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Social and Political Impact of the Southern Pine Beetle

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Keywords

human habitat
impact
political impact
recreation
social impact
ESA
HFRA
NEPA
REIT
TIMO

Abstract

Impact is defined broadly to mean any effect on the forest environment resulting from the activities of the southern pine beetle (SPB). In this chapter we focus on social and political impact. Social impact deals with effects of the SPB on aesthetic, moral, and metaphysical values associated with forests. Two aspects of social impact are investigated: how the SPB affects recreational use of the forest environment, and how the insect affects the human habitat; i.e., the urban/suburban environment. Political impact deals with the effects of the SPB on the forest environment that result in actions, practices, and policies of local, State, or Federal governmental agencies. The mechanism of political impact is the corpus of laws and regulations that have evolved to provide for protection, conservation, and use of public and private forests. Four important acts relating directly or indirectly to SPB political impact are examined: the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Wilderness Act, and the Healthy Forest Restoration Act (HFRA). We conclude with an examination of how corporate taxation laws have affected forest land ownership in the South and the likely consequence on SPB outbreaks in the future.

16.1. INTRODUCTION

In the introduction to Section II of this volume, the term "impact" was defined broadly to mean any effect on the forest environment resulting from the activities of the southern pine beetle (*Dendroctonus frontalis* Zimmermann) (SPB). Assessment of SPB impact is a multidimensional task that involves consideration of economic (chapter 14), ecological (chapter 15), social, and political perspectives. Although partitioning the subject of impact assessment into four compartments is convenient for discussion purposes, distinction among the categories is often fuzzy. Clearly, an SPB infestation creates economic loss to a commercial forest landowner. However, in a forest landscape, the infestation also initiates the process of ecological succession and the recycling of nutrients, creates new habitat for wildlife species, and increases plant species diversity. In an urban setting the infestation could change the aesthetic appearance and utility of a public park. In a suburban setting, infested trees in neighborhoods are unsightly, can result in injury to residents, and are a liability on private property.

Impact assessment is a fundamental component of integrated pest management (IPM) (chapter 29). In the activity dependency diagram for IPM (Figure 29.4), impact evaluation involves a reciprocal interaction with SPB population dynamics and host tree and forest dynamics components. The results of impact evaluation feed directly to the environmental assessment component and ultimately to management decision and execution. This flow illustrates how IPM activities link directly to the upper echelons of the management hierarchy; i.e., forest protection → forest management → environmental management.

In this chapter our goal is to summarize contemporary information on social and political impact of the SPB. Our specific objectives are: 1. to examine impact from a human social perspective and 2. to consider political impacts from a statutory viewpoint. Figure 16.1 illustrates the general organization of topics examined in this chapter. Although economic and ecological impacts have been examined in a research context, the knowledge base on social and political impact is largely qualitative and thereby subjective; i.e., neither topic has been considered as the focus of organized or rigorous social scientific research since the 1970s. Accordingly, the approach in this chapter is similar to that taken by L.O. Howard in his 1930 treatise, *A History of Applied Entomology (somewhat anecdotal)*, in that our examination of social and political impact is "somewhat observational and interpretative." The impacts of insects in forest landscapes and the relations to forest health management were examined in detail by Coulson and Stephen (2006).

16.2. SOCIAL IMPACT

Social (axiological) impact refers to the effects of the SPB on aesthetic, moral, and metaphysical values associated with forests. Coulson and Saarenmaa (chapter 29) distinguish among six types of forest, each varying in the degree of ecological integrity and human intervention (Figure 29.1). Although social impacts are often difficult to express in quantitative terms, they are important to a large number of forest users. Interest in social impacts of the SPB surfaces when the insect affects recreational use of the forest environment or when it disrupts the human habitat. Each circumstance is discussed below.

16.2.1. Social Impact Associated with Recreational Use of the Forest Environment

Forests are used for many types of recreation. The most popular include walking, doing nonconsumptive wildlife activities, biking, sightseeing, nonpool swimming, fishing, family gathering, and picnicking. To define the potential or actual impacts of the SPB on outdoor recreation, it is necessary to consider the basic elements associated with the activity. Clawson and Knetsch (1966) identified five distinctly different phases of outdoor recreation: anticipation, travel, on-site experience, travel back, and recollection. The net effect generated to the recreationist of a single recreation experience is a composite of these phases. The SPB can have an impact on recreation by intervening into one or more of the phases. Negative or positive impacts influence not only the individual(s) involved directly in the recreation activity, but also the service industries that provide the facilities and means for recreation (Leuschner 1980).

Economists working with social scientists have attempted to define social impacts in a precise manner by examining patterns of use of forests. In general, aesthetic values stem from

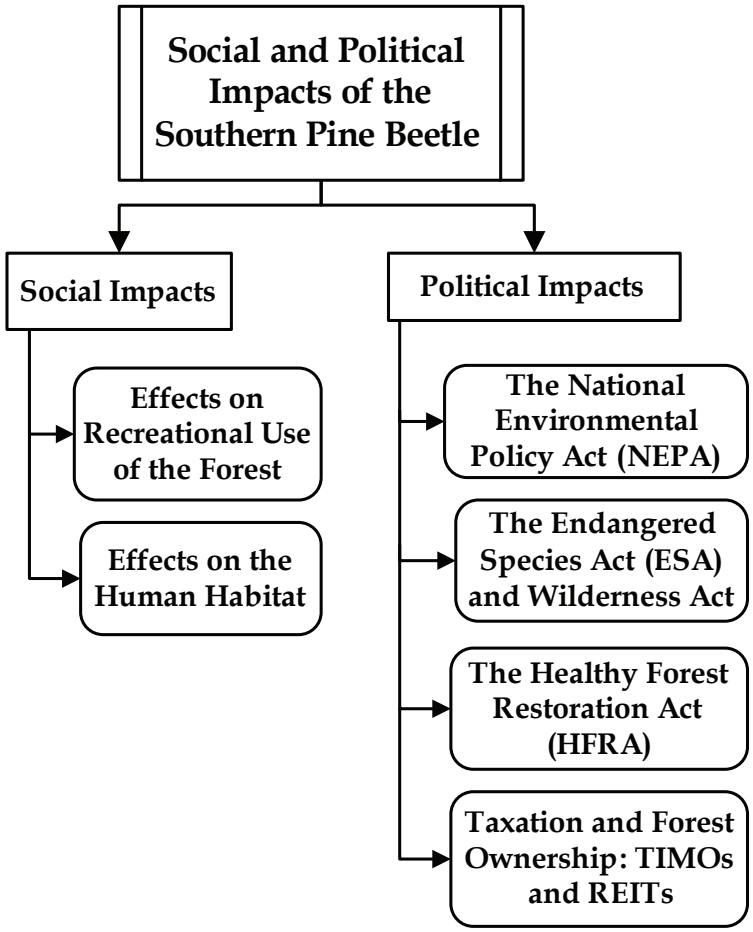

Figure 16.1—Diagram illustrating the organization for this chapter. The discussion considers social impact as it relates to recreational use of forests and effects on the human habitat. Political impact is considered from a statutory perspective.

recreational uses of forest; that is, aesthetic values usually occur in conjunction with other primary activities such as hiking, fishing, and camping. To some degree, which may be very difficult to define, SPB outbreaks can influence the primary activities in both positive and negative ways. For example, infestations may be unpleasant to a hiker, beneficial to a hunter, and inconsequential to a fisherman.

One technique employed by economists in defining social impacts is to measure patterns of recreational use of forests. During or after an SPB outbreak, a recreationist might continue to use a particular site, substitute another site, or no longer recreate (Buhyoff and Leuschner 1978). Of course the type of recreation and degree of distraction created by the SPB outbreak enter into the use pattern (Leuschner and Young 1978). An approach to evaluating social impact is to define human response to the presence of SPB infestations. For example, if a recreationist decided to change campsites because of the presence of an infestation, the added expense to the recreation experience is termed "psychological disutility" (Leuschner and Young 1978, Buhyoff and others 1978). Various motivational factors could influence the decision to change locations; i.e., unsightly appearance of the campsite, presence of dangerous snags, lack of shade, and so forth.

To this point we have emphasized social impacts of the SPB as they relate to individuals physically in the forest and involved in some type of primary activity. Social impacts are also perceived by those individuals who view the forest from a distance. Scenic vistas are often protected and maintained as a part of forest management practice (Buhyoff and others 1979). The importance of scenic vistas is a function of physiography. Areas with substantial terrain relief often provide opportunity for viewing natural landscapes. Generally, SPB outbreaks in coastal plain forests are not an issue, as scenic vistas are sparse. However, outbreaks in mountainous terrain or in the plateau (e.g., the Cumberland and Piedmont) regions of the South are consequential.

In summary, social or aesthetic impacts resulting from SPB outbreaks, although difficult to define in quantitative terms, are important components of the concept of impact. In some cases it is

possible to define social impacts in terms of economic values. This definition is usually based on primary recreational uses of forests. When outbreaks of the SPB occurred in the past, research emphasis was generally directed to topics other than social impact evaluation. The research agenda for social impact of the SPB has not been addressed in a systematic manner, and this subject is in need of rigorous investigation.

16.2.2. Southern Pine Beetle Social Impact on the Human Habitat

We are using the term "habitat" to mean the physical place where humans live. For most people in the Southern United States, this place is the urban and suburban environment of cities. The rapid population growth in the South has resulted in the expansion of the suburban environment of cities into natural forest lands or those established for commercial forest production. Southern yellow pine forests (*Pinus* spp.) are a common backdrop to housing developments in the suburban South. In the urban environment, parks, greenbelts, and recreation areas are often associated with remnant pine forests.

In both the urban and suburban environments, mature pines are particularly valued. Hosts in this state are particularly vulnerable to colonization by the SPB. Furthermore, various types of natural and cultural disturbances associated with the built environment (e.g., road construction, land clearing, site preparation, alteration of drainage patterns, placement of utility conduits, and so forth) contribute to the incidence of the SPB, as they often do in production forests. Research results from investigations of the relation of SPB population dynamics and soil, site, and stand characteristics have been used to develop guidelines for pine arboriculture in urban and suburban settings. Although undefined by objective measure, the guidelines are useful in reducing the effects of disturbances to residual pines in urban and suburban settings and presumably reduce infestation by the SPB. Instructions for identification of the SPB (and associated guild members –see chapter 13) and for application of various control procedures have been prepared by the USDA Forest Service, State Forestry Organizations, and the Cooperative Extension Service.

Nevertheless, infestations of the SPB in urban and suburban forest settings are commonplace during outbreaks of the insect. The social impact of infestations occurring in the suburban environment is of particular interest. This impact can include change in the aesthetic appearance of a neighborhood, reduction in property value resulting from loss of yard trees, reduction of buffering effects on weather conditions, and so on. Individual private landowner responsibilities to the presence of infestations on their property are generally not defined and are largely unregulated. In some instances homeowner associations have intervened to set guidelines. Furthermore, there is ambiguity regarding what constitutes a proper or effective response to the presence of infestations. Although studies of population dynamics have demonstrated how infestations enlarge by colonization of adjacent hosts and that there is contagion among infestations, allegations of cause and effect relations of infestations on adjacent parcels of private property are speculative from a legal perspective.

In general, there is an implied expectation among neighbors that when an infestation occurs, the homeowner is responsible (perhaps obligated) to take some type of action. The range of possibilities runs from application of insecticides to suppress populations of the SPB to the removal of infested trees. These services are provided on a fee basis by arborists or pest control companies. However, there is a range of interpretation of social responsibility among homeowners. Responses by homeowners to infestations on their properties are driven by a variety of issues. In some instances an individual homeowner simply may not have the financial resources to respond to the presence of an infestation. In other cases the homeowner may be apathetic to concerns of neighbors. In still other cases the homeowner may be purposefully spiteful. Again, the social obligations and legal responsibilities for the occurrence of SPB infestations on private as well as public property need further investigation.

In the preceding discussion, we have emphasized social impacts on private property as they relate to neighbors in urban and suburban settings. However, SPB infestations associated with the interface of public to public and private to public ownerships in production forests are also of paramount concern. Many of the same issues identified for private ownerships play out in this public-private arena as well.

16.3. POLITICAL IMPACT

Political impact refers to the effects of insects on the forest environment that result in actions, practices, and policies of local, State, or Federal governmental agencies. The mechanism of political impact is the corpus of laws and regulations that have evolved to provide for protection, conservation, and use of public and private forests (Smardon and Karp 1993). From a forest protection perspective, we are particularly concerned with: 1. Laws that charter and enable governmental agencies (e.g., the USDA Forest Service); 2. Laws that govern forest management practice and policy (e.g., the Wilderness Act); and 3. Laws that regulate inter- and intrastate (and country) movement of plant and animal materials (e.g., the Plant Pest Act). Within the U.S. government a number of departments deal with issues associated with political impact of insects on the forest environment: for example, departments of Agriculture, Commerce, Army, Interior, Labor, and Treasury, and the Environmental Protection Agency. Within the Department of Agriculture, the USDA Forest Service, the National Institute of Food and Agriculture, Natural Resources and Conservation Service, and Animal Plant Health Inspection Service (APHIS) are particularly important (NRC 1998). Within the individual States, there are similar agencies that deal with political impact, such as, the State forestry organizations and departments of agriculture.

In our examination of political impact associated with the SPB, we focus on two aspects of this issue. The first deals with the Federal statutes relevant to impact assessment and response. The second deals with taxation laws relating to industrial management of forest lands. Each of the topics is treated in turn below.

16.3.1. Federal Statutes Relating to Southern Pine Beetle Impact

Numerous U.S. laws govern forest management practice and policy that directly or indirectly involve the SPB. The impact that the SPB has had on forest lands in the South is linked in part to the various models historically used to guide forest management. The history of formal forest management in the United States traces from the 1870s and includes five different models; i.e., dominant-use management; multiple use management; environmentally sensitive, multiple use management; ecosystem management; and landscape management (Yaffe 1999). These models greatly influenced the conditional state of public forest land and how resources were utilized. Coulson and Stephen (2006) examined each of the models and reviewed the basic tenets of the legislation that enabled each approach.

In the following sections we examine four statutes that are particularly relevant to SPB political impact: the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Wilderness Act, and the Healthy Forest Restoration Act (HFRA). The first three of the acts figured prominently in the Federal response to the most recent outbreaks of the SPB. The fourth act, which is the most recent, represents a proactive approach to addressing the cause of catastrophic effects created by wildfires and bark beetle outbreaks.

The National Environmental Policy Act (NEPA)

Impact of the SPB is addressed as a component of environmental assessment. For our purposes environmental assessment deals with evaluating change to the environment resulting from human actions. The substance of environmental assessment is defined by the National Environmental Policy Act of 1969 (as amended) – NEPA. The basic tenets of this act are reviewed by Coulson and Saarenmaa in chapter 29. This act requires that Federal agencies assess the environmental impact of implementing their major programs and actions. For projects or actions that are expected to have a significant effect on the quality of the environment, the responsible agency is required to file a formal environmental impact statement (EIS). Actions associated with suppression and prevention of the SPB clearly fall within "major programs and actions" designation. The EIS is a substantial undertaking and involves the preparation of a document that addresses key issues for a proposed action. The EIS for the SPB (Management Bulletin R8-MB 2) is a massive multivolume document.

Outbreaks of the SPB, which have not in the past been predictable and often cover areas of large spatial extent, are a significant challenge to the environmental assessment processes. When outbreaks occur it is difficult, if not impossible, for the responsible Federal agency to develop an EIS and provide for protection of valued forest conditions or resources in a timely manner; i.e., the need to implement suppression and prevention actions is usually immediate. This dilemma is one of the challenges of forest protection. In addition, the EIS mandate and

procedure applies only on federally managed public land, which represents a minor portion of the pine forest land in the South. On private commercial forest lands, environmental assessment is bundled as part of the certification programs; e.g., SFI®.

The Endangered Species Act and the Wilderness Act

The Endangered Species Act (ESA) of 1973 (as amended) and the Wilderness Act of 1964 (as amended) have factored into SPB impact on Federal forest lands of the South through an unanticipated scenario. Following, we identify important features of each act and illustrate how the SPB became an issue in the decisionmaking regarding compliance to the mandate of these laws.

The ESA was created to provide protection of plants and animals and their habitats identified (listed) by the U.S. government as endangered or threatened. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. Two features of the ESA are particularly important to our discussion of SPB impact. The first feature deals with taking of endangered species; i.e., it is unlawful for anyone to take a listed animal or plant. Significantly modifying the habitat of the endangered species is explicitly included in the meaning of "take." The second feature deals with the responsibility of Federal agencies in protecting endangered species and habitats. This responsibility includes issuing permits for private activities that could affect endangered and threatened species or habitat.

The Wilderness Act provided a new Federal land classification system intended to preserve wild lands in their natural state. The specific definition of wilderness taken from the act is as follows: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." The Wilderness Act initially applied to federally managed lands, such as national forests, national parks, and national wildlife refuges. It also greatly restricted most management practices and means of access; e.g., motorized vehicles and later bicycles were excluded.

The ESA and Wilderness Act came together in a political impact context as a result of the interaction of the SPB and the Red-cockaded woodpecker (RCW) *(Picoides borealis)* on forest lands designated as wilderness. The essence of the management problem centered on the fact that the RCW is a listed endangered species and therefore protected under the ESA. In cases where SPB infestations impinge on colony sites, suppression procedures are implemented on public forest land to protect the bird. However, in some instances RCW colony sites and SPB infestations occur in close proximity within wilderness areas. Normally, when an SPB infestation occurs within a wilderness area, the Wilderness Act prohibits management intervention. The management dilemma centers on whether to protect the RCW from an impinging SPB infestation by implementing suppression tactics or to allow the SPB infestation to follow its natural course and by so doing destroy the RCW colony site. The ESA requires protection of the RCW, and the Wilderness Act prohibits management intervention. The Wilderness Act provides considerable flexibility regarding controlling wildfires on wilderness areas, and this latitude was used to intervene on behalf of the RCW. However, it did not prevent litigation initiated by citizen groups.

The Healthy Forest Restoration Act

The state of the forest environment frequently leads to predictable responses from the agents of change. The Healthy Forest Restoration Act (HFRA) of 2003 is a set of guidelines for directed actions that are intended to adjust (and perhaps regulate) the conditions of the forest environment and thereby alter the frequency and amplitude of natural disturbances (fire and insect and disease outbreaks in particular). Outbreaks of the SPB are often associated with overstocked old-growth pine forests (See chapter 22). Consequently, one means of addressing the depredations caused by the SPB involves a restoration strategy that returns the forest environment to a state where large infestations cannot occur (See chapter 24). The HFRA is intended to guide the restoration processes.

The HFRA has six sections, referred to as Titles. Title IV, which deals with insect infestations and related diseases, is particularly relevant to impact of the SPB. The purposes of this title are: 1. To develop an accelerated basis and applied assessment program to

combat infestations by forest-damaging insects and associated diseases; 2. To engage the stakeholders (including universities, State agencies, and private landowners) to carry out the program, and 3. To implement applied silvicultural assessments. Silviculture deals with the theory and practice of controlling forest establishment, composition, and growth (See chapter 23). The SPB and several other species of forest-damaging insects were specifically identified to be of immediate concern (Coulson and Stephen 2006).

The HFRA is significant in that the intent is to address altering the state of the forest environment in ways that reduce the opportunity for large-scale (broad spatial extent) outbreaks. An ancillary consequence is that the HFRA has stimulated thought into alternative utilization pathways for plant biomass associated with restoration projects as well as natural disturbances; e.g., hurricanes, ice storms, SPB outbreaks, and so forth. Traditional utilization pathways using saw logs and pulpwood are not sufficient, and alternative pathways, particularly bioenergy applications, may offer other profitable uses of forest plant biomass (Curry and others 2008).

16.3.2. Taxation and Political Impact

Taxation laws relating to corporate forest management have substantially changed forest land ownership in the South. The shift of ownership from large industrial companies to nonindustrial private ownership has important implications relating to SPB impact, and this issue is examined below from an interpretative viewpoint. Specifically, we consider: 1. How forest land ownership in the South has changed, and 2. The consequences of changed ownership on SPB outbreaks.

Change in Forest Land Ownership in the South

In the past, the strategy of the large industrial timber companies (often referred to as vertically integrated forest product companies –VIFPCs) in the South was to acquire ownership of forest lands. The rationale for this strategy was that by owning forest land, the company had control over the supply and conditional state of raw materials needed by their manufacturing facilities. Variables such as time of harvest, delivered costs to the mills, tree species, volume, and log size could be controlled if the company owned the source of the raw product; i.e., the forest land. The largest VIFPCs in the South and nationwide have divested their forest land holdings (Figure 16.2). Clutter and others (2005) evaluate strategic factors driving timberland ownership changes in the South. Important questions that follow from this reality are why was the forest land sold, who purchased it, and how is it being managed? Each of these questions is addressed below.

Why was Industrial Forest Land in the South Sold?

There are numerous reasons cited for forest land divestment by the VIFPCs. The most prominent are poor stock performance, the need to increase shareholder returns, debt

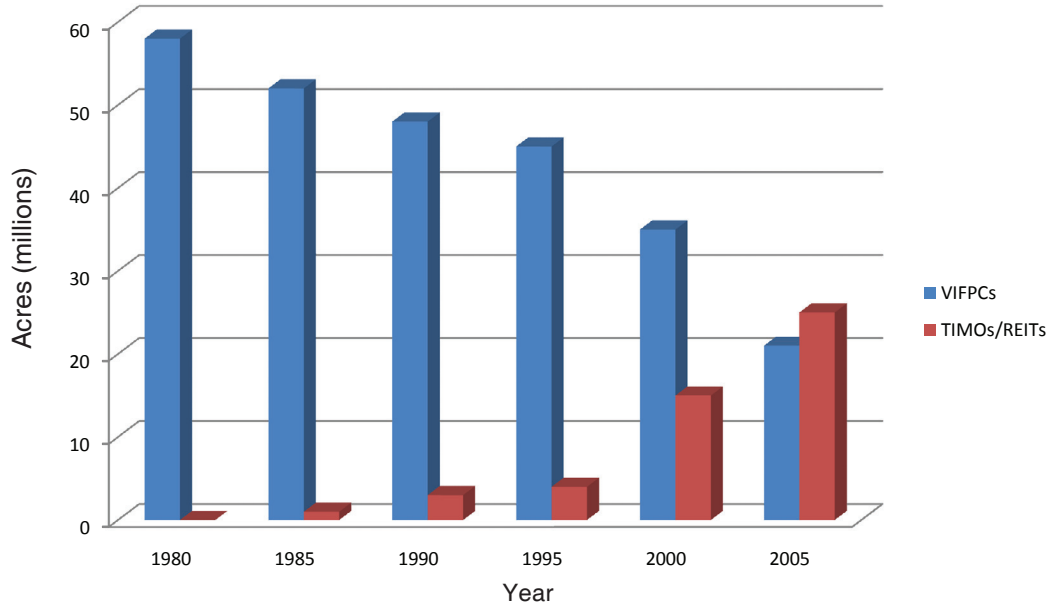

Figure 16.2—Bar graph illustrating the trend in U.S. forest land ownership by TIMOs (Timber Investment Management Organizations) and REITs (Real Estate Investment Trusts) in relation to large industrial timber companies (often referred to as vertically integrated forest product companies –VIFPCs). The Y axis is in millions of acres and the X axis is in years, beginning in 1980 and ending in 2005. The trend is for VIPEC ownership to decline progressively and for TIMOs and REITs to increase in ownership. (illustration from Hickman 2007)

reduction, increased tax efficiencies, and the development of tax strategies that minimize capital gains (Clutter and others 2005). By far the most important driver is taxation. Although a significant concession to simplification, the basic explanation is as follows. If the timber company is classified as a Sub-chapter C Corporation, profits are taxed twice: once at the corporate level by way of a corporate income tax (35 percent) and again at the individual shareholder level if a dividend is declared (15 percent). The practical effect of this taxation policy is that investors who own both the manufacturing plants and forest land often recoup as little as 50 cents out of every dollar of profit made from cutting trees. Investors who own just forest land can normally capture at least 85 cents out of every dollar (Hickman 2007). Consequently, VIFPCs have chosen to restructure in order to separate ownership and control of timber holdings from ownership and control of their mills. Almost all VIFPCs have restructured in this manner (Hickman 2007).

Who Purchased Industrial Forest Land?

The commercially valuable forest land, the property that supplied raw material for use in manufacturing forest products, was in large part acquired by two basic entities:Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs). These entities are classified as Sub-Chapter S and Limited Liability corporations for income tax purposes and are taxed only once. The incentive to restructure and separate timberland and mill ownership is straightforward. Comparatively, each of these entities has unique characteristics. A TIMO buys, manages, and sells forest land and timber on behalf of various institutional investors, such as insurance companies, pension funds, foundations, and endowments. Funds from these sources are invested for the clients for a specified time period, usually 10-15 years. TIMOs have implicit fiduciary responsibility to manage the investment so as to yield the best possible returns; i.e., to maximize profits. TIMOs do not actually own forest land. The forest land is owned by the investors the TIMOs represent. An REIT is an entity that buys, manages, and sells real estate or real estate related assets (such as mortgages) on behalf of private investors. In contrast to TIMOs, REITs own the forest land. Investors are participating in a mutual fund type of instrument (Hickman 2007).

How is Forest Land in the South Being Managed?

The shift in forest land ownership from VIFPCs to TIMOs and REITs was well advanced by 2005 (Figure 16.2). However, empirical evidence for evaluating the impact of this change is currently lacking. Clearly, there is ample incentive for the TIMOs and REITs to manage their forest lands using the best practices available. Both entities employ a small staff of professional foresters, but it is important to recognize that actual "on the ground" management activities are performed by contractors, and all expenses influence the investment return. Unlike VIFPCs of the past, TIMOs and REITs do not possess the large equipment and other resources used in forest management. Among the unanswered questions to be addressed in the future, the following are of paramount significance: what type of forestry will be practiced, given the overarching emphasis for profitable investment; what goods and services, including environmental amenities, will be produced; what will be the relation of ownership tenure and forest land fragmentation; will forest land be converted to other uses; will the new owners be an effective voice for the forestry enterprise in general (i.e., the activities and services performed by the State forestry organizations and the USDA Forest Service)?

The Consequences of Changed Ownership on SPB Outbreaks

The change in forest land ownership from VIFPCs to TIMOs and REITs will likely factor into future regional outbreaks of the SPB. The general investment strategy for TIMOs and REITs centers on convincing clients that land and timber values will increase incrementally over time, and that the trees associated with the forest property can be marketed profitably. The real estate investment component is compelling, but the forest marketing aspect is highly speculative, given that the standing crop of biomass of forest trees in the South exceeds projected demands for traditional wood products (Wear and others 2007). One of the marketing strategies advocated by the TIMOs and REITs is to time timber sales when demand, and hence price, is high. This option was often not possible for the VIFPCs when mill and forest land ownership were bundled; i.e., supply demands of the mills dictated when raw materials were purchased. If waiting for favorable market prices translates into storing mature and overmature trees in the forest

("banking on the stump," in colloquial terms), then the opportunity for herbivory by the SPB is dramatically increased. Recall that most tree mortality attributed to the SPB is associated with mature stands, at least initially. The impact of widespread losses attributed to fire, insects, and disease will have a major effect on market prices for timber. Pye and others (chapter 14) address the economic impact of SPB outbreaks on market value of timber. During SPB outbreaks, markets are swamped with infested wood and prices are greatly depressed. A similar situation occurs following events such as hurricanes and other atmospheric disturbances. Traditionally, forest protection activities on industrial forest land were taken on by the VIFPCs, often in collaboration with the State forestry agencies. There has not been a large regional outbreak of the SPB since land divestment by the VIFPCs, and it is not clear what type of response by the current owners will follow. The State forestry agencies and USDA Forest Service, Forest Health Protection, can provide assistance, but actual suppression and salvage activities on forest land held by TIMOs and RIETs will fall to private contractors. Risk, traditionally associated with forest protection (insects, disease, fire, and other natural disturbances) is not factored into forest real estate investment strategies.

16.4. SUMMARY

We defined impact to mean any effect on the forest environment resulting from the activities of the SPB. Our focus was directed to social and political impact. Neither of these topics has been examined in a rigorous social science context since the 1970s, and our approach has been observational and interpretative. Social impact was examined from two perspectives: The first dealt with SPB impact on recreational use of the forest environment, and the second dealt with the SPB as an element of the human habitat. Political impact was investigated by an examination of selected Federal acts and statutes that influence the actions, practices, and policies of the Federal government. We concluded the section on political impact by evaluating the probable effect of change in ownership of forest lands in the South as a consequence of divestment by the timber industry. The likely effects of TIMOs and RIETs on the potential for future outbreaks of the SPB were considered.