Chapter 7

SOCIAL CONSEQUENCES OF CHANGE

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Introduction

The natural resource professionals are only one voice in the chorus of the social forces shaping the wildland-urban interface. Other voices include powerful and long-time favorites of the American body politic: the American dream of a single-family home produces an endless demand for forested lots; multinational industries strive to generate the profits and materials that fuel America's economic engine; retail stores insist on space to advertise and market their wares; economic development agencies struggle to spread prosperity, growth, and progress; and environmental preservationists seek to protect wild nature for the spiritual, aesthetic, and moral benefits of current and future generations. To be relevant and effective at influencing the form and function of this emerging landscape, natural resource professionals must recognize and influence the social consequences of landscape change. ▶

This chapter begins by reviewing three types of social consequences produced by this emerging landscape: (1) economic, (2) political and regulatory, and (3) community and landowner. We also discuss the challenges and opportunities natural resource professionals face if they are to remain relevant in the wildland-urban interface.

Consequences of Economic Change

The urbanization of forested areas alters the economics of land management. For example, trees become valued more as amenities than as commodities; return from investment comes more from a property's commercial or residential potential than from its soil productivity. Slowing stormwater discharge becomes as valued as recharging water supply; and mitigating urban heat-island effects overshadows habitat needs of wildlife.

Forest Industry

Forest industries provide economic vitality to local economies. Urbanization clearly changes that economy, but it is not clear whether the net change is positive or negative. Some industries and land uses, such as forestry, are constrained by increased regulation and decreased supply. Other new enterprises, such as retail sales, services, and land development, emerge and create new sources of wealth and new values for forests (see chapter 3).

Conventional wisdom suggests that urbanization shrinks the timber supply. Data are sparse. Some estimates suggest that urbanization reduces commercial inventories between 30 and 49 percent (Wear and others 1999); other estimates are less pessimistic (Barlow and others 1998). We do not have a good understanding of the reasoning owners use to decide whether and when to harvest timber or invest in forest management. But we do know that these decisions become more complex in the interface forest because of additional concerns about neighbor and community perceptions, about amenity and environmental consequences of logging practices, and about increased attention given to fire hazard reduction, wildlife habitat creation, and control over visual access (see chapter 6).

> *"The inhabitants of areas surrounding the forests are not willing to allow silvicultural practices to occur in those forests adjacent to their property." Florida*

Similarly, conventional wisdom suggests that parcelization increases harvesting costs and decreases the profitability of timber production. Supposedly, parcelization leads to more regulation, more onerous negotiations among multiple landowners for access, and a greater emphasis on protecting environmental and amenity resources. However, the actual data are still somewhat inconclusive (for example, Kittredge and others 1999). Another common concern is that wood-processing plants might relocate to find cheaper and more reliable timber supplies. The resulting decrease in timber processing capability hurts local forest owners because they face higher costs for transporting timber to mills. As real estate and amenity values exceed income available from timber harvest, further parcelization may be encouraged. There is limited study about any of these issues. The complex factors that influence the supply of and demand for timber make simple conclusions hard to find. It appears, however, that traditional, rural forestry practices of buying, sell-

Figure 7.1
Many employers migrate to the interface following or trying to attract qualified workers.

ing, harvesting, transporting, and processing timber will increasingly struggle for relevance in interface forests (Barlow and others 1998) (see chapter 6).

Nontimber Industry

Nontimber commodity production on interface land is increasingly popular as a means for landowners to supplement their incomes. Because of easy access to markets, "metro farms" generate more revenue per acre than rural land and they "specialize in high-value crops, producing more than two-thirds of vegetable and fruit sales and more than three-fourths of nursery and greenhouse crop sales" (Heimlich and Brooks 1989). Many of these holdings have woodlots that can provide timber for additional revenue. Subdividing and selling small land parcels also generates income. The supplemental income from these and other interface economies can make feasible the continued management of marginally productive forest and agriculture land.

Resource-Dependent Communities

New economies emerge in the interface bringing growth, diversifying employment, and expanding the tax base. Interface residents can commute to employment along surface roads or information highways, bringing their paychecks back to spend at local retail and service businesses. Employers migrate to the interface following or in search of a qualified workforce (Garreau 1991, Johnson and Rasker 1995) (**fig. 7.1**). Taxes on residential properties, merchandise sales, and services, as well as taxes on new information and service industries, supplement tax revenues lost from relocated commodity-producing industries. While urbanization may cause pain by disrupting employment patterns and social networks, many rural communities aggressively seek development opportunities that offer economic growth, improve the quality of life, and provide young people reason to stay in their hometowns (Riebsame and others 1996, Voth and others 1999). Additional information about economic and taxation issues can be found in chapter 3.

Photo courtesy of USDA Forest Service

Figure 7.2
As the urbanizing forest transitions to an urban forest, the costs of planting and maintaining these trees increases, as well as do the perceived benefits of these trees.

Infrastructure Costs and Benefits

The costs of providing roads, schools, water, and related services are higher in urbanizing areas than in either urban or rural landscapes. They are highest in the dispersed development pattern associated with the wildland-urban interface. Parcelization of forested landscapes, therefore, raises an equity question: Who should be taxed or otherwise finance expanding the physical and social infrastructure?

The role of the forest as an environmental infrastructure also changes. The urbanizing forest becomes more valuable because it reduces heat islands and air conditioning needs, slows and absorbs stormwater, and improves air and water quality. Individually, every tree provides benefits and, cumulatively, the forest provides enormous services that can reduce the need for regional power generation stations and equally costly water treatment and processing facilities. As urbanization continues and the interface forest transitions into an urban forest, the perceived benefits from trees change and perhaps increase, as do the costs of planting and maintaining these trees (Dwyer and others 2000) (**fig. 7.2**).

Consequences of Political and Regulatory Changes

Interface forests also differ from their rural cousins in the number and complexity of political issues affecting them.

Multiple Jurisdictions

As human communities grow, they impose more of their structure onto natural communities. With every new jurisdiction comes another planning process and additional stakeholders. Urbanizing forests have overlapping jurisdictional boundaries created by local and State planning entities; fire, water, and soil conservation districts; county and local planning boards; and homeowners associations (see chapter 4).

"No one has a vision for the future. There is fragmentation of everything." Florida

Land management practices and policies often change at property and jurisdictional boundaries, disrupting ecosystem processes and complicating forestry operations that might otherwise cross those boundaries for ecological or economic reasons (Grimm and others 2000). For example, control of insects and fire often requires practices that cross political boundaries.

Increased Regulation

Higher population density increases the potential for neighbors to directly affect one another's quality of life. As a result, regulation of forest and land management practices increases with urbanization. By most accounts, the increased regulation decreases the short-term profit of harvesting timber; estimates vary from several to many percentage points of profit (Kittredge and others 1999). Regulations also may reduce the amount of timber available by restricting how much forest cover must remain after silvicultural operations (see chapters 4 and 6). Enforcing compliance with these regulations requires the public to commit substantial resources (Ellefson and Cheng 1994). A new class of professionals—public regulatory and planning officials as well as consultants to advise private landowners—is created to provide this value-added service. The uncertainty surrounding the future regulatory environment is sometimes blamed for encouraging landowners to harvest sooner, before potentially costly regulation occurs (Johnson and others 1997). Though they are not yet well documented, potential long-term benefits from increased regulation include prolonged and improved environmental conditions. For example, soil productivity is maintained and water pollution is decreased.

Photo by Larry Korhnack, University of Florida

Figure 7.3
New owners and neighbors of interface forests are often motivated and organized to influence natural resource policies and management.

Participation in Land Use Planning

Land use decisions in interface areas generate more controversy and attention than in rural areas, and involve more plentiful and more diverse public participation. There is considerable debate about whether and how newer residents affect public participation in local governance (Lee and others 1990, Smith and Krannich 2000). Typically, newer residents give environmental concerns a stronger voice, at least relative to commodity production concerns. However, research suggests that new and long-time residents differ little in their environmental concerns (see chapter 4). What may differ are the power and ability each group has to express their concerns. New residents tend to have more resources and be less dependent upon local means of production, freeing them to be more critical of the local situation. Some new residents also possess greater skills for manipulating political and media systems (**fig. 7.3**). Consequently, the involvement of new residents sometimes helps long-time residents voice previously muted environmental concerns. Regardless of the cause, the concerns heard by land use planners and managers do change (Voth and others 1999).

Because of urbanization, the decisionmaking process changes. It tends to become increasingly formal as a community grows. The personal contacts of long-time residents may not be available to newcomers as a means to influence land use decisions. To neutralize this advantage, newcomers are more likely to use alliances with national and regional organizations, and to insist on more formal procedures of participation and decisionmaking, such as hearings and impact statements.

New residents may have different needs and preferences for recreation and community services. Community growth increases the amount of land developed and the demand for community resources. New development is often

Photo by Larry Korhnack, University of Florida

Figure 7.4
New interface residents may object to traditional land uses such as forestry or agriculture due to reasons such as increased traffic and mud on roads.

concentrated near sensitive and publicly owned amenities, such as water edges and ridge lines, further increasing the pressure on these amenities and the number of people concerned about them. Some studies find that newcomers are more likely to object to traditional land uses such as forestry and agriculture because they find them offensive or dangerous, or because these uses compete for land with other, preferred uses. Forestry practices produce odor, noise, traffic, pesticide drift and mud on the road, and compete with housing developments and retail stores for the same land (**fig. 7.4**). Traditional, or long-term residents, sometimes object to newcomers because of concerns about trespass, vandalism, and increased regulation brought on by the pressures of population growth. Research findings tend to be case-specific because no two communities are alike (Lee and others 1990).

Property Rights

Growth in interface communities has a profound effect on property rights, on how they are formally defined and enforced, on how they are informally understood and used, on what rights are most important and to whom, and on who has the power to change them. As land use changes, so do practices and understandings associated with that use. What is appropriate and reasonable in a subdivision can seriously conflict with what is appropriate and reasonable where commodity production dominates. For example, running the four-wheeler or "mudder" through the best wetland near one's home may be considered harmless fun in a rural setting, but a punishable violation of both wetland regulations and trespass laws in an urbanized area. Putting a bird feeder in one's yard is something a rural or suburban homeowner might do, but in some suburbs the homeowner would be well advised to check the zoning covenants first. Interface forests tend to see an increase in formal postings, boundary delineation, zoning code enforcement, and remedies to property disputes via legal rather than informal means. Both the rights and the obligations associated with property ownership are treated more formally. Further discussion on private property rights and public attitudes is provided in chapter 4.

> *"We have a very strong sense that if you have a piece of land you can do whatever you want with it, regardless of how it impacts your neighbor. It is your sacred right." Texas*

Landowner Assistance Programs

Some programs attempt to stimulate forest management and reforestation through subsidies of advice, money, and materials to increase acres covered with forest and the supply of timber (see chapter 6). There is evidence that some timber-producing landowners would actively manage for timber even without the subsidy, while nontimber-producing landowners will not harvest timber even with a subsidy. Both types of landowners take the landowner assistance subsidy, but the result does not increase the timber supply (Kluender and others 1999). Whether an assistance program is designed to increase timber output or improve environmental quality, it may not reach many new landowners because program eligibility often requires too large a parcel or too specific a resource output, such as pine timber or a stream buffer. Moreover, the increasing number of new landowners overwhelms the capacity of traditional landowner assistance personnel and programs. New methods are needed to reach these landowners.

Consequences of Community and Landowner Changes

Urbanization brings with it new landowners, as well as changes in community structure and quality of life. As with economics and policy, there are both positive and negative consequences of settling in interface forests.

Changing Management Preferences and Practices

Development of the interface changes the mixture of forest owners, whose preferences and practices may or may not be the same as their predecessors'. For example, private forest landowners increasingly value amenities such as scenery, wildlife viewing, privacy, and recreation (**fig. 7.5**). Of decreasing importance are the income-related values of forests, such as timber, real estate investment, grazing, and hunting leases (Birch 1997). When harvesting does occur, it is often done under more restrictive conditions than in the past. There are fewer verbal agreements and more written contracts, more independent or third-party estimates of volume and stumpage price, more restrictions on what and how trees are harvested, and increasingly specific site restoration requirements. Moreover, landowners are more willing to sacrifice profit from timber production in exchange for improved environmental quality and higher amenity values (Hickman 1983). It seems, however, that parcel size matters. Owners of large tracts of forested land are more concerned with the income-generating potential of their forests. These large-tract landowners still own most private forests in the South, which bodes well for a continued supply of traditional forest products.

Many new forest landowners do not feel membership in the forestry community or a connection to those who manage and harvest timber (Bliss and others 1994, Kuhns and others 1998). Social science surveys show marked similarity between owners of nonindustrial forest land and the general public in their concerns about environmental quality and forest practices, such as being against large-scale clearcutting (Jones and others 1995). Consequently, landowners in the interface may perceive the forestry profession as less relevant and less trustworthy. Professional gardeners and landscape architects may become the primary contacts and sources of information about forest and land management. The rapid turnover of landowners, whose average tenure is just 7 years in some Southern States (Birch 1997), combined with absenteeism, suggest that many may know little about their land and have limited contact with the professionals who traditionally offer management advice. Very few forest owners (only 5 percent by some estimates) have written plans for the management of their forests. Traditionally, forestry advice has been distributed primarily in forest management plans, but these new landowners may not need or want such formal plans.

Photo by Larry Korhnack, University of Florida

Figure 7.5
Private forest landowners increasingly value amenities, such as birdwatching, over income-related values of forests.

"A lot of the people moving into our area are leaving a metropolitan setting. They can sell one acre in the city and come up here and buy ten acres and think they got a bargain price. Locals could not do that." Georgia

Figure 7.6
More frequent contact with nature and less exposure to urban stressors are presumed benefits of moving to the wildland-urban interface.

Photo courtesy of USDA Forest Service

Social Capital and Turbulence

A community's networks, expertise, and shared mutual aid are its social capital. Communities use this capital to solve problems and improve quality of life. New settlers impact this capital. They are often wealthier, better educated, and more politically astute. They may bring resources such as knowledge and money to the local community. They are less concerned about alienating the local institutions on which many long-time residents depend for livelihood. New residents often insist on more formal decisionmaking processes, as previously mentioned. Long-time residents may feel disenfranchised and threatened by these changes, although those who did not share in the previous power structure may support the new methods and directions of community governance (Smith and Krannich 2000). Interface communities can be destabilized by the relatively high percentage of transitory and absentee landowners. Many landowners in high-amenity areas have dual residencies and migrate with the seasons; some may be absentee inheritors or investors with little local loyalty and no regular contact with their neighbors or the landscape. However, long-term residents can be just as transitory (McHugh and others 1995).

"I think the quality of life up here is what they're after. They [urbanites] want to get away from Atlanta—the stress, the traffic, etc." Georgia

Community Infrastructure

Urbanization changes the economy, diversifies employment opportunities, improves access to and quality of health care, creates a better funded and more diverse educational system, and improves the transportation network. Many rural communities seek these changes and offer them as a rationale for rural economic development (see chapter 3). They directly improve residents' quality of life and create incentives and opportunities to keep talented, young adults from moving to more economically thriving locations.

Physical and Psychological Well-Being

The pollution, crime, and stress of urbanized, industrial, and congested areas can create health risks. A persistent explanation for the migration out of urban areas has been the pursuit of cleaner, healthier, saner, and safer lifestyles (Jacobs 1997, Schmitt 1969). Having more frequent contact with nature and less exposure to urban stressors are presumed benefits of settling in the wildland-urban interface, one that society might wish to encourage by facilitating further settlement (**fig. 7.6**). However, increasing population density in interface forests generates urban-like congestion and decreases open green space, degrading the very qualities that motivated migration and, perhaps, encouraging migration to yet more remote areas. Thus, settling forested landscapes increases both the social benefits and the social costs. Finding an acceptable balance between these costs and benefits is an ongoing challenge, and one that does not readily lend itself to scientific analysis because it involves political tradeoffs and because changes in the environment and how it is valued are often unpredictable. Science may help decisionmakers, however, by monitoring these changes and making the consequences of change more obvious.

Visual Amenities

The once unbroken forested horizon is now dotted with houses and streetlights. Perhaps the most obvious consequence of interface development is the mixing of humans with nature and the consequent visible transformation into housing developments of open spaces, agricultural fields, and forested ridges (**fig. 7.7**). Scenic vistas and visually appealing landscapes are valued resources that increasingly dominate management concerns on public and private forests. Federal and State laws, local ordinances, and other mechanisms have multiplied in recent decades to protect scenic views and create scenic easements (Smardon and Karp 1993). Again, research fails to indicate which policy direction is best. Land development increases the aesthetic resource by clearing forests, creating vistas and open spaces, and increasing access to scenery. Land development creates roads, recreation settings, and houses with picture windows from which to view the scenery. Too much development, though, degrades the resource by blocking or altering vistas so that the views are no longer attractive.

Recreation Demand and Supply

Settlement of interface forests impacts the supply of recreation resources. More tracts of smaller size make it more difficult to contact landowners and negotiate use of private land for recreation. Settlement generally decreases access by nonowners to forested locations (see chapters 2 and 6). Increased posting of private land, by contrast, may increase recreational access if it produces formal leases for recreational activities such as hunting (Cordell and others 1993). The increasing parcelization of land means that new owners, and their acquaintances, will have greater access to their land for nature-based recreation activities; however, most Americans do not own land and, thus, do not enjoy this access. Back-country recreation opportunities, such as hunting and enjoyment of solitude, require vast areas over which to disperse people. These opportunities are likely to decrease where ownership density is increasing. By contrast, front-country activities such as bird watching, picnicking, day walks, and drives may increase as access becomes easier. Finally, the increased demand on public and private recreation resources can produce conflict. If newcomers prefer the same recreation activities as long-time residents, then crowding may result. If they prefer different activities, scarce

Photo courtesy of Virginia Department of Forestry

Figure 7.7
One obvious consequence of interface development is the mixing of humans with nature.

resources are likely to be redirected to provide and maintain these new activities, potentially sacrificing the quality of the traditional activities.

Lifestyle changes associated with interface forests also impact the demand for recreation resources. The 2-week summer vacation to distant locations is becoming less popular. It is being replaced by single-day and long-weekend holidays to local attractions (Hornback 1991). Meanwhile, participation in many nature-based recreation activities continues to increase faster than population growth, with wildlife viewing leading the way (see chapter 2). The result is a rather dramatic change in the staffing and management needs of recreation settings. Visitation tends to be distributed year-round rather than seasonally. Because visitors will come from within the region, they are more familiar with specific areas and more discerning. Recreation destinations with lower quality facilities and services lose popularity. In addition to experiencing a different pattern of visitation, recreation sites attract more diverse users (**fig. 7.8**). This trend is not unique to interface areas. The American population is aging and becoming more ethnically diverse, suggesting that future users will prefer a different mix of recreation activities than was demanded by the white, young, middle-class visitors that dominated demand during most of the 20th century, and for whom many of the existing parks and recreation programs were designed (Cordell and others 1999) (see chapter 6).

Figure 7.8
Recreational opportunities are needed for diverse users.

Photo by Larry Korhnack, University of Florida

Needs

Lee's (1984, p. 131) challenge to natural resource professionals almost 20 years ago remains relevant today:

> . . . the problems of managing forests and wild lands on the urban fringe require specialized knowledge and skill that do not currently exist. The manipulation of natural ecosystems to produce a multitude of benefits requires not only scientific knowledge but also the skill to resolve conflicts between competing uses and to integrate a variety of management techniques to achieve special purposes. Foresters are perhaps the most suitable professionals for these tasks. Their general education and training in specialized techniques have enabled them to address complex problems in wild-land management. These same capabilities also suit them for solving problems of converting forest from wood production to residential environments and for continued residential use. The greatest challenge to foresters who seek to solve problems on the urban fringe will be to learn how to become effective agents for local residents, planners, developers, and environmentalist. This challenge will force foresters to rethink the purposes for which lands are managed and to reintegrate those purposes with emerging forms of technology and socioeconomic organization.

New Content and Methods for Outreach

In general, landowners are placing higher value on soil, amenities, wildlife, and other nontimber forest resources. Natural resource advice must change to reflect these new needs. However, new landowners are less trusting and have had less contact with the professionals who traditionally offer forest management advice. The traditional outreach mechanism—the forest plan—is neither familiar nor appealing to the new clientele. Clearly, new methods for communicating with landowners and distributing forestry advice and assistance are needed. The American Nursery and Landscape Association estimates that American households

spend $15 billion or more annually for professional help with their gardens and trees. DeCoster (2000) estimates that this translates into $648 million per year spent on forested homesites. That is more than 12 times the average annual amount of all U.S. Department of Agriculture forest incentive programs. Little of this business presently goes to forest professionals because they generally have not effectively marketed their services to these new forest owners. Forestry professionals need to supply:

♦ brochures, fact sheets, and personal assistance, which may be more effective with this audience than workshops, forest plans, and demonstration projects (DeCoster 2000, Kuhns and others 1998); and

♦ "how to" pamphlets or training sessions. Making these available through home improvement stores may reach more interface forest landowners.

New Skills

Managing the parcelized forest, with its environmental constraints and diverse landowner objectives, requires knowledge and skills that either do not yet exist or are not widely available. Harvesting remains one of the most affordable ways to manipulate vegetation, even if its primary goal is enhancing amenity values such as scenic views, hiking trails, and wildlife grazing areas. In addition, management of wildlife for nuisance control can be as important as management for wildlife viewing and hunting. Bears, deer, and geese destroy vegetation, become disease vectors, interfere with traffic, damage property, and generate fear. Needs include:

♦ small-scale, less-capital intensive, amenity-enhancing forest harvesting technology; and

♦ techniques to manage wildlife pests and amenities as well as fire and disease on small tracts of land.

In addition, natural resource professionals must work effectively with diverse groups. An important and defining characteristic of interface forestry is the large number of stakeholders with diverse interests who involve themselves in management decisions. Forestry practices are now evaluated by multiple parties and subject to the jurisdiction of multiple institutions. Hence, new skills to handle the more complicated contracts and project implementation are needed. Natural resource professionals need:

♦ tools and skills to work with land use planning processes, zoning appeals, public meetings, fire departments, insurance agents, and other public institutions.

New Partners

Natural resource professionals must seek new partners and constituents. If they wish to stem the rising tide of forest fragmentation, natural resource professionals must work with the institutions that create interface forests and have influence over their management. Tax accountants and estate planners should be recruited to influence owners of large forested tracts from which fragmented forests are created. Media that influence migration, such as country living magazines and retirement community promoters, could be targeted with messages about the concerns and practices of natural resource management in interface forests. Similar messages could be shared with State and local agents of economic

development, such as chambers of commerce, Governors' offices, industrial parks, and other groups that try to attract industry and qualified workers into communities. Natural resource professionals should:

♦ target messages for social institutions driving land use change, and

♦ form partnerships with these institutions.

Partnerships might be formed with the professionals who increasingly are primary sources of land management advice for landowners. Examples include the lawn and garden care industry, home and garden stores, landscape architects, land use planners, and suburban homeowner associations. Insurance companies might be persuaded to offer financial incentives for forest treatments that reduce the risk of fire. Water utilities can explain water demands of landscaping. Power utilities can explain benefits of shading. Local municipalities can promote the benefits of retaining tree cover for stormwater management. Distribution of advice, incentives, and best management practices through these conduits may be more effective in reaching the increasing number of landowners. Many new landowners fail to see how traditional natural resource professionals can help them. Natural resource professionals should:

♦ form partnerships with professions and organizations that currently serve interface landowners such as the lawn and garden care industry.

Cooperative and Cross-Boundary Management

Property parcelization need not lead to increased ecosystem fragmentation. A forest ecosystem becomes fragmented when landowners implement different and uncoordinated management objectives. Natural resource professionals need mechanisms that enable and encourage cross-boundary ecosystem management. Several such mechanisms are currently available, but more are needed. Cooperative programs, for example, use funding from public or nongovernment institutions to bring together landowners within a geographic region, such as a watershed, to structure management goals and practices. Typical goals of a cooperative are preservation of wildlife habitat and water storage, which require coordination across vast areas. Partnerships permit economies of scale and solve access problems so that management practices such as burning, spraying, and harvesting become viable (Campbell and Kittredge 1996). Natural resource professionals need:

♦ mechanisms that enable and encourage cross-boundary management.

Setting New Goals and Developing a New Language

Natural resource professionals should resist the urge to declare that all fragmentation and development threaten the "health" and "sustainability" of forests. Many landscape architects and environmental planners believe they are creating healthy and sustainable residential developments. The whole idea of sustainable development and smart growth is built on that premise. The forest means different things to different stakeholders. Similarly, health and sustainability mean different things to different people.

Contemporary forest planning and management involve a large number of stakeholders who think and speak differently about forests and forestry. As a result, the practice of forestry, now more than ever, requires knowledge about the languages, values, and beliefs of these stakeholders. This is particularly true for inter-

face forestry. Controversy about how to manage interface forests is due, in part, to stakeholders' differing ideas about ecology, about the appropriate role of human technology in nature, and about what goods and services forests should provide. People vary in their beliefs about how nature works, about whether nature or humans know best, and about whether management should emphasize timber or biodiversity. These diverse understandings limit the ability of natural resource professionals and State and Federal agencies to manage landscape change and forest productivity. Forestry's language, motivations, sciences, and practices were not developed to address the undertakings and concerns of interface residents. Foresters need:

♦ a new language and conception of forestry; and

♦ new ways to describe the goals of forest management—goals such as sustainable development and residential quality of life.

Conclusion

The social consequences of managing interface forests are considerable in scope and magnitude and certainly comparable in importance to the environmental consequences. There are no clear policy implications, however, because fragmentation produces benefits and costs, winners and losers. While the timber supply may shrink, other economic opportunities emerge and noncommodity values of forests increase. While the amount of fragmented land may increase, many people gain from the improved access to green spaces, employment opportunities, and social services. While planning may become more difficult because of increased interest in and jurisdiction over forest land, the quality of input and the quality of the plans may also improve. One thing is certain: the owners and neighbors of forests are changing, and natural resource professionals need to change if they are to remain effective and relevant.

Social issues, including demographics, migration, economics, and policy, are the primary forces behind the creation of interface forests. Social institutions, including education, regulation, cooperative management, and tax incentives, are the primary mechanisms to manage these forests. Natural resource professionals can work toward three broad goals in interface areas: (1) they can seek to slow fragmentation and preserve contiguous forested areas, (2) they can guide development and fragmentation to maximize benefits and minimize costs, and, perhaps most importantly, (3) they can adapt to the changed landscape and develop new techniques that allow them to practice their crafts. Growth controls and tax incentives slow and direct fragmentation and development of interface forests. However, they are seldom permanent solutions. Demand for housing sites, fueled by the allure of living near nature, enriches landowners who divide and sell real estate. The challenge is to influence how development occurs and to find ways to work in a fragmented forest.

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