economic development (Adams & Hutton 2007). In forested landscapes in the U.S., these projects have taken the form of “working forest” land deals in which large tracts of land are protected through complex public-private arrangements (Sullivan 2009). Compared to traditional

protected areas, working forests represent a radically different model for conservation and management. In these complex arrangements, the costs of land ownership and property rights are divided among multiple public and private entities, including conservation organizations, environmental agencies, private financial investors, and local communities.

Many of the transactions involve “working forest conservation easements,” formal agreements between a private landowner and a public agency or a land trust, in which the landowner agrees to forgo rights to subdivide or develop land in exchange for a payment or tax break (Lind 2001). Working forest conservation easements often include provisions for public recreation and sustainable forestry certification standards such as those outlined by the Forest Stewardship Council (1996). Many such arrangements have been negotiated in the past decade. For example,

- In 1998, the Conservation Fund purchased over 121,000 hectares of land in New York, Vermont and New Hampshire from Champion International for \$76.2 million, to become a combination of publicly protected areas and sustainable timber management lands (Revkin 1998).
- In 2006, The Nature Conservancy and the Conservation Fund purchased 114,000 hectares of lands scattered across eleven states from International Paper, in a set of transactions which totaled \$375 million (Sutter et al. 2009). Going forward, the lands will be owned and managed by over 20 public and private entities for a range of goals including ecological restoration, public recreation, and financial returns from timber harvests.
- In 2007, The Nature Conservancy purchased over 65,000 hectares of lands formerly owned by Finch, Pruyn & Co. in the Adirondack region of New York State for \$110 million, for a combination of publicly protected areas, private

timber lands subject to a conservation easement, and community development projects (de Palma 2008).

Our study focuses on the third example, the former Finch Pruyn lands. As one of the highest-profile land deals in the northeastern U.S., the Finch Pruyn working forest represents a novel experiment in conservation and political compromise. Because management plans for the Finch Pruyn working forest are still evolving, this case provides a unique opportunity to evaluate a working forest land deal in progress. By studying the deal as it evolves, we sought to bring attention to this new model of forest management.

Working forest land deals can be interpreted as a recent approach to sustainable forest management. As such, they build on international efforts to define and measure forest sustainability. For example, the 1992 United Nations Conference on Environment and Development (UNCED) laid out principles for sustainable development, including sustainable management of forests (UNCED 1992). Following UNCED, a seminar of international experts convened in Montreal, Canada to outline criteria and indicators for measuring and tracking forest sustainability (Montréal Process Working Group 1995, 2007). The criteria include conservation of biological diversity, forest productive capacity, forest ecosystem health, soil and water resources, forest contributions to global carbon cycles, multiple socioeconomic benefits of forests, and legal, institutional and economic frameworks for forest conservation and management. The “Montreal Process Criteria and Indicators,” as they came to be known, provide a framework for evaluating the ecological and socioeconomic dimensions of working forests.

Working forest land deals have also emerged as a strategy for ameliorating historical tensions between environmental and economic interests. These transactions have been touted as “win-win-win” scenarios with private, public, and environmental

benefits (Levitt 2003). Working forests are a relatively recent innovation in conservation and sustainable resource management, however. In addition, the concept of “working forest” is ambiguous, with different groups placing different emphases on ecological or socioeconomic outcomes (Wolf & Klein 2007). The size of the investment of public and private conservation funds into working forests, and the high ecological and socioeconomic stakes, point to a need for critical assessment. A few studies have addressed the environmental performance of working forests (Jenkins 2008; Sader et al. 2002), but to date there has been little research of how working forests integrate international and local sustainability goals. Given our argument that these deals are a strategic response to the social conflicts surrounding forest land use, we seek to evaluate the extent to which they succeed in doing so. The questions structuring our analysis were:

- 1) *How do management objectives for the Finch Pruyn working forest align with international standards for sustainable forest management, as outlined by the Montreal Process Criteria and Indicators?*
- 2) *How do management objectives for the former Finch Pruyn lands align with the goals of relevant actors, including:*
  - a) *People with different levels of influence over land use decisions, and*
  - b) *People with different environmental, social, and economic orientations?*

In the sections that follow, we outline our study methodology and describe the ecological and socioeconomic context for the Finch Pruyn transaction. We then briefly summarize the results of a comparison of the Finch Pruyn management objectives with the Montreal Process Criteria. Then we analyze how current management plans align with ecological and socioeconomic goals of key actors. We conclude with a

discussion of the implications of this new model of conservation for reconciling social conflicts related to forest land use and achieving international and local sustainability goals. Our goal is to inform management of the Finch Pruyn working forest in particular, and policy related to working forests more generally.

### **3.3 Methods**

We undertook a case study of the Finch Pruyn working forest, in cooperation with The Nature Conservancy, the organization that purchased the land in 2007. Case studies are useful approaches to conducting in-depth research on contemporary events over which the researcher has no control (Yin 2009). To identify formal management objectives for the Finch Pruyn lands, we reviewed public documents including press releases, the conservation easement, and the forest management plan. We also interviewed individuals responsible for designing and implementing the various contracts and provisions in order to better understand management plans. We then analyzed management objectives relative to the Montreal Process Criteria (Montréal Process Working Group 1995, 2007) and the interests of a range of actors from the region.

To identify the expectations and interests of relevant actors, we conducted semi-structured interviews (Wengraf 2001) with individuals selected from local and regional environmental organizations, public environmental agencies, recreation groups, local government, the forest products industry, and residents of local communities.<sup>3</sup> Our interview subjects were not intended to be a statistically representative sample of the population of the region. Instead, we sought out representatives of environmental and socioeconomic interest groups, as well as actors

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<sup>3</sup> Interview protocol was reviewed and approved by the Cornell University Institutional Review Board (Protocol ID# 08-09-064)

with various levels of influence over land use decisions. We worked with staff from The Nature Conservancy to identify interview candidates and develop interview questions.

The lead author conducted 36 interviews between March and September of 2009, 30 in person and six by phone. Interviews lasted from 30 minutes to two hours, and were either recorded and then transcribed (n = 28) or documented with handwritten notes (n = 8). Interviewees were asked about their goals for the Finch Pruyn lands, their goals for local communities, and possible indicators that could be used to evaluate progress (see Appendix 2 for the interview guide).

We grouped interviewees in two ways. First, we were interested in the goals of people with different levels of influence over land use decisions, in order to explore themes related to different levels of control over natural resources (McCarthy 2002; West 1994). Thus we grouped people by their level of involvement in the Finch Pruyn transaction. We distinguished interviewees who worked for one of the organizations directly involved in negotiations (“directly involved,” n = 15) from the rest of the interviewees (“indirectly involved,” n = 21). We recognize that in reality the interviewees represent a spectrum ranging from those with no influence to those with high levels of control. For this analysis, however, we found it useful to analyze responses using a two-way categorization.

We were also interested in exploring themes related to different environmental and socioeconomic interests. Thus we asked interviewees to fill out a close-ended questionnaire in which they allocated points to a set of categories adapted from the Montreal Process Criteria and Indicators (Appendix 3). The questionnaires allowed us to categorize interviewees into the following four groups: environmentally-oriented (n = 12), forestry-oriented (n = 9), socioeconomically-oriented (n = 9), or integrated orientations (n = 6). As above, we recognize that this is a simplistic categorization of

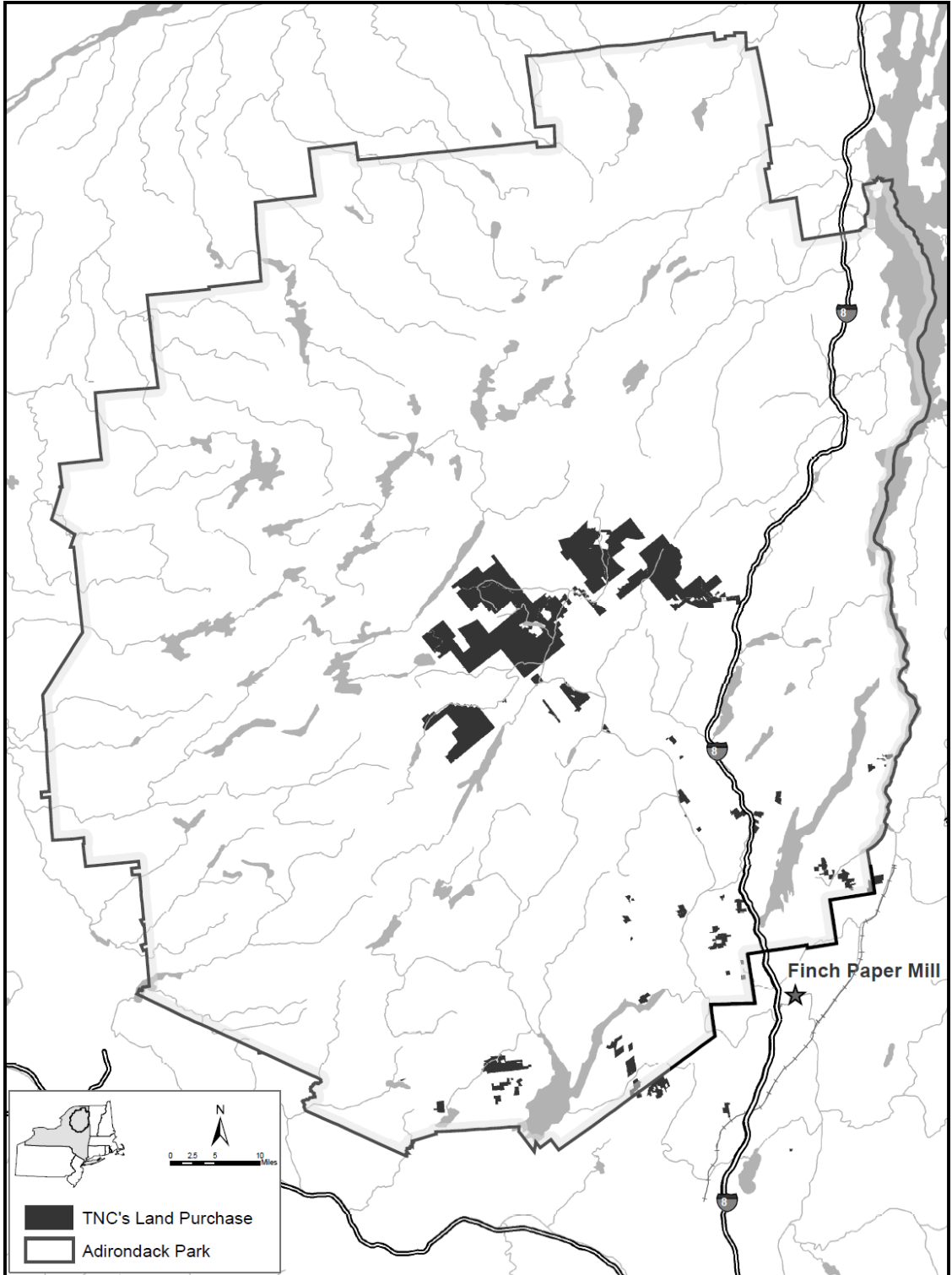
interviewees' interests. For this analysis, however, we found it served as a useful way to analyze responses. In particular, we focused on the differences between environmentally-oriented interviewees and interviewees with other (ostensibly less environmental) orientations, as debates about forest land use are often posed as conflicts between these two, ostensibly dichotomous groups (Freudenburg et al. 1998; Terrie 2008).

We coded the interview transcripts and notes using ATLAS.ti software designed for qualitative research (ATLAS.ti Scientific Software Development GmbH 2009). We coded interviewees' comments, focusing on their ecological and socioeconomic goals. We categorized goals with as much specificity as possible given interviewees' comments, and we grouped similar goals. We reviewed and revised the codes several times for consistency (Strauss 1987). For the below analysis, we compared the goals identified by interviewees with different levels of involvement and orientations.

## **Study Area**

The former Finch Pruyn lands are located in and around the 2.4 million-hectare Adirondack Park in New York State (Figure 3.1). The Park is the largest protected area in the contiguous U.S., and is unusual in the U.S. context in that it is comprised of a checkerboard of public, "Forever Wild" Forest Preserve lands interspersed with private lands, including privately owned timber lands, rural residential areas, and villages (Porter et al. 2009). As of 2007, Finch, Pruyn & Co. ("Finch Pruyn") was the largest remaining industrial forest landowner within the Park. Finch Pruyn held over 65,000 hectares of land consisting of several large, centrally-located parcels and a number of smaller parcels around the southeastern park boundary. The lands contain many important ecological features, including large blocks of intact temperate





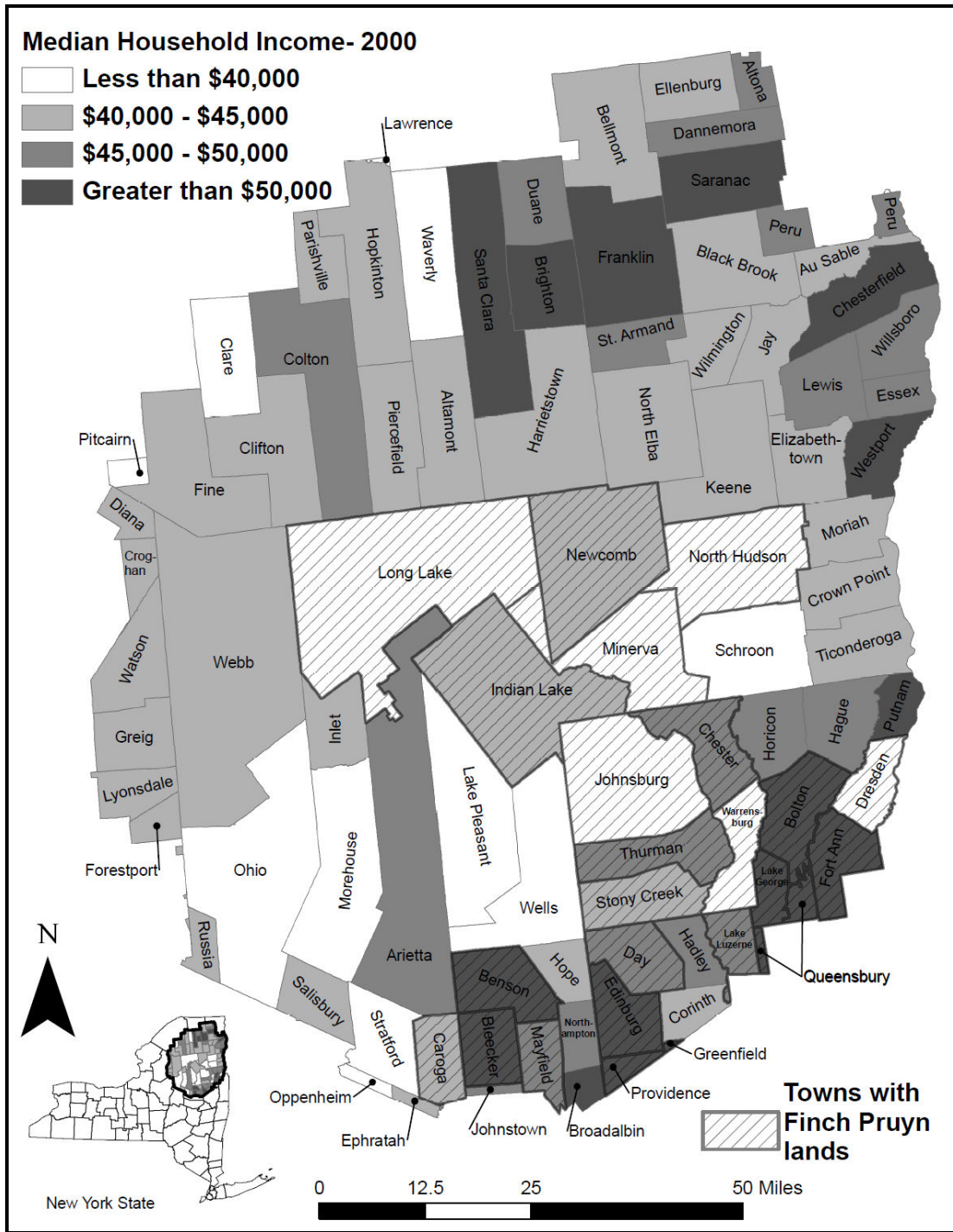
**Figure 3.1** The former Finch Pruyn lands, purchased by The Nature Conservancy (TNC) in 2007. Map: Craig Cheeseman, The Nature Conservancy.

deciduous forest, 90 mountain peaks, 70 lakes and ponds, over 6,000 hectares of wetlands, and rare species such as the imperiled Bicknell's Thrush (The Nature Conservancy 2008). The lands were historically managed for timber, including a portion of the fiber supply of the Finch Paper mill, a major employer in the nearby city of Glens Falls, NY. The lands also have a long history of use by private recreational groups such as hunt clubs, which support a cultural tradition of hunting and fishing in the region. The lands contain several scenic areas that have been coveted by public recreation groups, including the Hudson River Gorge and the 250-foot OK Slip Falls. Property tax payments on the land approach \$1 million/year, contributing to municipal budgets.

The lands are located in 27 towns spread across six counties. The socioeconomic setting is diverse, ranging from relatively small, poor communities formerly dependent on extraction industries such as forestry and mining, to relatively large, affluent communities with economies based on manufacturing or tourism. Median household income ranges from \$28,977 in the town of North Hudson to \$51,000 in the town of Putnam. Eighty percent of the former Finch Pruyn lands, totaling nearly 53,000 hectares, occur in five towns located in the center of the park. These towns are small (year-round population ranges from 266 to 1,471) and have relatively low household income (Figure 3.2).

### **The Transaction**

In 2007, the former Finch Pruyn lands were purchased by The Nature Conservancy (TNC), a non-profit conservation organization. The land sale was part of a larger transaction in which Finch, Pruyn & Co. was sold to a new entity, Finch Paper Holdings LLC, owned by an investor group led by Atlas Holdings LLC and Blue Wolf Capital Management LLC. Finch Paper Holdings LLC retained ownership of the



**Figure 3.2** Median household income in Adirondack towns. Income data estimated to 2008 dollars based on data provided by the U.S. Census Bureau (2000). Map: Andrew Roe, Cornell University.

Glens Falls mill, but sold the lands to TNC. In 2008, TNC, the New York State Department of Environmental Conservation (NYSDEC) and local communities developed a plan to manage the lands as a combination of publicly protected areas, private lands available for continued timber harvesting, and community development projects. According to a fact sheet released by NYSDEC and TNC (2008), the objectives of the management plan were to:

- Preserve the ecological integrity of the forests and waters and the diverse array of life they sustain
- Allocate portions of the land to community enhancement projects like snowmobile connector trails and affordable housing
- Keep much of the land working for the timber industry by protecting tens of thousands of acres through conservation easement
- Transition to a long-term ownership that would ensure real property tax payments continue
- Preserve traditional recreational uses on the bulk of the property
- Create new public recreational opportunities

The decisions about how to own and manage the lands were informed by a planning process conducted by TNC and NYSDEC. This process included rapid biological inventories to identify the location of rare or unique species and plant communities. It also included consultations with recreation groups and local town officials in order to solicit input and obtain approval for lands proposed to become public Forest Preserve.<sup>4</sup> In 2009, 37,000 ha were sold to a financial investor, ATP Timber Invest, for \$32.9 million, subject to a conservation easement restricting subdivision and development.

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<sup>4</sup> Laws in New York require local towns to approve of the use of state funds to purchase land in the Adirondacks, if the lands are not already part of the state's Open Space Plan. Some of the former Finch Pruyn lands were included in the Open Space Plan; approval was nonetheless sought for all the proposed state purchases.

The easement also requires the landowner to comply with sustainable forest management standards, such as those outlined by the Forest Stewardship Council. TNC plans to transfer the conservation easement to the state of New York. The arrangement also included a fiber supply agreement, under which TNC and the new landowner are obligated to provide pulp wood to the Finch Paper mill for up to 20 years.

It is anticipated that New York State will purchase approximately 26,000 ha of the remaining lands for public Forest Preserve. This transfer was delayed due to a state budget crisis and political disagreements about new state land purchases in New York (Nearing 2010). In addition to the easement and Forest Preserve lands, approximately 400 ha will be sold to local municipalities for community development projects, and there is a planned expansion of a snowmobile trail network, intended to support the winter recreation economy in the region. Existing recreational leases on the private lands, held primarily by hunt clubs, are expected to be maintained; those on lands that become public will be phased out over time.

In press releases about the land sale and subsequent management plan, representatives from the organizations involved spoke of multiple environmental, and socioeconomic benefits of the transaction, including benefits for local communities. For example, NYSDEC Commissioner Pete Grannis said, “This agreement strikes a balance among environmental, economic and outdoor recreation needs. It incorporates what local communities told us was important to them.” The Finch Pruyn transaction was also praised in the regional and national media, including the New York Times (“A Deal Worth Cheering,” New York Times Editorial Staff 2007) and the Adirondack Explorer (“Deal of the century,” Brown 2007). While the majority of the press was positive, local media sources reported concerns about negative effects of the land sale on traditional forms of recreational use (“Finch Pruyn sale marks end of an

era,” Mann 2007). In the three years following the sale, the global economic recession drove a state budget crisis, intensifying public debate about state land purchases in the Adirondacks (Nearing 2010). Political and media debates like these fuel the flames of existing conflicts about forest land use in the region.

### ***3.4 Results: Alignment of Management Goals with Montreal Process Criteria & Indicators***

Stated management objectives for the former Finch Pruyn lands directly address four of the seven Montreal Process criteria (Table 3.1). For example, the conservation easement, which structures management of the 37,000 hectares owned by ATP, requires that the owners “Maintain or enhance biological diversity,” “Maintain soil productivity,” and “Protect or enhance water quality,” and establishes no-cut areas near waterways and known locations of significant plant or animal species. These directly address criterion one, “Conservation of biodiversity,” and criterion four, “Conservation and maintenance of soil and water resources.” Objectives outlined in the forest management plan, which also encompasses the ATP lands, include maintaining “a forested landscape with diverse forested types and conditions that produce a yield of forest products consistent with sustainable forest principles” and providing for “a broad distribution of forest age classes, standing dead trees, den and nest trees, and large downed trees,” which directly address criteria two, “Maintenance of forest productive capacity,” and three, “Maintenance of forest ecosystem health and vitality.”

Of the remaining three Montreal Process criteria, two are partially addressed by the Finch Pruyn management objectives, and one is not addressed. Certain aspects of criterion six, “Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies,” are met by stated objectives for the former

**Table 3.1** Alignment of management objectives for the former Finch Pruyn lands with the Montreal Process Criteria and Indicators.

Symbols:

- ++ Criteria that are directly addressed in management objectives
- + Criteria that are mentioned but are not formal management objectives
- 0 Criteria that are not mentioned

Montreal Process Criteria	Fact sheet	Conservation easement	Forest management plan
<b>1. Conservation of biological diversity</b>	++	++	++
1.1 Ecosystem diversity	+	++	+
1.2 Species diversity	+	++	++
1.3 Genetic diversity	0	+	+
<b>2. Maintenance of productive capacity of forest ecosystems</b>	+	+	++
<b>3. Maintenance of forest ecosystem health and vitality</b>	++	+	+
<b>4. Conservation and maintenance of soil and water resources</b>	+	++	+
4.1 Protective function	+	++	+
4.2 Soil	0	++	+
4.3 Water	++	++	++
<b>5. Maintenance of forest contribution to global carbon cycles</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>6. Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies</b>	++	++	++
6.1 Production and consumption	+	++	++
6.2 Investment in the forest sector	0	+	+
6.3 Employment and community needs	++	0	0
6.4 Recreation and tourism	++	++	++
6.5 Cultural, social and spiritual needs and values	+	+	0
<b>7. Legal, institutional and economic framework for forest conservation and sustainable management</b>	+	++	++
7.1 Legal framework (laws, regulations, guidelines)	0	++	++
7.2 Institutional framework	+	+	+
7.3 Economic framework (economic policies and measures)	+	+	0
7.4 Capacity to measure and monitor changes	0	++	+
7.5 Capacity to conduct and apply research and development	0	+	+

Finch Pruyn lands, including ongoing production of forest products and provision of recreational opportunities. Keeping a portion of the lands in production is designed to

maintain some level of forest-related employment. New recreation opportunities, such as the snowmobile trails, are intended to support the winter recreation economy of local communities. The land sales to local municipalities are designed to support local economic development. Criterion seven, “The legal, institutional, and economic framework for forest conservation and sustainable management,” is addressed through national, state, and park environmental regulations as well as the conservation easement, the requirements for sustainable forestry practices, and the plans to transfer some of the lands to become legally protected Forest Preserve.

The stated management objectives do not explicitly address criterion five, “Maintaining forest contribution to global carbon cycles.” Several interviewees pointed out that both managed and unmanaged forests sequester and store some amount of carbon; however one person pointed out that carbon dynamics depend on the harvest level and what the wood is used for. Overall, however, we found relatively high alignment between the stated goals for the former Finch Pruyn lands and the Montreal Criteria for sustainable forest management.

### ***3.5 Results: Alignment of Management Objectives with Interviewees’ Goals***

Overall the interviewees were fairly evenly distributed across a range of orientations and levels of involvement. Interviewees who were directly involved in the transaction were more likely to be environmentally-oriented than interviewees who were indirectly involved, reflecting the nature of the organizations involved (a conservation group and an environmental agency) (Table 3.2). Interviewees who were indirectly involved were slightly more likely to be socioeconomically-oriented than interviewees who were directly involved.



**Table 3.2** Interviewee orientation by level of involvement

<b>Orientation</b>	<b>Level of involvement</b>		<b>Total</b>
	Directly	Indirectly	
Environmental	8	4	12
Socioeconomic	2	7	9
Forestry	4	5	9
Integrated	1	5	6
<b>Total</b>	15	21	<b>36</b>

Collectively, the interviewees identified dozens of goals for the former Finch Pruyn lands and local communities (Appendix 4). Interviewees described a total of 69 goals, of which 32 were socioeconomic goals (e.g., “provide adequate employment,”) 21 were ecological goals (e.g., “protect rare species,”) and 16 were integrated (e.g., “balance economic development and environmental protection.”) Many goals overlapped; for example, goals related to providing general recreation opportunities, providing public recreation opportunities, and developing snowmobile trails. We categorized goals with as much specificity as possible given interviewees’ supporting comments. Thus while the counts of goals are somewhat dependent on the way we split or lump goals, these figures are indicative of the range of interests we encountered.

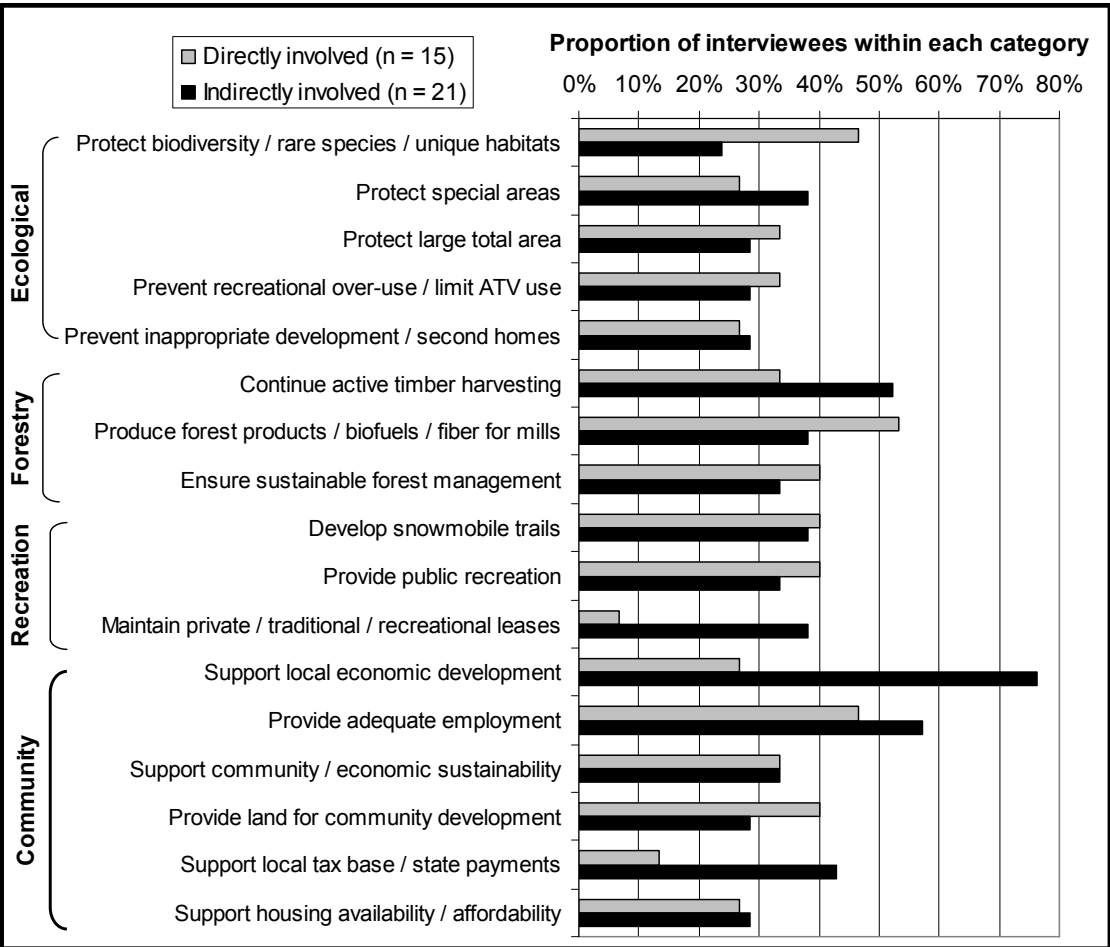
Seventeen goals were identified by nine or more interviewees (representing one fourth of the people we spoke to); these are listed in Table 3.3. For the analysis presented below, we focus on these commonly identified goals.

**Table 3.3** Goals identified most often by interviewees. Includes count and percent of interviewees who identified goals, including percent of interviewees within each category.

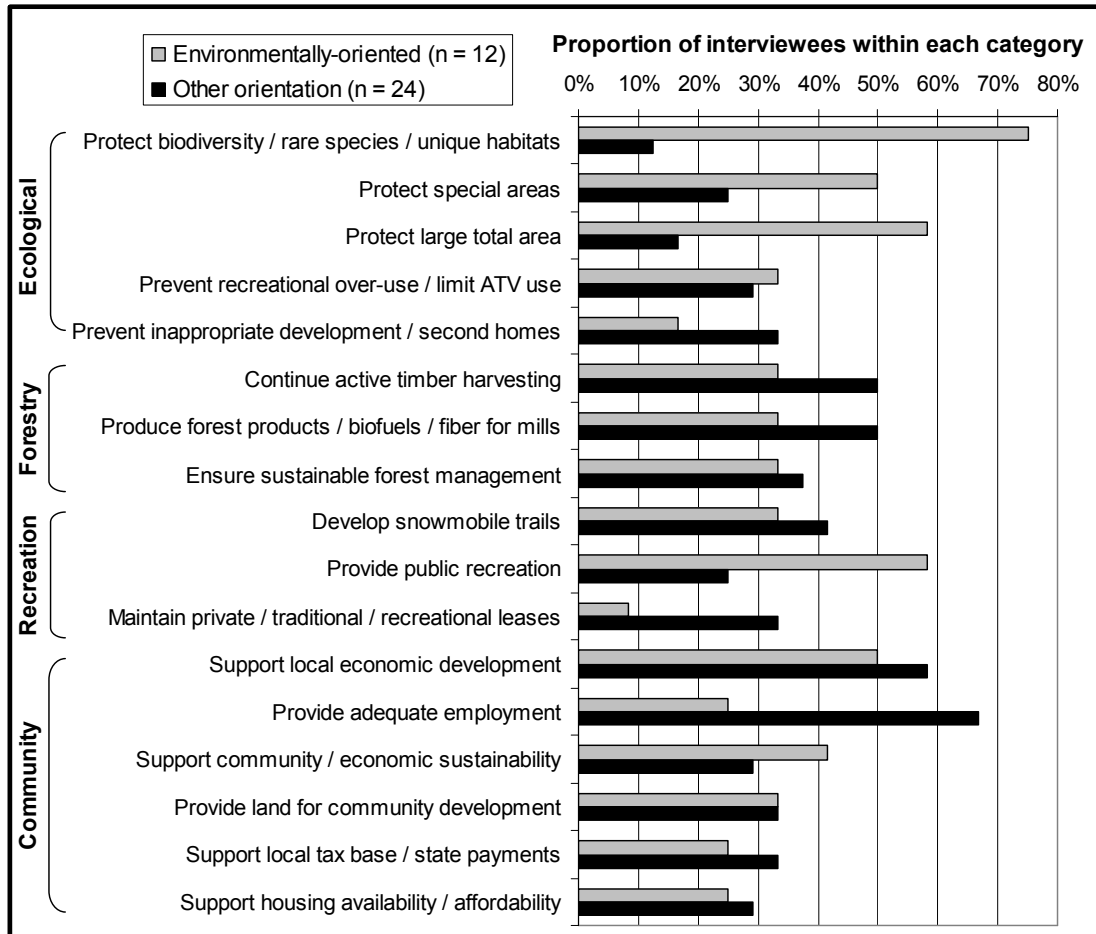
Goal Type	Goal	Interviewees n = 36	Involvement		Orientation			Integ n = 6
			Directly n = 15	Indirectly n = 21	Enviro n = 12	Forest n = 9	Socio n = 9	
Ecological	Protect biodiversity / rare species / unique habitats	12 (33%)	7 (47%)	5 (24%)	9 (75%)	2 (22%)	0 (0%)	1 (17%)
	Protect special areas	12 (33%)	4 (27%)	8 (38%)	6 (50%)	3 (33%)	2 (22%)	1 (17%)
	Protect large total area	11 (31%)	5 (33%)	6 (29%)	7 (58%)	2 (22%)	2 (22%)	0 (0%)
	Prevent recreational over-use / limit ATV use	11 (31%)	5 (33%)	6 (29%)	4 (33%)	3 (33%)	2 (22%)	2 (33%)
Integrated - Forestry	Prevent inappropriate development / second homes	10 (28%)	4 (27%)	6 (29%)	2 (17%)	4 (44%)	1 (11%)	3 (50%)
	Continue active timber harvesting	16 (44%)	5 (33%)	11 (52%)	4 (33%)	4 (44%)	3 (33%)	5 (83%)
	Produce forest products / biofuels / fiber for mills	16 (44%)	8 (53%)	8 (38%)	4 (33%)	5 (56%)	2 (22%)	5 (83%)
	Ensure sustainable forest management	13 (36%)	6 (40%)	7 (33%)	4 (33%)	5 (56%)	1 (11%)	3 (50%)
Socioeconomic - Recreation	Develop snowmobile trails	14 (39%)	6 (40%)	8 (38%)	4 (33%)	3 (33%)	5 (56%)	2 (33%)
	Provide public recreation opportunities	13 (36%)	6 (40%)	7 (33%)	7 (58%)	2 (22%)	1 (11%)	3 (50%)
	Maintain private / traditional / recreational leases	9 (25%)	1 (7%)	8 (38%)	1 (8%)	4 (44%)	2 (22%)	2 (33%)
	Support local economic development / local businesses	20 (56%)	4 (27%)	16 (76%)	6 (50%)	4 (44%)	5 (56%)	5 (83%)
Socioeconomic - Community	Provide adequate employment	19 (53%)	7 (47%)	12 (57%)	3 (25%)	5 (56%)	6 (67%)	5 (83%)
	Support community / economic sustainability	12 (33%)	5 (33%)	7 (33%)	5 (42%)	3 (33%)	3 (33%)	1 (17%)
	Provide land for community development	12 (33%)	6 (40%)	6 (29%)	4 (33%)	2 (22%)	4 (44%)	2 (33%)
	Support local tax base / maintain state payments in lieu of taxes	11 (31%)	2 (13%)	9 (43%)	3 (25%)	3 (33%)	4 (44%)	1 (17%)
	Support housing availability / affordability	10 (28%)	4 (27%)	6 (29%)	3 (25%)	2 (22%)	3 (33%)	2 (33%)

### Ecological Goals

In general, the ecological goals identified by interviewees aligned relatively well with the management objectives for the former Finch Pruyn lands. Goals related to protecting biodiversity, for example, were identified by a broad spectrum of interviewees, but most often by those who were directly involved (Figure 3.3) and environmentally-oriented (Figure 3.4).



**Figure 3.3** Goals identified most often by interviewees, by interviewee involvement. Figure shows proportion of directly and indirectly-involved interviewees who identified each goal.



**Figure 3.4** Goals identified most often by interviewees, by interviewee orientation. Figure shows proportion of interviewees with “environmental” and “other” (forestry, socioeconomic, or integrated) orientations who identified each goal.

For example, an employee of an environmental agency who was not directly involved in the transaction described protecting areas with unique ecological values:

[This transaction] struck a balance of identifying those lands with important resources, be it rare and endangered species, unique habitats, that they be identified and properly protected either through conveyance to the State to become part of the Forest Preserve where there would be presumably no development, [or] subject to a conservation easement that would protect them by requiring no development near those resources, wetlands in particular.

In total, 12 interviewees (both directly and indirectly involved) identified goals related to protecting specific, “special” areas for ecological or aesthetic reasons (Table 3.3).

The interviewees disagreed, however, about the size of the area proposed to be added to the State Forest Preserve. Environmentally-oriented interviewees generally agreed with the current proposal (26,000 ha), or wished to see a larger area transferred (Figure 3.4). Other interviewees disagreed, generally because forest preserve lands would be off-limits to harvesting. For example, a forester not involved in the transaction argued that only selected portions of the land should be preserved, and the rest should remain in timber production:

When I think of special places, special ponds, certain waterfront areas, marshes, the Hudson River Gorge, the [Blue] Ledges, all that sort of area, just beautiful beautiful areas, that I think should be protected. But plain vanilla timberland out a ways, 60,000 acres... keep it as working forest, put an easement on it.

Thus current plans to transfer a relatively large total area to the State align most closely with the goals of environmentally-oriented interviewees. However, this issue doesn't appear to divide people with different levels of influence, as protection goals were identified by both interviewees who were directly and indirectly involved (Figure 3.3).

### **Integrated Goals**

Integrated goals related to forest management came up most frequently (Table 3.3). For example, sixteen interviewees identified goals related to continuing active timber harvesting on a portion of the lands, including interviewees who were both directly and indirectly involved (Figure 3.3), and interviewees with different orientations (Figure 3.4). In the words of an ecologist directly involved in the transaction:

The working forests are a big part [of] the mix on this landscape...I think that good forestry is entirely compatible with both the wild character and ecological integrity of the rest of the park...and I've often been a pretty strong advocate for the need for a healthy timber economy in the park.

An employee of a local public school agreed:

I think that the lands ought to remain in timber production, I think that they've been pretty well managed by Finch Pruyn over the last hundred-some years, and that regardless of what others may think the timber industry is an important segment of this economy... And so I think that keeping the land economically viable beyond just being state land that backpackers and cross country skiers can use is important.

Thus cutting trees, for both ecological and economic reasons, was broadly supported by the interviewees.

### **Socioeconomic Goals - Recreation**

Socioeconomic goals identified most often by interviewees included recreational goals for the former Finch Pruyn lands themselves and economic development goals for local communities (Table 3.3). For example, fourteen interviewees described goals related to expanding the existing network of snowmobile trails, in hopes of bolstering the winter recreation economy of the region. One local official who was not directly involved in the transaction said that this aspect of the proposal was critical to winning local support:

The snowmobile connection was a huge factor for my signing on to this deal, and not putting up the objections that I could have. I think that's probably true of the other six or five [central] towns as well.

Goals related to developing snowmobile trails were identified by a broad range of interviewees. Snowmobiles are considered to have a relatively low environmental impact, as winter use is thought to be least likely to disturb wildlife or damage vegetation. An ecologist who was involved in the deal alluded to the social and economic significance of snowmobiling:

I think there's value to have a vibrant societal and economic system, inside the blue line. I think there's value in having a vibrant recreational community up there, snowmobile trails, large ungulates like to travel on snowmobile trails in

the winter, so... I guess I don't have really strong opinions about how we should handle that.

Interviewees were generally positive about new public recreation opportunities afforded by the Finch Pruyn deal. There was disagreement, however, about the proposal to phase out some of the recreational leases held by private hunt clubs. On lands that become public Forest Preserve, lease holders, some of whom have a long history of using the lands, would lose their exclusive rights of access over a period of ten years. They would also be required to remove or relocate structures such as hunting cabins, and could lose motorized access. Thus this issue was often framed in terms of decreased access. In the words of a local official not involved in the transaction:

It's a sad thing, especially for someone old like my father who's 89, the worst part is not only are they going to destroy his camp but then they're going to close the road so he won't even be able to get in there, like he has in the past. He could probably live with his camp being destroyed, but then to have your access blocked also...

Note that the term "access" can have several meanings. On lands that become Forest Preserve, public access will increase, but private (exclusive) access will decrease. Motorized access will increase in some areas (such as the new snowmobile trails), but could decrease in other areas, depending on which uses are allowed.

Nine interviewees described goals related to maintaining the recreational leases; of these, one was directly involved and eight were indirectly involved. Thus this issue appears to divide people with different levels of influence over land use; those with less influence have more interest in maintaining leases. Interviewees who were directly involved acknowledged the significance of this issue, however. For example, a NYSDEC employee said:

When [the conservation easement] program first rolled out I think the general attitude of our real estate and program people was "I can't justify spending these dollars unless I get full public recreation rights just like it was state forest." But what you come to realize... is that in order to do that you end up

kicking all the private lessees off—who often times are that public, they’re just paying a little for it—and that actually when you kick the 400-500 people off, only maybe 50 of the public will come use it. So you begin to say, “Geez, are we really providing a public benefit, or not?”

Thus there was a recognized tradeoff between public and private recreation goals.

### **Socioeconomic Goals - Community**

Goals related to supporting local communities were identified across the spectrum of interviewees. A Nature Conservancy employee provides one example:

We do have an obligation as a conservation community of doing a really good job of protecting our resources here, because we know they’re not being protected in other places across the globe... But at the same time we need to make sure our communities are sustainable, we live here, we want them to be thriving economically, we want the recreation opportunities to exist, and not juxtapose our conservation work. Healthy communities, healthy ecosystems, in a way that works as best as possible.

While overall community well-being was a shared goal, specific goals related to local economic development were emphasized by interviewees indirectly involved in the transaction (Figure 3.3). Goals related to providing adequate employment were identified more often by interviewees with socioeconomic, forestry, or integrated orientations than by environmentally-oriented interviewees (Figure 3.4). These goals reflect concerns about the current socioeconomic condition of the region. As one local official put it,

I think it’s pretty clear that the incomes are too low, the poverty levels are too high, so I’d like to have some decent paying jobs where people could live here and sustain themselves and not have all the social problems from not having enough income... I wouldn’t want to see a huge influx of people and I think most of the people who live here don’t want to see that, but they want the communities to stay sustainable, viable, and people to have decent paying jobs.

While community goals were often framed in these general terms, in some cases they were tied directly to the former Finch Pruyn lands. Several interviewees pointed to the lands proposed to be sold to local municipalities as potentially supporting local



economic development. Others pointed to tax payments made to local governments. Several interviewees also described goals related to maintaining forestry-related employment. For example, a forester who was not involved in the transaction said,

If you lose more active forest management, more working forest, does it somewhere through the chain eliminate more jobs because a logging contractor... loses land he can work on, does he have to go farther? People in those towns can't drive four hours to get to a job anymore, or have to relocate... That will have economic impact on [local communities] because they're not spending as much, if any, time there, they're not going to have input into the local economy. I can see that as a real problem.

These views were tempered by realism: interviewees who cited employment goals often recognized that the number of forestry jobs in the region are few and have been declining for years. Another local official not involved in the deal said,

I don't know that I see [this deal's effect] one way or the other, but I think... it's only a matter of time before the timber industry in the Adirondacks begins to disappear entirely. It's going to happen, it's sad because there's a lot of people who earn a living [that way], and they're people who don't have a lot of other skill sets... and that's just too bad.

In summary, the management objectives for the Finch Pruyn lands align with a number of the goals identified by a broad range of interviewees, including keeping lands in active production, protecting special areas as Forest Preserve, providing new public recreation opportunities, and providing selected parcels for community development. Interviewees disagreed on the total size of the area proposed to become Forest Preserve and plans to phase out some of the private recreational leases. In cases of disagreement, management plans more closely align with goals identified by directly involved, environmentally-oriented interviewees. A wide range of interviewees cited socioeconomic goals, indicating that these issues are widely embraced within and outside the environmental community. The converse was not true, however; interviewees with socioeconomic, forestry, or integrated orientations were less likely to cite ecological goals (Figure 3.4).

### **3.6 Discussion**

The Finch Pruyn working forest is one of the latest in a series of large, expensive, and politically controversial land deals that aim to reconcile competing interests in environmental protection, timber production, recreation and economic development. As such, it represents a new model for conservation and sustainable forest management, building on both an international discourse on sustainability and a history of social conflict related to land use. While working forest land deals are hailed as “win-win-wins,” the reality is far more ambiguous, raising questions about who the real winners are.

We evaluated how a particular working forest land deal addresses these many competing demands, in a context of complex and evolving political pressures. We found that management objectives for the Finch Pruyn working forest directly or indirectly address many of the internationally agreed-upon criteria for sustainability, including protecting biodiversity, maintaining forest ecological integrity, and supporting multiple social and economic benefits. This indicates that the management plans address multiple ecological and socioeconomic dimensions of sustainability. Management objectives do not address carbon sequestration, an ecosystem service highly relevant to current political discussions about the role of forests in global climate change. However, the relationship between forest management and carbon dynamics is highly complex (for a useful summary see Fahey et al. 2009).

We also found that the management objectives aligned with many, but not all, of the goals expressed in interviews. We found that interviewees generally shared goals related to protecting special areas for ecological or aesthetic reasons. They also agreed on keeping a portion of the lands in active timber production to support some level of forestry-related employment as well as a diversity of forest types. There was also general agreement on the importance of providing new public recreation

opportunities and new areas for community development. All of these elements are reflected in current management plans, thus we can state with some confidence that the Finch Pruyn deal succeeded in addressing many of the relevant ecological and socioeconomic demands placed on it. This speaks to the potential for working forest transactions to reconcile traditionally competing demands of conservation groups, private landowners, and local communities.

Our results also speak strongly to the environmental community's growing attention to socioeconomic issues. Environmentally-oriented interviewees frequently emphasized social and economic outcomes. Other authors have found that socioeconomic considerations are increasingly being integrated in conservation efforts in the Adirondacks and beyond (Klein & Wolf 2007, Adams & Hutton 2007). This reflects political pragmatism on the part of conservation groups, who must address—or at least acknowledge—socioeconomic implications of environmental protection in order to operate in politically contentious contexts. The embracing of socioeconomic issues within the environmental community has deflected some of the longstanding tensions between environmental protection and economic development interests.

Nonetheless, while interviewees often agreed on general goals, they sometimes disagreed on the details. The areas of disagreement highlighted different priorities for land use, as well as different conceptions of the relationship between land use and socioeconomic well-being. Some interviewees, particularly those who were directly involved and environmentally oriented, favored expanding public recreational access and strengthening environmental protections. This reflects assumptions that public recreational users would contribute to local economies, and the long-term provision of ecosystem services would benefit both the region and the planet. Other interviewees favored maintaining the status quo, on the assumption that keeping more land in production would maintain current levels of forest-related employment, and that

continuing private recreational leases would maintain an important cultural tradition and generate income.

Also, while interviewees agreed on general goals related to supporting local communities, those who were indirectly involved tended to be more specific in their demands for economic development, adequate employment and affordable housing. This reflects concerns about socioeconomic well-being in Adirondack communities, and a reliance on the forest industry to address some of these problems. Anxiety about human welfare and disagreements about the role of land use explain why large working forest land deals have received so much attention, both positive and negative.

We agree, however, with the interviewees who pointed out that human well-being is influenced by many factors, including the historical decline of the forestry industry in the region and the current economic crisis. Previous studies have demonstrated that there is no clear relationship between land use and levels of employment, income, or poverty in Adirondack communities (Jenkins & Keal 2004; Keal & Wilkie 2003). It is not necessarily reasonable, therefore, to pin general employment or economic development goals to a single (albeit large) transaction.

Also, while we observed areas of disagreement, they did not consistently divide interviewees with different levels of involvement or different orientations. There are several possible reasons for this: first, our categorization of interviewees may have been overly simplistic, masking significant variation within groups. Future analyses should explore more nuanced ways to group people with interests in working forests. Second, our evaluation of the goals of relevant actors was limited by the number and type of people we spoke to. While we sought to report a wide range of perspectives, some perspectives were necessarily left out. However, we found that interviewees were willing to share their opinions, both positive and negative, and we tried to represent this range of opinion in our results.

Third, many interviewees cited the importance of the local outreach process in helping secure widespread support for the Finch Pruyn deal. This speaks to the importance of process in structuring land deals; in other words, the way decisions are made and presented to local actors may be as important as the nature of the decisions. The importance of communication and deliberation has long been acknowledged in the fields of conflict resolution and politics (Fisher et al. 1991; Gregory et al. 2001). Although investing in local outreach is expensive and time consuming, this effort was evidently critical to the success of the Finch Pruyn deal. This could serve as an important lesson for future working forest transactions.

### ***3.7 Conclusion***

Working forest land deals like Finch Pruyn build on ongoing efforts to integrate conservation objectives and socioeconomic demands on forest lands. However, they also represent a new, relatively untested approach. We see great potential for these transactions to contribute to global and local sustainability goals, and also to help heal the wounds of years of social conflict related to forest land use. While we observed some variation in the goals of different types of interviewees, the areas of agreement appear to be greater than the areas of disagreement. We believe this reflects political pragmatism on the part of the environmental community as well as the benefits of investing in local outreach.

The Finch Pruyn working forest is a noteworthy achievement that grew out of decades of cooperation between the state of New York and The Nature Conservancy. The staff of these organizations invested significant time and resources in the planning process, including an assessment of ecological values and consultation with local leaders, efforts which paid significant dividends in garnering public support. Other conservation organizations, government agencies, forestry companies and local

communities have much to learn from the Finch Pruyn experience in this regard. More work is needed, however, to resolve ongoing uncertainties about the implications of the transaction for forest ecological integrity and local well-being.

Our research helped establish a foundation for identifying goals relevant for international, regional, and local sustainability. We believe more work is needed to ensure the Finch Pruyn working forest fulfills its potential over the long term, and serves as a model for future transactions. Even where management objectives align with ecological and socioeconomic goals, this does not ensure that the objectives will be achieved on the ground. In particular, it is not clear whether New York State will be financially or politically able to purchase all the lands proposed to become Forest Preserve, or to develop proposed recreation opportunities. Even if the State proves able to meet its commitments, it has limited capacity to monitor and enforce the terms of conservation easements on private lands. Furthermore, while the easement was designed to ensure continuity of management on the private lands, that land is likely to change hands in the future, with uncertain implications for forest management practices, forest-related employment, and recreational access.

Working forests must achieve many competing ecological and socioeconomic demands in a context of complexity and uncertainty. Ensuring that ecological and socioeconomic goals are met will therefore require ongoing efforts by all groups involved, additional commitments of public and private funds for forest land protection and management, and periodic evaluation to assess outcomes. The considerable sums of public and private money already invested in working forests merits a corresponding investment in ensuring that the strategy is sound.

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## CHAPTER 4

### DISCUSSION AND CONCLUSION

#### *4.1 Working Forest Land Deals in Context*

Working forest land deals represent a large, expensive, and relatively untested strategy for protecting biodiversity, ensuring sustainable forest management, providing recreational opportunities and maintaining forest-related livelihoods. They take place in a context of social conflict related to forest land use, such as ongoing debates about public land acquisition and private property rights in the Northern Forest, and the emblematic battles over logging in the habitat of the Northern Spotted Owl in the Pacific Northwest. These deals also occur in the context of international efforts to define and promote sustainable management of forests, such as the 1995 Montreal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests, and the 1996 Forest Stewardship Council's (FSC) Principles and Criteria for Forest Stewardship.

Sustainable forestry initiatives were driven by a number of trends, including growing concerns about deforestation and degradation of forest ecosystems, improved understanding of the interconnections within and between ecosystems and human dominated landscapes, the burgeoning environmental movement, and increasing concern for the welfare of people who live, work, and play in and near forests. In general, promotion of sustainable forest management entails incorporating ecological and social goals into existing political and economic frameworks that govern forests. For example, FSC certification criteria seek to integrate ecological principles into commercial forestry operations, in an effort to temper short-term economic objectives

with goals related to long-term sustainable harvests, biodiversity conservation, water quality, recreation, and other forest values.

At the same time, there has been a transition in the conservation movement from a focus on strict protection of parks and preserves to integration of conservation into working landscapes. In some ways, this transition was driven by some of the same trends that drove sustainability initiatives: ongoing environmental degradation, recognition of the interconnections between ecosystems and human dominated areas, and concerns about human welfare. Just as environmental values are increasingly incorporated into economics and policy, social and economic values are being incorporated into conservation efforts.

Working forests are at the nexus of these two paths: an incorporation of ecological and social principles into economics and policy, on the one hand, and an incorporation of economic pragmatism and human welfare considerations into conservation, on the other. As such, working forests have been sold as everything to everyone. They are promoted as capable of providing acceptable financial returns to private landowners and investors through a sustainable timber supply. At the same time, they ostensibly provide the public with ecosystem services including recreation, water purification, carbon sequestration, and habitat for diverse species. An optimistic interpretation of working forests is that they are the best of all worlds, providing a solution for one of the enduring questions facing society: can we manage natural systems to both protect ecological integrity and meet the needs of current and future generations? Investment in working forests appear to be evidence that conservationists are increasingly open to economic and social concerns, while those most concerned about protecting jobs and local economies appear to be more willing to accept the importance of protecting the environment.

A less optimistic interpretation acknowledges that working forest deals have uncertain outcomes. Trees will continue to be cut, with unknown consequences for biodiversity and ecosystem service provision; markets tend to fluctuate, with uncertain consequences for the landowners' economic calculus; and forest resources are finite, thus some people will benefit from their use and others will not. Moreover, forest ecosystems and the people who rely on them are influenced by many external forces, including global climate change, economic trends, and shifting political priorities. In this view, working forests are, at best, unhappy compromises.

Either way, because the transactions involve enormous investments and vast tracts of land, they warrant further study. Because many working forest land deals are so recent, we can only guess at their long-term implications. Given the many competing demands on working forests, the history of social conflict surrounding forest land use, and the inherent complexity and uncertainty they entail, there is a need for ongoing reflective management informed by data collection. Monitoring of key ecological and socioeconomic indicators at relevant scales can support learning, guide adaptive management, and inform the design of future land deals. International criteria such as those outlined in the Montreal Process, as well as regional and local sustainability goals should guide the process.

In this study, we set out to analyze working forests in the context of these larger efforts to define sustainable forest management. Our study consisted of several parts: in Chapter 1, we evaluated how international definitions of sustainable forest management aligned with independent efforts to define forest ecological integrity and socioeconomic well-being. In Chapter 2, we reviewed case studies of monitoring programs developed for working forests, to assess how ecological and socioeconomic indicators were being incorporated into management and policy. In Chapter 3, we conducted a case study of a particular, high-profile working forest to determine

whether management objectives were addressing international, regional, and local sustainability goals.

Our primary findings are summarized below. They are followed by a set of recommended next steps, a discussion of the limitations of the study, and a concluding summary. Additional materials and results are summarized in the Appendices and online: <http://conserveonline.org/workspaces/cornellworkingforest>

### **Indicators of Sustainable Forest Management**

In the first part of our study, we found that existing definitions of sustainable forest management, such as the Montreal Process Criteria and Indicators (MPC&I) and the FSC Principles and Criteria, align with independent efforts to define forest ecosystem integrity. They include ecological indicators related to forest structure, species composition, and natural disturbance dynamics. The MPC&I, however, include only general indicators for “community resilience” and “multiple socioeconomic benefits of forests.” They do not define specific indicators of well-being, such as population and demographic trends, employment and income from various economic sectors, and community capacity.

This asymmetry in defining ecological and socioeconomic dimensions of sustainable forest management reflects some of the complexities inherent in social-ecological systems. For example, the geographic scale at which forests are managed (properties or management units) does not align with sociopolitical boundaries (communities, counties, or states.) Also, the relationship between forest land use and local well-being is heterogeneous and often not well-defined. This implies a need for additional research to improve understanding of the relationship between forest management, ecological integrity, and human well-being at multiple scales.



## **Monitoring of Working Forests**

We found few documented examples of working forest monitoring programs that integrated ecological and socioeconomic indicators. Furthermore, few of the cases we reviewed had frameworks in place to support future monitoring and adaptive management. This severely limits our ability to learn from past experience, improve management of existing working forest lands, or design better transactions in the future. Moreover, the few examples we identified of ecological monitoring of working forests focused on a limited number of metrics that were relatively easy to measure, such as change in forest cover. These indicators are inadequate to assess many ecological values, such as species diversity or aquatic ecosystem integrity. Thus, while working forest land deals are likely to achieve certain conservation objectives, such as reducing fragmentation and conversion of forests to other uses, it is not clear they will meet the full range of ecological criteria for sustainable forest management, such as conservation of biodiversity and protection of water resources.

The few integrated monitoring programs that we found indicated that the relationship between forest management and socioeconomic well-being in nearby communities is complex and influenced by other factors, such as fluctuations in forest products markets, proximity to major transportation corridors, and global economic trends. Thus, while these deals are likely to provide certain benefits in the form of recreation and employment, it is also unclear that they will be able to support the broader social and economic goals that have been ascribed to them, such as stemming economic decline in rural communities. Given the magnitude of the investment in working forest land deals and the many demands placed on them, we see a critical need for greater investment into research and monitoring to support learning, inform management, and improve the design of future transactions.

## **The Finch Pruyn Working Forest**

In the third part of our study, we found that the management objectives for the Finch Pruyn working forest align with many international, regional, and local sustainability goals, including biodiversity conservation, protection of water resources, provision of recreation opportunities, sustainable timber production, and provision of lands for community development. This demonstrates the potential for working forests to address traditionally competing interests in environmental protection, private economic returns, and public goods production. Some management objectives, such as abating threats from development, will be achieved as soon as the deal is finalized. Others, such as protecting rare species or developing new public recreation opportunities, are long-term goals. Furthermore, forest ecosystems and local communities are subject to larger-scale environmental, political, and economic trends. Whether or not particular objectives will be achieved is therefore a question for future studies.

Through interviews, we also examined the goals of actors with different levels of involvement in the transaction and different environmental and socioeconomic orientations. We found that interviewees shared goals related to protecting special areas, continuing active timber harvesting on the rest of the lands, and supporting local communities. Shared goals provide opportunities for managers of working forests to continue to promote land use that addresses multiple goals. They also provide an opportunity for the various interest groups to work together to ensure that management objectives are achieved over time.

While interviewees agreed on general goals, they disagreed on some of the specifics, including the size of the lands proposed to be converted from private ownership to public forest preserve, and the extent to which public recreational opportunities should supplement or replace existing private ventures. These

disagreements highlight current and potential future conflicts for the Finch Pruyn deal and other conservation efforts in the region. Understanding these areas of agreement and disagreement has potential to help the groups involved anticipate and circumvent conflict. The disagreements did not, however, consistently divide actors with different levels of involvement or orientations. This indicates that traditional ways of framing forest land use conflicts may be oversimplified.

This study also highlighted the importance of planning and outreach in building support for working forest land deals. Regardless of their opinion about the Finch Pruyn deal, many of the interviewees commented positively on their engagement with representatives from The Nature Conservancy and the NYSDEC. This speaks to the importance of communication when these large and complex deals are being negotiated. Outreach, although lengthy and expensive, is often critical to garnering long-term support. The Finch Pruyn deal was built on years of cooperation between The Nature Conservancy and New York State, as well as a history of collaboration between environmental organizations, recreation groups, and economic development interests in the region. However, building initial support for the deal was only the first step. Maintaining support will require a long-term commitment and ongoing communication between the groups involved.

#### ***4.2 Recommendations***

Collectively, our analyses led us to make three broad recommendations:

1. *Incorporate more specific indicators of socioeconomic well-being into existing criteria for sustainable forest management.* Existing criteria and indicator schemes treat ecological and socioeconomic indicators asymmetrically. We recognize that human well-being is influenced by factors other than land use. However, specific ecological indicators have been incorporated in definitions of

sustainable forest management, even though forest ecological integrity is also influenced by external factors. Thus we argue for parallel treatment of socioeconomic indicators. This will require additional research on the relationship between forest management and human well-being. It also requires careful selection of socioeconomic indicators that are relevant to forest management (such as employment and income in forestry and recreation) but are also flexible enough to address well-being across heterogeneous socio-political contexts (such as perceived well-being of local residents.) We provide some examples of socioeconomic indicators that have been used in past assessments in Appendix 1 and Table 2.2.

2. *Invest a larger proportion of the funds dedicated to working forests into integrated ecological and socioeconomic monitoring programs.* We see this as critical to addressing lingering questions about the capacity of working forests to simultaneously conserve biodiversity, produce sustainable flows of forest products, support forest-related employment, and provide other ecosystem services such as recreation and carbon sequestration. We recognize that monitoring is not a panacea; there will be lingering uncertainties due to issues of complexity and scale. Monitoring could, however, help address some of the uncertainties about the relationship between forest management, forest ecological integrity, and socioeconomic well-being. It could feed into future management and policy related to working forests and the design of future transactions. We outlined recommendations for future integrated monitoring programs, as well as examples of methods and indicators, in Table 2.2. We also refer to existing guidance on developing efficient, effective monitoring programs (Margoluis & Salafsky 1998) and allocating resources between taking action and measuring outcomes (Salzer & Salafsky 2006).

3. *For the Finch Pruyn working forest, monitor progress towards management objectives in order to inform management and strengthen existing relationships between conservation groups, local communities, and New York State.* As described above, management objectives for the former Finch Pruyn lands already reflect an impressive range of local and global sustainability goals. Understanding whether these goals are met is the next step. A separate component of this study involved identifying monitoring priorities of key actors (Appendices 5 and 6). Monitoring priorities included tracking the status of rare or unique species and natural communities, recreational use levels on new public lands, and associated spending in local businesses.

Some of these indicators, such as the status of rare species on the private lands, will already be monitored under the terms of the conservation easement. Other indicators could be derived from existing data collection efforts; for example, recreational use levels could be estimated based on data from DEC trail registers. Yet other indicators would require additional data collection. For example, the number, type, and expenditures of visitors could be tracked by working with interested local businesses. Such a program could help reduce some of the uncertainties about the ecological and socioeconomic implications of working forest land deals. We also see potential for integrated ecological and socioeconomic monitoring to inform ongoing debates and to support ongoing deliberation among the groups involved.

Depending on the indicators chosen, monitoring would require a relatively modest investment in new data collection. It would, however, require an ongoing investment of time to gather, analyze, and report the information. We are currently working with The Nature Conservancy to establish a baseline of

information and to identify groups who might be interested in participating in future monitoring efforts.

#### ***4.3 Limitations of the Study***

This study provides a review of ecological and socioeconomic goals and indicators that could be used to evaluate outcomes of the Finch Pruyn deal over time. As of this writing, the deal continues to evolve; thus we provide only a snapshot of a working forest in transition. Also, our analysis is built on a relatively small set of existing case studies, many of which are based on recent land deals. This limits our ability to evaluate the effectiveness of this strategy over longer periods of time or in different contexts. Our evaluation of the goals of relevant stakeholders is also limited by the number and type of people we spoke to; while we sought to report a range of perspectives, some were necessarily left out. Nonetheless, we found that interviewees were willing to share their opinions, both positive and negative, and those varied opinions are reflected in our results.

We recognize that this study addresses only a few of the issues pertinent to working forests. Other research could inform the complex institutional and governance arrangements that give rise to these land deals, the value of the goods and services provided by working forests relative to other forms of land use, and the effectiveness of working forests as a conservation strategy. We also recognize that forest ecosystems are complex and dynamic. Our ability to detect change and parse out the effects of management from many other causal forces is limited, even where monitoring data is available. Working forest deals also encompass large areas within diverse socio-political contexts. Our ability to understand the relationship between land use and socioeconomic well-being is challenged by these complexities. Integrated

monitoring could help inform management and policy debates, but many decisions will continue to be made in a context of uncertainty and change.

#### ***4.4 Conclusion***

We see the potential for working forests to simultaneously provide a number of ecological and socioeconomic benefits. However, they cannot be all things to all people. Decisions must still be made about what type of forest management practices and recreational uses to allow or restrict. These decisions have real implications for forest ecological integrity and well-being in local communities. To date, our ability to assess these implications is stymied by limited monitoring budgets and a lack of monitoring programs that integrate ecological and socioeconomic indicators. The Finch Pruyn deal provides a useful case study in which to explore how some of these issues play out over time. We believe that there is an opportunity to address some of the uncertainties surrounding working forests, and to support ongoing deliberations about the relationship between forest management, ecological integrity, and well-being in the region. In this study, we sought to synthesize previous efforts to define sustainable forest management, as well as provide new information and guidance for future working forest transactions and integrated monitoring efforts. We hope our efforts will help support and protect working forests, and the species and people who rely on them, for years to come.

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## APPENDIX

**Appendix 1.** Comparison of several sources of indicators of forest ecological integrity, socioeconomic well-being, and sustainable forest management. Asterisk indicates indicators that cross categories.

Category	Criterion / indicator	Sources of indicators												
		Forest ecological integrity			Sustainable forest management			Socioeconomic well-being						
		Noss 1999	Tierney et al. 2009	The Nature Conservancy	Montreal Process C&I	Forest Stewardship Council	Sustainable Forestry Initiative	Canadian Model Forest Network	Northern Forest Wealth Index	Adirondack Park Regional Assessment				
Forest ecological integrity	Conservation of biological diversity*	X	X	X	X	X								
	Forest ecosystem health*	X	X	X	X									
	Fragmentation / connectivity*	X	X	X	X									
	Age/structural diversity*	X	X	X	X	X								
	Invasive species / pests*	X	X		X	X								
	Tree growth, mortality, regeneration*	X	X		X	X								
	Natural disturbance (fire, storms, pest outbreaks)*	X		X	X	X								
	Rare or threatened species				X	X								
	Protection of soil & water resources*				X	X								
	Forest contribution to global carbon cycles				X									
	Air quality / pollution*	X	X											
	Water quality*				X									
Land use														
Protected areas*				X	X									

Category	Criterion / indicator	Sources of indicators													
		Forest ecological integrity			Sustainable forest management			Socioeconomic well-being							
		Noss 1999	Tierney et al. 2009	The Nature Conservancy	Montreal Process C&I	Forest Stewardship Council	Sustainable Forestry Initiative	Canadian Model Forest Network	Northern Forest Wealth Index	Adirondack Park Regional Assessment					
Sustainable forest management	Productive capacity of forests*				X	X		X							
	Harvest level / harvest relative to growth*				X	X		X		X					
	Compliance with laws & regulations				X	X		X		X					
	Prevention of illegal logging					X		X		X					
	Efficiency & waste of harvest practices					X		X		X					
	Investment in the forest sector							X							
	Production & consumption of wood products*				X	X				X			X		
	Manage the impact of harvesting on visual quality									X					
	Forest-related monitoring				X	X				X					
	Forest-related research				X	X				X					
	Forest management plan					X				X					
	Inclusion professional foresters														
Public participation in forest planning							X	X		X					

Category	Criterion / indicator	Sources of indicators										
		Forest ecological integrity			Sustainable forest management			Socioeconomic well-being				
		Noss 1999	Tierney et al. 2009	The Nature Conservancy	Montreal Process C&I	Forest Stewardship Council	Sustainable Forestry Initiative	Canadian Model Forest Network	Northern Forest Wealth Index	Adirondack Park Regional Assessment		
Socio-economic well-being	Employment level								X		X	
	Employment in forest sector*				X	X		X	X			
	Employment in recreation & tourism								X			
	Unemployment level							X			X	
	Income / livable wage							X	X		X	
	Poverty / public assistance								X			
	Worker's health and safety					X						
	Local businesses									X		X
	Local control of financial capital									X		
	Access to services								X			X
	Infrastructure – roads									X		X
	Infrastructure – water / sewer											X
	Infrastructure – utilities											X
	Infrastructure – telecommunications										X	X
	Cultural, traditional, historical institutions								X	X		X
Recreation & tourism opportunities*					X			X	X		X	
Recreation impacts		X										

Category	Criterion / indicator	Sources of indicators														
		Forest ecological integrity			Sustainable forest management			Socioeconomic well-being								
		Noss 1999	Tierney et al. 2009	The Nature Conservancy	Montreal Process C&I	Forest Stewardship Council	Sustainable Forestry Initiative	Canadian Model Forest Network	Northern Forest Wealth Index	Adirondack Park Regional Assessment						
Socio-economic well-being (continued)	Clear property and land use rights				X	X										
	Indigenous peoples' rights				X	X				X						
	Population / demographics								X						X	
	Seasonal residency														X	
	Human health								X							
	Crime/safety								X							
	Housing availability / affordability											X				
	Education & schools											X				
	Social engagement / voter participation											X				
	Local government expenditures and revenues															X
	Cultural, social and spiritual values of forests				X	X										
	Personal connection with landscape											X				
	Community resilience				X											
Perceived community well-being / cohesion												X				

## **Appendix 2.** Finch Pruyn Working Forest Research Project Interview Guide

### **I. Introduction:**

I'm Rachel Neugarten, from the Cornell Department of Natural Resources. (*Provide business card.*) I am conducting research on forests and the priorities that people have for them. I am specifically interested in the former Finch Pruyn lands. The results of this research will be shared with my research team (which consists of myself, faculty from Cornell, and staff from The Nature Conservancy), public policy makers, and people like yourself involved in land management, the environment, and local communities. We also plan to publish our results in a scientific journal.

I would like to ask you a set of questions about the Finch Pruyn project and local communities. Your participation is completely voluntary. Your name will not be used in the study. A copy of the results will be sent to you if you choose. If you have any questions now or at any time, or would like to stop the interview for any reason, simply let me know and we will stop.

Do you understand what I am proposing?

Do you have any questions?

**Do you agree to participate? Interviewer checks one: \_\_\_ Yes \_\_\_ No**

I would like to use a digital voice recorder to record our interview so I can focus on our discussion rather than taking notes, but if you prefer I don't use a recorder, I can take hand-written notes instead.

**Do you give me permission to digitally record this interview?**

**Interviewer checks one: \_\_\_ Yes \_\_\_ No**

You may stop the recording at any time during our conversation by simply asking me to turn off the recorder.

### **II. Context**

1. Where do you live?
2. How long have you lived there?
3. What do you do for a living?
  - a. For representatives from institutions / civic groups – what is your institution's mission?
4. What kind of recreation do you take part in, in the Adirondacks?
5. What do you know about the Finch Pruyn project?
6. What was your role (if any) in the Finch Pruyn project?

### **III. Goals**

1. What are some important outcomes for this project?
  - a. What is your overall vision, or goals, for the Adirondacks?
  - b. For Adirondack communities?
  - c. How do you see this agreement contributing to that vision?
  - d. How will we know if we are successful in achieving that vision?
  - e. What are the biggest opportunities?
  - f. What are the biggest challenges?

### **IV. Monitoring**

1. You say you feel \_\_\_\_ is important, how will we know if we meet those goals?
  - a. What questions are important to answer?
  - b. What information is important to collect?
  - c. What is the appropriate geographical scale for tracking the information (local, regional, or global?)
  - d. Is there data available, or will it need to be gathered?
  - e. Who should do it?
  - f. What is a reasonable cost?
  - g. What should happen with the information?
    - i. Who should it be made available to?
    - ii. How do you see the information used to inform policy?

### **V. Process**

1. What are some of the strengths of this project? (What worked well?)
2. What are some elements that could be improved, for future projects? (What didn't work well?)
3. What kinds of information would help make future projects successful?
4. To what degree are your interests represented by this project?

### **VI. Ranking indicators**

*(Separate document)*

### **VII. Misc.**

1. Was there anything we didn't talk about that you'd like to address?
2. Who else should I speak to?
3. If you would like a copy of the results of this survey, please provide your address:

### Appendix 3. Finch Pruyn Working Forest Research Project Questionnaire

#### **Introduction:**

There are many different kinds of information that could be collected to evaluate the Finch Pruyn project, including environmental, forestry, economic or social data. We are interested in what kind of information you think is most important to collect. Your answers will be compared to those of other people in the region, to help us understand your priorities for research and monitoring. Your name will not be used in the study.

Please answer all these questions with regards to the former Finch Pruyn lands, if you are familiar with them. If that is too specific, please answer based on your opinion of the forests of the Adirondacks in general.

**Please indicate if you plan to answer the questions in terms of:**

**The Finch Pruyn lands:** \_\_\_\_\_

**The Adirondacks in general:** \_\_\_\_\_

**Part 1:** What kinds of information are most important to collect about the Finch Pruyn agreement? If you had 100 points, how would you allocate those points to each of the below categories?

For example, you could allocate 25 points to each category, or more points to the categories of information you think are more important to collect.

Some examples are included.

Category	Points	Examples
<b>I. Environmental</b>		<ul style="list-style-type: none"> <li>• Forest ecosystem health</li> <li>• Protected areas</li> <li>• Health of streams and lakes</li> <li>• Rare or threatened species</li> </ul>
<b>II. Forestry</b>		<ul style="list-style-type: none"> <li>• Productive capacity of forest</li> <li>• Forest products industry</li> <li>• Sustainable harvest practices</li> <li>• Jobs &amp; wages in forest sector</li> </ul>
<b>III. Economic</b>		<ul style="list-style-type: none"> <li>• Local &amp; regional economy</li> <li>• Jobs &amp; wages in recreation sector</li> <li>• Poverty and unemployment</li> <li>• Tax base</li> </ul>
<b>IV. Social</b>		<ul style="list-style-type: none"> <li>• Education</li> <li>• Recreation</li> <li>• Cultural, historical, or spiritual values</li> <li>• Infrastructure (roads, internet)</li> </ul>
<b>TOTAL</b>	<b>100</b>	



**Part 2:** Within each of these categories, please indicate how you would allocate points to these four sub-categories. For example, you could award 25 points to each sub-category, or more points to sub-categories you think are more important.

Category	Sub-category	Points	Examples
I. Environmental	1) Forest ecosystem health		<ul style="list-style-type: none"> <li>• Area of different forest types and age classes</li> <li>• Number and status of native forest species</li> <li>• Forest fragmentation</li> <li>• Insect pests &amp; disease</li> </ul>
	2) Protected areas		<ul style="list-style-type: none"> <li>• Publicly protected areas</li> <li>• Private forest reserves</li> <li>• Conservation easements</li> </ul>
	3) Health of streams, lakes and wetlands		<ul style="list-style-type: none"> <li>• Area / stream length of degraded water bodies</li> <li>• Buffer widths</li> </ul>
	4) Rare or threatened species		<ul style="list-style-type: none"> <li>• Number of forest species at risk</li> <li>• Status of rare species</li> </ul>
	<b>TOTAL</b>		<b>100</b>

Category	Sub-category	Points	Examples
II. Forestry	1) Productive capacity of forest		<ul style="list-style-type: none"> <li>• Annual increment of merchantable wood</li> <li>• Annual harvest by volume</li> <li>• Annual harvest as a percent of net growth</li> </ul>
	2) Forest products industry		<ul style="list-style-type: none"> <li>• Quantity of forest products</li> <li>• Value of wood and wood products</li> <li>• Value of non-wood products</li> </ul>
	3) Sustainable harvest practices		<ul style="list-style-type: none"> <li>• Practices that maintain forest health</li> <li>• Practices that maintain soil and water quality</li> <li>• Practices that maintain wildlife habitat</li> </ul>
	4) Jobs & wages in forest sector		<ul style="list-style-type: none"> <li>• Forest sector employment</li> <li>• Average income in forest employment</li> </ul>
	<b>TOTAL</b>		<b>100</b>

**Part 2, continued:**

Category	Sub-category	Points	Examples
III. Economic	1) Local and regional economy		<ul style="list-style-type: none"> <li>• Deposits in locally controlled banks</li> <li>• Number and types of businesses in the community</li> <li>• Contribution of forest industry to the economy</li> <li>• Contribution of recreation and tourism to the economy</li> </ul>
	2) Jobs & wages in recreation sector		<ul style="list-style-type: none"> <li>• Tourism &amp; recreation employment</li> <li>• Average income in tourism &amp; recreation</li> </ul>
	3) Poverty and unemployment		<ul style="list-style-type: none"> <li>• Per capita income</li> <li>• Food stamp payments, Unemployment</li> <li>• Persons living below poverty line</li> </ul>
	4) Tax base		<ul style="list-style-type: none"> <li>• Property tax rates</li> <li>• State payments in lieu of taxes</li> <li>• Tax policies favorable to long-term sustainable forest management</li> </ul>
	<b>TOTAL</b>		<b>100</b>

Category	Sub-category	Points	Examples
IV. Social	1) Education		<ul style="list-style-type: none"> <li>• School enrollment at all grades</li> <li>• Public education and training programs</li> <li>• High school graduation rates</li> <li>• Bachelor's degrees</li> </ul>
	2) Recreation		<ul style="list-style-type: none"> <li>• Hiking / cross-country ski trails</li> <li>• Miles of canoeing waters</li> <li>• Snowmobile trails</li> <li>• Boat launches</li> <li>• Recreational leases</li> <li>• Number and type of recreational visits</li> </ul>
	3) Cultural, historical, or spiritual values		<ul style="list-style-type: none"> <li>• Visual beauty / scenery</li> <li>• Rural character</li> <li>• Public libraries, local historical societies, community arts organizations</li> </ul>
	5) Infrastructure (roads, internet)		<ul style="list-style-type: none"> <li>• Road conditions</li> <li>• High speed internet access</li> </ul>
	<b>TOTAL</b>		<b>100</b>

**Part 3:** Now, we're interested in your opinion about the current situation. For example, do you think the forests are healthy? Do you think the forest products industry is doing well? Do you think the current education system is doing well?

For each of the sub-categories, please mark an X to indicate how you think it is doing – Poor, Fair, Good, or Very Good.

Category	Sub-category	Poor	Fair	Good	Very Good
I. Environmental	1) Forest ecosystem health				
	2) Protected areas				
	3) Health of streams, lakes and wetlands				
	4) Rare or threatened species				
II. Forestry	1) Productive capacity of forest				
	2) Forest products industry				
	3) Sustainable harvest practices				
	4) Jobs & wages in forest sector				
III. Economic	1) Local and regional economy				
	2) Jobs and wages in recreation sector				
	3) Poverty and unemployment*				
	4) Tax base**				
IV. Social	1) Education				
	2) Recreation				
	3) Cultural, historical, or spiritual values				
	4) Infrastructure (roads, internet)				

\* "Poor" = high poverty and unemployment, "Very good" = low poverty and unemployment

\*\* "Poor" = poorly-supported tax base; "Very good" = well-supported tax base

**Part 4:** Please briefly describe why you responded things the way you did in parts 1-3, or provide any other comments:

**Appendix 4.** Goals identified by interviewees, organized by type (ecological, socioeconomic, or integrated) and by number of interviewees who identified each one. Bold text indicates goals that were identified by nine or more interviewees.

Goal Type	Goal	Count of interviewees
<b>Ecological</b>	<b>Protect biodiversity / rare species / unique habitats</b>	<b>12</b>
<b>Ecological</b>	<b>Protect special areas</b>	<b>12</b>
<b>Ecological</b>	<b>Protect large total area</b>	<b>11</b>
<b>Ecological</b>	<b>Prevent recreational over-use / limit motorized use / limit ATV use</b>	<b>11</b>
<b>Ecological</b>	<b>Prevent inappropriate development / second homes</b>	<b>10</b>
<b>Ecological</b>	<b>Protect wildlife habitat</b>	<b>9</b>
Ecological	Protect water quality / quantity / shorelines	7
Ecological	Protect / maintain ecological integrity	6
Ecological	Prevent fragmentation	6
Ecological	Wilderness / wild character	5
Ecological	More land in state forest preserve	4
Ecological	Protect New York State Environmental Protection Fund	3
Ecological	Keep forest as forest	3
Ecological	Forest / habitat connectivity	2
Ecological	Monitor easement compliance	2
Ecological	Future large-scale conservation	1
Ecological	Protect periphery of Adirondacks	1
Ecological	Water quality - abate threats	1
Ecological	Forest condition - abate threats	1
Ecological	Forest condition - intact canopy	1
Ecological	Forest condition - mature forest	1
<b>Socioeconomic - Community</b>	<b>Support local economic development / local businesses</b>	<b>20</b>
<b>Socioeconomic - Community</b>	<b>Provide adequate employment</b>	<b>19</b>
<b>Socioeconomic - Community</b>	<b>Provide land for community development</b>	<b>12</b>
<b>Socioeconomic - Community</b>	<b>Support community / economic sustainability</b>	<b>12</b>
<b>Socioeconomic - Community</b>	<b>Support local tax base / maintain state payments in lieu of taxes</b>	<b>11</b>
<b>Socioeconomic - Community</b>	<b>Support housing availability / affordability</b>	<b>10</b>
Socioeconomic - Community	Infrastructure - internet connectivity	6
Socioeconomic - Community	Draw people to community	5
Socioeconomic - Community	Involve local communities in decision making and management	5

<b>Goal Type</b>	<b>Goal</b>	<b>Count of interviewees</b>
Socioeconomic - Community	Schools - remain viable	5
Socioeconomic - Community	Income / decent paying jobs / decrease poverty	4
Socioeconomic - Community	Town/regional identity / community character	4
Socioeconomic - Community	Cultural exchange in communities	3
Socioeconomic - Community	Infrastructure / basic services (medical, day care)	3
Socioeconomic - Community	Keep promises to local government	3
Socioeconomic - Community	Volunteer base for emergency services	3
Socioeconomic - Community	Schools – student enrollment	2
Socioeconomic - Community	Housing - retrofit homes	1
Socioeconomic - Community	Create community core / downtown	1
Socioeconomic - Community	Schools - quality	1
<b>Socioeconomic - Recreation</b>	<b>Develop snowmobile trails</b>	<b>14</b>
<b>Socioeconomic - Recreation</b>	<b>Provide public recreation opportunities</b>	<b>13</b>
<b>Socioeconomic - Recreation</b>	<b>Provide more accessible recreation</b>	<b>10</b>
<b>Socioeconomic - Recreation</b>	<b>Provide private / traditional / recreational leases</b>	<b>9</b>
Socioeconomic - Recreation	General recreation	7
Socioeconomic - Recreation	Develop recreation/tourism opportunities	6
Socioeconomic - Other	Profitability / financial goals of Finch Paper	3
Socioeconomic - Other	Profitability of landowner	3
Socioeconomic - Other	The Nature Conservancy comes out whole financially	2
Socioeconomic - Other	Initiate user fees on state Forest Preserve	2
Socioeconomic - Other	Finch Paper - to be a good neighbor	1
Socioeconomic - Other	Maximize returns for investors	1
<b>Integrated - Forestry</b>	<b>Continue active timber harvesting</b>	<b>16</b>
<b>Integrated - Forestry</b>	<b>Ensure sustainable forest management</b>	<b>13</b>
<b>Integrated - Forestry</b>	<b>Maintain or develop forest products / biofuels</b>	<b>11</b>
Integrated - Forestry	Forest health through active management	8
Integrated - Forestry	Continued fiber supply to mills	7
Integrated - Forestry	Initiate harvests on state Forest Preserve	4
Integrated - Forestry	More land in private ownership with easement	3
Integrated - Forestry	Sustain forest products industry / regional economy	3
Integrated - Forestry	Taxes - revisit state forest land taxation policies	1

<b>Integrated - Other</b>	<b>Balance economic development/environmental protection</b>	<b>12</b>
Integrated - Other	Combination of forest preserve and sustainable forestry	5
Integrated - Other	Adirondacks as global model of sustainability	3
Integrated - Other	Protected area - designation as Wild Forest (allow motorized use)	2
Integrated - Other	Depends on goals of new landowner	2
Integrated - Other	Land use informed by science	1
Integrated - Other	Aesthetics	1
<b>TOTAL</b>		<b>69</b>
	<b>Total Ecological Goals</b>	<b>21</b>
	<b>Total Socioeconomic Goals</b>	<b>32</b>
	<b>Total Integrated Goals</b>	<b>16</b>

**Appendix 5.** Indicators identified by interviewees, organized by type (ecological, socioeconomic, integrated, or other) and by count of interviewees who identified each one. Bold text used for indicators identified by nine or more interviewees.

<b>Indicator Type</b>	<b>Indicator</b>	<b>Count of interviewees</b>
Ecological	<b>Ecological inventory / biodiversity</b>	<b>12</b>
Ecological	<b>Effects of climate change</b>	<b>10</b>
Ecological	<b>Impact of recreation use</b>	<b>10</b>
Ecological	Forest carbon sequestration / storage	7
Ecological	Wildlife habitat	7
Ecological	Acid rain	6
Ecological	Invasive species	6
Ecological	Water quality	6
Ecological	Forest condition - pests and pathogens - beech disease	5
Ecological	Forest condition - fragmentation	4
Ecological	Forest condition - pests and pathogens	4
Ecological	Air quality / air pollution	4
Ecological	State funding for environmental protection	4
Ecological	Riparian buffer width	4
Ecological	Conservation easement - compliance	4
Ecological	Forest condition - general	2
Ecological	Forest condition - coarse woody debris	2
Ecological	Forest condition - older seral stage forest	2
Ecological	Forest condition - dead snags	1
Ecological	Forest condition - intact canopy	1
Ecological	Forest condition - stand inventories	1
Ecological	Forest condition - structural diversity	1
Ecological	Fire regime	1
Ecological	Conservation easement – baseline completed	1
Ecological	Conservation easement – presence of easement	1
Ecological	Conservation easement – status of Special Treatment Areas	1
Ecological	Forest buffer for existing protected areas	1
Ecological	Impact of harvesting on species / biodiversity	1
Ecological	Water - availability	1
Ecological	Water - stream habitat quality	1

<b>Indicator Type</b>	<b>Indicator</b>	<b>Count of interviewees</b>
Socioeconomic - Community	Economic contribution of recreation users	17
Socioeconomic - Community	Employment level	16
Socioeconomic - Community	Number of businesses, closures	14
Socioeconomic - Community	School - enrollment	14
Socioeconomic - Community	Demographics / aging population / losing youth	13
Socioeconomic - Community	Presence of basic businesses (gas station/coffee/restaurant) in Newcomb	13
Socioeconomic - Community	Income / wages	12
Socioeconomic - Community	Population	11
Socioeconomic - Community	Housing - availability / affordability	10
Socioeconomic - Community	Effect of economic crisis	9
Socioeconomic - Community	School - closures / consolidation	8
Socioeconomic - Community	Employment – people with multiple jobs	7
Socioeconomic - Community	Infrastructure - internet connectivity	7
Socioeconomic - Community	Economic implications of land use	6
Socioeconomic - Community	Taxes	6
Socioeconomic - Community	Economy - money spent locally	5
Socioeconomic - Community	Employment - private vs. public	5
Socioeconomic - Community	Employment - seasonal	4
Socioeconomic - Community	Employment - with benefits	4
Socioeconomic - Community	Regulations on development	4
Socioeconomic - Community	Seasonal residents	4
Socioeconomic - Community	Driving distance to stores / transportation costs	3
Socioeconomic - Community	Economic contribution of different sectors	3
Socioeconomic - Community	Emergency services	3
Socioeconomic - Community	Employment - local	3
Socioeconomic - Community	Employment - unemployment level	3
Socioeconomic - Community	Land available for development	3
Socioeconomic - Community	Outcomes of community development projects	3
Socioeconomic - Community	Out-of-park property owners	3
Socioeconomic - Community	Schools - general	3
Socioeconomic - Community	Town budget	3



<b>Indicator Type</b>	<b>Indicator</b>	<b>Count of interviewees</b>
Socioeconomic - Community	"Ghost" towns / communities that no longer exist	2
Socioeconomic - Community	Business - limited hours	2
Socioeconomic - Community	Crime rate	2
Socioeconomic - Community	Infrastructure - water/sewer	2
Socioeconomic - Community	Poverty	2
Socioeconomic - Community	School - quality of education	2
Socioeconomic - Community	Dependence on outside resources	1
Socioeconomic - Community	Driving distance to work / commute times	1
Socioeconomic - Community	Housing - permits for renovations	1
Socioeconomic - Community	Schools - GPA	1
Socioeconomic - Community	Schools - graduating seniors who go to college	1
Socioeconomic - Community	Suicide rates	1
<b>Socioeconomic - Recreation</b>	<b>Snowmobile trails (number of new trails / trail connections)</b>	<b>18</b>
<b>Socioeconomic - Recreation</b>	<b>Number of users / visitors</b>	<b>15</b>
<b>Socioeconomic - Recreation</b>	<b>Accessibility of recreation opportunities</b>	<b>10</b>
<b>Socioeconomic - Recreation</b>	<b>New public recreation opportunities</b>	<b>10</b>
Socioeconomic - Recreation	Demographics of recreation users	5
Socioeconomic - Recreation	Campground closures	1
Socioeconomic - Recreation	Social benefits of recreation	1
<b>Socioeconomic – Forest industry</b>	<b>Decline of the forest products industry</b>	<b>14</b>
<b>Socioeconomic – Forest industry</b>	<b>Employment in forestry</b>	<b>14</b>
Socioeconomic – Forest industry	Economic contribution of forest sector	7
Socioeconomic – Forest industry	Demand for forest products / demand for paper	7
Socioeconomic – Forest industry	Mill closures / number of local sawmills	5
Socioeconomic – Forest industry	Forest land / property values	5
Socioeconomic – Forest industry	Production - technological change / mechanization	4
Socioeconomic – Forest industry	Return on investment / profit relative to carrying cost	4
Socioeconomic – Forest industry	Demand for forest products - biofuels market	3
Socioeconomic – Forest industry	Employment at the mill	3
Socioeconomic – Forest industry	Production - logging trucks	3
Socioeconomic – Forest industry	Production - procurement radius at the mill	3

<b>Indicator Type</b>	<b>Indicator</b>	<b>Count of interviewees</b>
Socioeconomic – Forest industry	Demand for forest products - housing market	2
Socioeconomic – Forest industry	Production - forest product use locally / value added forest products	2
Socioeconomic – Forest industry	Production - how much wood makes it to mill	2
Socioeconomic – Forest industry	Production - what wood is used for	2
<b>Integrated - Forestry</b>	<b>Harvest levels</b>	<b>9</b>
Integrated - Forestry	Number of acres in production	8
Integrated - Forestry	Certification by a third party for sustainable forest practices	7
Integrated - Forestry	Forest block size	3
Integrated - Forestry	Production - adverse impact on forests elsewhere	2
Integrated - Forestry	Involvement of forester	1
Integrated - Forestry	Production - rotation length	1
Integrated - Forestry	Aging forest landowners	1
Integrated	Land use - general	4
Integrated	Aesthetic values	3
Integrated	Conservation easement - economic value	2
Integrated	Environmental values / non use values of forest land	2
Integrated	Land use - portion of town that is state land	2
Integrated	Land use - size of Finch Pruyn landholding per community	1
Integrated	Land use - size of zoned lots	1
Integrated	Land use - slope / soils / development potential	1
Integrated	Number of young people involved in environmental issues	1
Other	The Nature Conservancy - local perception of the organization	2
Other	The Nature Conservancy - future conservation projects facilitated	1
Other	The Nature Conservancy - debt paid down	1
Other	The Nature Conservancy - staff turnover	1
<b>TOTAL</b>		<b>117</b>
	<b>Total Ecological Indicators</b>	<b>30</b>
	<b>Total Socioeconomic Indicators</b>	<b>66</b>
	<b>Total Integrated Indicators</b>	<b>17</b>

## **Appendix 6. Finch Pruyn Working Forest Research Project Questionnaire: Results**

### **Introduction**

This study sought to evaluate the ecological, social, and economic goals and monitoring priorities of key actors in the region of the former Finch Pruyn lands. Interview results reported in Chapter 3 focused on interviewees' goals. Interviewees were also provided with a questionnaire which asked them to allocate points across a set of categories derived from the Montreal Process Criteria and Indicators. The questionnaire was designed to solicit information about interviewees' monitoring priorities, as well as their perceptions of current environmental and socioeconomic conditions in the region. Questionnaire results were also used to group the interviewees by orientation (environmental, forestry, socioeconomic, or integrated) for the analysis in Chapter 3.

The questionnaire asked interviewees to allocate points across a set of four broad categories and sixteen sub-categories (Appendix 3.) The four broad categories represent the traditional dimensions of sustainability (environmental/economic/social) and an additional "forestry" category which captures several variables that are specific to forest management. Each broad category contains four sub-categories, such as "Environmental: Forest ecosystem health," "Environmental: Protected areas," "Forestry: Productive capacity of forest," and so forth. In Part 1, interviewees were asked to allocate a total of 100 points to the four broad categories. In Part 2, they were asked to allocate 100 points to four sub-categories within each of the broad categories (for a total of 16 sub-categories.) For example, an interviewee could allocate 25 points to each category, or could allocate more or fewer points to those categories he or she deemed more important. The point allocations were multiplied to get a weighted total for each of the sixteen sub-categories. (For example, if an interviewee allocated 50

points to the “Environmental” category, then 50 points to “Environment: Forest ecosystem health,” the weighted total for the sub-category was 25 points.)

We pilot tested the questionnaires in March 2009, and modified some of the sub-categories for clarity based on feedback. A total of 31 interviewees filled out the questionnaire. Of these, 19 lived within the Adirondack Park boundary and 12 lived outside, and 13 were directly involved in the Finch Pruyn deal (defined as people who worked for one of the organizations who brokered the deal) and 18 were indirectly involved (see Chapter 3 for the reasoning behind this breakdown of interviewees.) Questionnaire results were compiled in Microsoft Excel (Microsoft Corporation 2003) and analyzed using JMP statistical software (SAS Institute Inc. 2008). We compared the responses of all the interviewees, as well as interviewees who were directly and indirectly involved in the Finch Pruyn deal, and park and non-park residents.

### **Parts 1 and 2: Importance of Indicators**

When asked which types of information they thought was most important to collect about the Finch Pruyn deal, on average, interviewees allocated more points to the environmental category than the social category (comparison of means, Tukey-Kramer HSD,  $p = 0.01$ ). There was no statistically significant difference between the average numbers of points allocated to the other categories (Table A1).

**Table A1.** Comparison of mean number of points allocated to the four broad categories. Levels not connected by same letter are significantly different (Tukey-Kramer HSD,  $\alpha 0.05$ ).

<b>Category</b>		<b>Mean</b>	<b>Std Dev</b>
Environmental	A	28.7	15.7
Forestry	A B	25.8	11.3
Economic	A B	26.7	14.9
Social	B	18.7	8.5

In order to group interviewees for the analysis in Chapter 3, we looked at how each interviewee allocated points across the four broad categories. Interviewees who allocated the most points to the “environmental” category were categorized as “environmentally-oriented.” Interviewees who allocated the most points to “forestry” or to a combination of “forestry” and “economic” were categorized as “forestry-oriented.” Interviewees who allocated the most points to economic, social, or both were categorized as “socioeconomically-oriented.” Interviewees who allocated the same number of points across all four categories were categorized as having “integrated” orientations. Five interviewees did not respond to the questionnaire. They were assigned to a category based on their responses to interview questions. As a result of this process, twelve interviewees were categorized as environmentally-oriented, nine as forestry-oriented, nine as socioeconomically-oriented, and six as having integrated orientations. We recognize these categories are a somewhat simplistic way to categorize interviewees’ orientations, nonetheless we found them useful when comparing interviewees’ goals and monitoring priorities.

Within the four broad categories, on average, interviewees allocated more points to the variables “Forestry: Sustainable harvest practices” and “Environmental: Forest ecosystem health” (Table A2). Interviewees allocated fewer points, on average, to the variables “Forestry: Forest products industry,” “Social: Education,” “Social: Infrastructure (roads, internet),” and “Social: Cultural, historical or spiritual values.” There was no statistically significant difference in the average number of points allocated to each of the four broad categories by park and non-park residents, or by interviewees who were directly or indirectly involved in the Finch Pruyn deal. However, there were differences in the average number of points allocated by the different groups of interviewees to several of the sub-categories.

**Table A2.** Comparison of mean number of points allocated to the sixteen sub-categories. Levels not connected by same letter are significantly different (Tukey-Kramer HSD, alpha 0.05).

Sub-category	Comparison	Mean	StDev
Forestry: Sustainable harvest practices	A	10.4	9.4
Environmental: Forest ecosystem health	A B	9.4	6.5
Environmental: Health of streams, lakes and wetlands	A B C	8.1	5.6
Economic: Local and regional economy	A B C	8.0	5.0
Economic: Tax base	A B C	7.8	7.3
Social: Recreation	A B C	6.3	5.5
Economic: Jobs & wages in recreation sector	B C	5.7	4.0
Forestry: Productive capacity of forest	B C	5.7	4.2
Environmental: Protected areas	B C	5.6	4.1
Environmental: Rare or threatened species	B C	5.5	4.6
Forestry: Jobs & wages in forest sector	B C	5.4	3.5
Economic: Poverty and unemployment	B C	5.2	5.3
Forestry: Forest products industry	C	4.3	2.8
Social: Education	C	4.3	3.1
Social: Infrastructure (roads, internet)	C	4.1	2.6
Social: Cultural, historical, or spiritual values	C	4.0	2.5

Interviewees who lived in the park allocated more points, on average, to “Economic: Local & regional economy” (t test,  $p = 0.03$ ) and “Economic: Jobs & wages in the recreation sector” ( $p = 0.03$ ) than non-park residents. This indicates that park residents place more emphasis on the importance of these economic variables than non-park residents. Interviewees who were indirectly involved in the Finch Pruyn deal allocated more points, on average, to “Forestry: Jobs & wages in the forest sector) ( $p = 0.02$ ), “Social: Education” ( $p = 0.05$ ), and “Social: Infrastructure (roads, internet)” ( $p = 0.02$ ) than interviewees who were directly involved. This indicates that deal “outsiders” place more importance on forestry jobs, education, and infrastructure than deal “insiders.”

### **Part 3: Status of Indicators**

Our survey analysis focused not only on priority indicators, but also on participant assessments of their status (is performance good or bad). These are very different constructs: two people might agree that forest ecosystem health is a priority, but disagree on whether the forest is actually healthy. Conversely, people might agree that the ecosystem is healthy, but disagree on whether healthy forests are important.

In general, interviewees gave the highest ratings to variables related to recreation and protected areas, followed by health of streams, lakes and wetlands, rare and threatened species, forest ecosystem health, cultural / historical / spiritual values, sustainable harvest practices, and the productive capacity of forests (Table A3). Variables related to education, infrastructure, and the tax base fell somewhere in the middle. The forest products industry, jobs and wages in forestry and recreation, the local and regional economy, and poverty/unemployment received the lowest average ratings.

Based on a correlation analysis (not shown), we did not observe a relationship between interviewees' rating of the current status of the variables ("status") and the number of points allocated to the variables in the above sections ("importance.") Interviewees who lived within the Adirondack Park gave lower average ratings to "Forestry: Sustainable harvest practices" (t test,  $p = 0.03$ ), "Forestry: Jobs & wages in the forestry sector" ( $p = 0.03$ ), "Economic: Local and regional economy" ( $p = 0.04$ ), "Social: Cultural, historical, or spiritual values" ( $p = 0.01$ ), and "Social: Infrastructure (roads, internet)" ( $p = 0.002$ ) than interviewees who lived outside the park boundary. This indicates that park residents have a lower perception of the current status of sustainable forestry practices, forestry jobs, the local and regional economy, cultural and spiritual values, and infrastructure than non-park residents.

**Table A3.** Comparison of the mean status ratings of the sixteen sub-categories. Levels not connected by same letter are significantly different (Tukey-Kramer HSD, alpha 0.05).

Sub-category	Comparison	Mean	St Dev	Mean Rating
Social: Recreation	A	3.1	0.8	Good
Environmental: Protected areas	A	3.0	1.0	Good
Environmental: Health of streams, lakes and wetlands	A	2.9	0.7	Fair
Environmental: Rare or threatened species	A	2.9	0.5	Fair
Environmental: Forest ecosystem health	A B	2.7	0.7	Fair
Social: Cultural, historical, or spiritual values	A B	2.7	0.7	Fair
Forestry: Sustainable harvest practices	A B	2.7	0.8	Fair
Forestry: Productive capacity of forest	A B	2.5	0.9	Fair
Social: Education	A B C	2.5	0.7	Fair
Social: Infrastructure (roads, internet)	B C D	2.2	0.8	Fair
Economic: Tax base	B C D E	2.2	0.9	Fair
Economic: Jobs & wages in recreation sector	C D E	1.9	0.8	Poor
Forestry: Forest products industry	C D E	1.8	0.6	Poor
Forestry: Jobs & wages in forest sector	D E	1.7	0.6	Poor
Economic: Local and regional economy	D E	1.6	0.6	Poor
Economic: Poverty and unemployment	E	1.5	0.5	Poor

Interviewees who were indirectly involved in the Finch Pruyn deal gave lower average ratings to “Forestry: Productive capacity of forest” ( $p = 0.006$ ), “Forestry: Sustainable harvest practices” ( $p = 0.03$ ), “Forestry: Jobs & wages in the forest sector” ( $p = 0.03$ ), “Social: Recreation” ( $p = 0.001$ ), “Social: Cultural, historical, or spiritual values” ( $p = 0.04$ ), and “Social: Infrastructure (roads, internet)” ( $p = 0.01$ ). This indicates that deal “outsiders” have a lower perception of the current status of variables related to forestry, recreation, cultural/spiritual values, and infrastructure than deal “insiders.” However, indirectly involved interviewees gave higher average ratings to “Social: Education” ( $p = 0.009$ ) than directly involved interviewees.



## **Discussion**

While there was a high level of variation in the number of points interviewees allocated across the categories, the results from the questionnaires indicate that in general, interviewees prioritize indicators related to the environment, the economy, and forestry, and place less emphasis on social indicators. In particular, indicators related to ensuring sustainable forestry practices and the health of forest and aquatic ecosystems were rated as most important, on average, while indicators related to education, infrastructure, and cultural, historical, and spiritual values were rated as least important. A straightforward interpretation of this result is that interviewees prioritize monitoring of environmental quality, give secondary importance to economic variables, and place even less emphasis on social indicators. However, this also may reflect interviewees' perception of a more direct relationship between forest management and ecosystem health, when compared to, for example, schools or roads.

At the same time, it is clear that interviewees consider recreation opportunities and protected areas to be in relatively good condition, while they consider a number of economic variables to be in relatively poor condition.

This is consistent with the dominant perception of Adirondack communities as having relatively high levels of poverty and seasonal unemployment, and economies based primarily on seasonal recreation and tourism. Based on our review of census data (U.S. census 2000) and several socioeconomic assessments of the region (Gavurnik 2008; Jenkins & Keal 2004; LA Group 2009), we found that these perceptions hold for certain of the communities, including the five towns that are located in the central Adirondacks and contain the majority of the Finch Pruyn lands. Many of the other communities have average or above-average levels of employment and lower levels of poverty when compared to similar counties in New York. Also, for some people, relatively poor economic conditions may be balanced or outweighed by

the relatively high quality recreational and environmental opportunities afforded by the region. Regardless, we did not observe a relationship between interviewees' ratings of the importance of the indicators and their perceptions about the current status of the indicators. This indicates that interviewees consider it important to track environmental and economic variables, despite what they think of the current environmental or economic condition.

Looking at the responses of park versus non-park residents, it is clear that park residents place more importance on economic variables, and have a lower perception of the current status of a number of forestry, economic, and social variables than non-park residents. Similarly, interviewees who were indirectly involved (deal "outsiders") placed greater importance on forestry jobs, education, and infrastructure than deal "insiders." They also had a lower perception of the current status of several forestry-related variables as well as recreation, cultural/historical/spiritual values, and infrastructure, but interestingly had a higher perception of the current status of education. This indicates that people that live within the park and deal "outsiders" place greater emphasis, and are more concerned about, forestry and social indicators.

## **Conclusion**

The questionnaire results provide a useful means for comparing the monitoring priorities of interviewees, and also provide insights as to the types of information considered most important to tracking the long-term effectiveness of the Finch Pruyn deal. It is clear that interviewees place importance on environmental, economic, and forestry-related variables such as forest health and sustainable forestry practices. Interviewees who live in within the park and deal "outsiders" place greater emphasis on forestry and social indicators. This information could be used to inform a monitoring framework for the Finch Pruyn deal that addresses the interests and

concerns of a range of stakeholders. It also provides a snapshot of interviewees' perceptions about the current status of a number of variables that are consistent with the Montreal Process Criteria and Indicators. This study was restricted to a relatively small, purposefully selected set of interviewees. Future research could expand the sample to capture the monitoring priorities and perceptions of a larger sample of people in the region, or could repeat the study over a period of years or decades to see how monitoring priorities and perceived status of these variables changes over time.

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