

A COMPARISON OF CALIFORNIA FOREST PRACTICE RULES AND TWO FOREST CERTIFICATION SYSTEMS

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ABBREVIATIONS USED IN THIS STUDY

AF&PA	American Forestry and Paper Association
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CEQA	California Environmental Quality Act
CGS	California Geological Survey
DFG	California Department of Fish and Game
FPRs	California Forest Practice Rules
FSC	Forest Stewardship Council
LTO	Licensed Timber Operator
MSP	Maximum Sustained Production
NTMP	Nonindustrial Timber Management Plan
RWQCB	Regional Water Quality Control Board
SCS	Scientific Certification Systems
SFI	Sustainable Forestry Initiative
SYP	Sustained Yield Plan
THP	Timber Harvesting Plan
TPZ	Timberland Production Zone
WLPZ	Watercourse and Lake Protection Zone

EXECUTIVE SUMMARY

California's private forestlands are afforded some of the most extensive legal protection in the world. Multiple layers of federal, state, county and local regulations ensure that timber will be managed in a sustainable manner. In addition to comprehensive state regulations, some forest landowners voluntarily choose to seek third-party certification by the Forest Stewardship Council (FSC) or the Sustainable Forest Initiative (SFI), entailing a rigorous and expensive evaluation of strict standards by qualified independent auditors who have no vested interest in the forestland in question.

This study investigates how the California Forest Practice Rules (FPRs) and other legal requirements compare to FSC and SFI standards in providing protection to environmental and cultural resources on private forestlands in California. It attempts to not only compare the written standards of each of the three systems, but also attempts to describe how these standards are evaluated in the field. The specific objectives were to:

- Determine how close California state requirements measure up to the forestry standards of the FSC and SFI forest certification programs.
- Compare how the standards of all three systems are evaluated and enforced in the field.
- Evaluate if there are additional requirements needed above state regulations to attain certification by FSC and SFI.

Methodology

A field tour of an FSC-certified forestland and an SFI-certified forestland were conducted. In addition, informational roundtables were held in each of the three California Department of Forestry and Fire Protection (CDF) administrative districts, which were attended by representatives from forest industry, CDF, private consultants, academia, small landowners, certification auditors, loggers and others. Further, written surveys and multiple interviews were utilized to better understand how the three systems are implemented.

This report is the culmination of an extensive review of the written standards of each of the three systems, the many interviews obtained through the previously mentioned endeavors, personal communication with experts on the FPRs and both certification systems, and firsthand observations in the field by the authors.

Major Findings

Why do California Landowners Seek Certification?

Forest landowners in California seek certification for many reasons including:

1. The promise of a premium for certified wood sold at market, which has largely gone unrealized.
2. Increased market share in an increasingly environmentally sensitive marketplace.
 - a) Access to certain markets that intend to exclusively sell wood from certified forests.
 - b) Mitigation of criticism from environmental organizations.
 - c) Means to seek out environmental contacts and engage in constructive dialogue.
 - d) Means to ensure that consulting foresters were indeed doing the exceptional job that they advertised.
 - e) Gain regulatory relief, which has largely gone unrealized.
3. Forest landowners chose their certification system based on many reasons including:
 - b) Level of environmental activism in neighboring communities. Landowners generally chose FSC where activism was high due to the system's sponsorship and support by environmental groups.
 - c) Membership in the American Forest & Paper Association. AF&PA requires member organizations to provide, at a minimum, a self-audit demonstrating conformance to the standards of SFI. Thus, these landowners require minimal additional effort to pass a third-party audit.
 - d) Separate themselves in marketplace from neighboring competitors who are certified by the opposing system.

What Approaches to Forest Protection are Utilized by the Three Systems?

1. Certification varies from state regulations in its approach to forest protection.
 - a) FSC and SFI provide for long-term planning over an entire ownership. *Portions* of the ownership are evaluated to ensure conformance with an approved management plan.
 - b) State THPs evaluate *every* specific harvest proposal on an ownership, but do not require long-term planning other than consideration of cumulative effects. Unlike smaller properties, all ownerships over 50,000 acres must provide long-term planning documents (SYP or Option-A) over the entire property, but must still submit to the THP approval process for every harvest.
2. The standards of all three systems (FPRs, FSC, SFI) are created by entities external to those charged to evaluate and enforce the standards. Thus, each should be considered a third-party audit.
 - a) The FPRs are created by the California Board of Forestry and are assessed by other state agencies with CDF acting as the lead agency with direct involvement from the Department of Fish and Game (DGF), Regional Water Quality Control Board (RWQCB), the Department of Geological Survey, and others.
 - b) FSC generic standards are created by an international body equally represented by environmental, economic, and social interests. Specific regional standards are created by

regional working groups and must be officially endorsed by the international body. In the United States, SmartWood and Scientific Certification Systems are accredited to evaluate conformance to FSC standards.

- c) SFI standards were originally authored by AF&PA members, but an external 15-member Sustainable Forestry Board (9 must be non-AF&PA members) now authors modifications to the original standards. Multiple third-party auditing bodies are accredited to evaluate conformance to SFI standards, each of which are accredited by the American National Standards Institute.
3. Generally, FSC and SFI address specific categories of environmental parameters in their standards. The FPRs, however, rely on very specific and prescriptive requirements for individual forestry operations to achieve protection of various environmental parameters.

How does Environmental Protection Compare Between State Regulations and the Certification Systems?

1. The standards of the FPRs meet or exceed certification standards for many categories of environmental protection. However, both FSC and SFI require that all state regulations must be met and, thus, additional requirements above the FPRs must be met to attain a certificate from either organization.
2. THPs do not adequately provide the information required by either FSC or SFI because they do not provide for long-term planning, nor do they provide planning over an entire ownership. However, they do provide a greater level of environmental protection than FSC or SFI for site-specific forestry operations.

Are there Regional Variations in Assessing Standards?

1. There is some disparity in the interpretation of the FPRs by state regulators in different regions of California. In general, the Coast Forest District is the most contentious in the state and, thus, the most difficult to gain THP (Timber Harvest Plan) approval.
2. Because FSC and SFI require that all state regulations be met, and because the California standards for forestry practices are higher than other regions of the country, the standards required for certification will also be inherently higher there. However, as a result of the immense amount of planning and documentation already required by the state, California forest landowners may have to provide less initial effort at certification than in other parts of the country.

How Difficult is it to Gain Certification in California?

1. Landowners who have gained state approval for long-term planning documents such as a NTMP (Nonindustrial Timber Management Plan), SYP (Sustained Yield Plan), or Option-A

will likely have the greatest ease of gaining certification. This is because these documents demonstrate how an ownership will sustainably manage timber across the entire ownership.

2. The largest obstacles to obtaining a FSC certificate in California include:
 - a) Creating a long-term planning document that demonstrates how growth will *exceed* harvest levels over time.
 - b) Severe limitations on chemical use.
 - c) Accounting for local input into management plans, especially in areas of antagonistic environmental activism.
 - d) Monetary expense.
3. The largest obstacles to obtaining a SFI certificate in California include:
 - a) Creating a long-term planning document that demonstrates how growth will *equal* harvest levels over time.
 - b) Monetary or in-kind commitment to research in multiple disciplines.
 - c) Monetary expense.
4. Due to the expense of initial and subsequent audits, FSC and SFI certification may be cost-prohibitive, especially to small landowners with less capital. Certification options for small landowners include:
 - a) Management of the ownership by an FSC-certified manager.
 - b) Certification by organizations that SFI mutually recognizes, such as the American Tree Farm System.

Management Considerations

1. Regulatory relief should be explored for certified landowners. Current barriers include:
 - a) Difference in approach between certification plans and THPs noted above.
 - b) Mistrust by state policymakers who fear forest landowners could potentially buy FSC or SFI certificate from auditing body.
 - c) General lack of knowledge about certification by state field inspectors.
 - d) Unwillingness of auditing bodies to enter into government policymaking.
2. In order to offset the costs of certification and allow more participation, FSC and SFI, in collaboration with retailers, should work toward providing the as yet unrealized promise of a monetary premium for certified wood sold at market.
 - a) The current approach to environmental protection by the California regulatory process should be reexamined, as it is exceedingly burdensome to private landowners.
 - b) Standards are extremely prescriptive and allow little flexibility for most forestry practices.
 - c) High monetary costs result in California landowners not competing on a level playing field with other states or countries.

- d) The ever-increasing cost to landowners of complying with the FPRs leads to less active forest management, which in turn could lead to a degradation in forest health and conversion of forestlands to alternative activities such as development of subdivisions.

INTRODUCTION

Forests encompass over 30 percent of the approximately 101 million acres in California, providing a myriad of environmental and economic benefits to society. In addition to supplying critical watershed, wildlife habitat, and recreation opportunities, these forests also impart a significant economic impact to the state in the form of timber resources.

In an effort to encourage the long-term production of timber and to protect forestlands from incompatible uses, the state legislature passed the Forest Practice Act of 1945, followed by the revised Act of 1973. In 1976, the California Forest Taxation Reform Act created Timberland Production Zones (TPZ) on private forestlands, which changed taxation of timber from an ad valorem basis to a harvest tax. The 5,672,843 acres in California that are zoned as a TPZ are restricted to growing and harvesting timber, along with other compatible uses. In return for dedicating their land to forest production, the landowner receives certain property tax advantages.

These forestlands are some of the most legally protected privately owned forests in the world. Multiple layers of federal, state, county and local regulations ensure that timber will be managed in a sustainable manner. Further, these regulations promote the protection of other natural and cultural resources including water, air, soil, wildlife, recreational opportunities and archaeological sites.

In addition to strict state regulations, some forest landowners voluntarily choose to seek third-party certification of their forestlands as a means to demonstrate that they are promoting sustainable and environmentally responsible forestry practices. Certification entails a rigorous and expensive evaluation of strict standards by a qualified independent auditor (or certifier) who has no vested interest in the forestland in question. Wood or wood products from certified forests are then appropriately labeled so that retail consumers can properly identify them. There are two primary forest certification programs in the United States: the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI).

While both FSC and SFI promote exemplary forest practices, they fiercely compete to provide services to a somewhat limited market. Landowners who are interested, yet uninitiated, in forest certification are often confused by the standards and modus of operation by the two programs. Past studies, while limited in number, have provided excellent comparisons of the FSC and SFI certification systems. The Meridian Institute (2001) has provided the most in-depth evaluation of the differences and similarities between the two systems. This report, requested by The Home Depot Company, the FSC U.S. Working Group, and SFI, is the culmination of efforts by a 10-person panel of experts that included members selected by both FSC and SFI. This report readily acknowledges that it was a desk audit and not a field audit. In an effort to develop a better understanding of how certification is implemented in the field, Mater et al. (2002) of the Pinchot Institute surveyed managers of six public forests in the eastern United States, encompassing nearly 700,000 acres, who had or were seeking certification by both programs. Fletcher et al. (2001) compared the standards of the Oregon Practice Rules against those of SFI

and FSC. Their study was the first to examine the degree of similarity between state legal requirements and certification standards.

The present study investigates how the California Forest Practice Rules and other legal requirements compare to FSC and SFI standards in affording protection to environmental and cultural resources on private forestlands in California. Because the implementation of any program often varies to some degree from what is written, this study attempts to address not only the written standards, but also how they are actually applied and evaluated in the field. The specific objectives were to:

1. Determine how close California state requirements measure up to the forestry standards of the FSC and SFI forest certification programs.
2. Compare how the standards of all three systems are evaluated and enforced in the field.
3. Evaluate if there are additional requirements needed above state regulations to attain certification by FSC and SFI.

METHODS

A true comparison of how the Forest Practice Rules (FPRs) and certification standards are differentially implemented in the field would require an examination of a forest ownership that has been certified by both FSC and SFI. Unfortunately, no such property exists at present in California. It should be noted that, dependant on adequate funding, the five largest demonstration forests managed by the state as well as Cal Poly State University's Swanton Pacific Ranch and U.C.-Berkeley's Blodgett Forest are intending to undergo certification by both programs and a true evaluation can commence. In the absence of a forest with dual certification, the present study relied on several different means to obtain factual information to meet the objectives.

First, a tour and interview of a FSC-certified forestland (Mendocino Redwood Company of Ukiah) and a SFI-certified forestland (Sierra Pacific Industries of Sonora) were conducted to better understand how the regulatory and certification processes are actually enacted in the field and how much additional work had to be completed by the forest manager above that required by FPRs in order to attain certification. Representatives from The Home Depot, a major lumber retailer in the United States, were also present at the tour of the FSC-certified forest, enabling information and opinions on certification from the retail sector to be gathered. Because of budgetary and time constraints, no other properties (industrial, private non-industrial, or public) were toured.

Further, informational roundtables were held in each of the three CDF administrative districts to better understand how regulations and certification are enacted in the field. These workshops were held in August 2002 in Ukiah (Coast Forest District), Redding (Northern Forest District), and Placerville (Southern Forest District) and spanned three to four hours each. Forty-five participants, representing forest industry, CDF, private consultants, academia, small landowners,

certification auditors, loggers, and others were present at these roundtables, creating valuable dialogue about their experiences in the field meeting state and certification requirements. Workshop agendas were open. After a brief introduction and overview of the study by project staff, participants were invited to share their experiences and views on the merits or deficiencies of the two certification systems and the FPRs. Project staff recorded comments and asked follow-up questions to elaborate specific points or clarify statements.

Further, written surveys were sent to every landowner in California who was certified by either FSC or SFI (Appendix 1) as well as private consultants who managed certified lands. Surveys were also made available on a Cal Poly State University website. These surveys could be submitted by either postal mail or electronically. Due in part to a short timeline, less than 10 surveys were returned, which did not allow any meaningful statistical interpretation. However, most submitted surveys contained written comments that were incorporated with comments obtained at the workshops. The surveys that were submitted primarily represented private consultants working in either the Coast or the Northern Forest Districts.

A pre-harvest inspection (PHI) was attended by the primary investigator to see how state regulations were enforced in the field. This PHI included Registered Professional Foresters (RPF) from Alpine Forest Consulting and Sierra Pacific Industries, CDF, Department of Fish and Game (DFG), Regional Water Quality Control Board (RWQCB), and California Geological Survey (CGS; formerly Division of Mines and Geology). The PHI enabled firsthand experience at how forest regulations are enacted in California as well as provided an opportunity to discuss the experiences and observations of regulators from each of the agencies mentioned above.

Finally, a day was spent at CDF headquarters in Sacramento, where high-level administrators within the Resource Management Division were interviewed. This report is the culmination of the many interviews obtained through the previously mentioned endeavors, personal communication with experts in either FPRs or certification, and firsthand observations in the field by the authors.

Standards used in this manuscript were obtained from the 2002 California Forest Practice Rules, the FSC Pacific Coast (USA) Regional Forest Stewardship Standard (Draft 8.01, August 29, 2002), and the 2002-2004 Edition Sustainable Forestry Initiative (SFI) Program (July 1, 2002).

WHY CERTIFICATION?

Forest landowners in California seek certification for many reasons. Some sought certification because it was, in their opinion, simply “the right thing to do.” The initial lure of certification for many landowners was the promise of a premium for certified wood sold at market. However, only one forest manager interviewed stated that they had indeed realized a net economic gain through certification (FSC). Indeed, many forest managers who attained certification are now questioning whether they should remain certified given the expense of required, periodic audits. Some landowners experienced economic gain on readily visible products if sold in an environmentally sensitive market. For example, one landowner stated that he received a

premium on wood used on the inside of cabinets in the Bay Area. However, he could never demand a higher price for unseen materials such as internal studs or in less sensitive areas such as Riverside County.

Some landowners seek certification not for a premium on wood products, but instead for market share. They hope that certification will adequately provide a means of assuring consumers that their products are not only sound structurally, but also environmentally. These landowners expect markets to become more environmentally sensitive, and thus, hope to expand their market share when the demand for environmentally sound wood increases.

Some landowners seek only to maintain access to certain markets. For example, The Home Depot Company is committed to eventually selling wood exclusively from certified forests. When their goal is realized, those suppliers that are not certified would be unable to access a significant market. In some areas of the world, certification is necessary to access export markets. For example, Britain, which is both environmentally sensitive and prosperous, currently will not accept any logs into the country that are not from certified forests. In California, however, there is no incentive at present to use certification to access export markets because of the depressed economies of Pacific Rim nations, which leads to a lessened emphasis on environmental stewardship. Thus, major changes in the socioeconomic climate of the Pacific Rim nations would be necessary before certification will influence export markets for Pacific Coast lumber producers.

Other landowners, especially those whose properties are in areas with vocal and active environmental non-governmental organizations (NGOs), sought certification as a means to demonstrate to critics that they were indeed managing their forests in a sustainable and environmentally sensitive manner. They believed that a third-party audit of their forest practices would work to decrease the degree of activism against them and hopefully gain credibility in relatively skeptical communities. However, these landowners lament that their goal has not been realized and that activism against them by the NGOs has not declined. These landowners admit frustration that activists are apparently unaware of the progress made by the forestry industry in the last 10 years, particularly by those who are certified. Instead, these landowners believe that activists still continue to fight the battles of the 1990s when there was less legal protection for environmental resources. However, it should be noted that at one informational roundtable, a CDF official related that he had received multiple positive comments from community activists regarding the landowner's FSC certificate. The landowner was unaware of any positive comments and, thus, there might indeed be a secondary benefit of certification.

In the same vein, some forester managers have used certification as an active means to seek out environmental contacts, using it to engage constructive dialogue. They hope that certification can bridge gaps and develop bonds that they would previously have not been able to build. These forest managers anticipate that they can use the high standards for certification as a way of educating their neighbors, who are often vocal critics, about what constitutes good forest practices, thereby potentially alleviating future potential conflicts.

Some consultants gained certified forest manager status (FSC only) as a marketing tool to attract clients that would ordinarily be wary of foresters. While no certified forest manager that was contacted had actually gained any new clients, they believed that certification had enabled them to develop a rapport with their clients, causing clients to retain them as consultants. These managers work to provide special recognition to their clients, especially to those who are involved in environmental activism yet want to provide a source of income from their forestlands. There is some difficulty in maintaining certified forest manager status, however, due to the expense of required annual audits. Even though these managers have a strong relationship with their clients, they still do not command a greater consulting fee by being certified.

Some landowners sought third-party certification as a means to ensure that their consulting foresters were indeed doing the exceptional job that they advertised. They believed that an audit makes good business sense and have thus used an outside agent to guarantee that their land is being managed in a sustainable and efficient manner.

As mentioned previously, California's State Demonstration Forests will be seeking certification through both SFI and FSC, although funding is at present unavailable to do so. Motivations are similar to that of private landowners in that state managers hope a third-party audit of their management will help curb criticism by some environmental critics. Also like private landowners, they hope that they will be able to access broader markets. Further, they are seeking certification in order to quantify costs and benefits of each of the two systems.

Other landowners have sought certification to gain regulatory relief. Given the extraordinary amount of time and money that is necessary to comply with California's regulatory process, they hoped that a third-party audit, outside of state agencies, would relieve some of the regulatory burdens. These landowners argue that there is such a large degree of overlap on certain aspects of certification and state regulations, that it should be unnecessary to undergo the time and expense multiple times to ensure the same level of environmental protection. To a very small degree, certification has enabled some landowners to effectively argue certain management points during pre-harvest inspection. However, regulatory relief has largely not been manifested. At present, CDF field inspectors generally have little working knowledge about certification standards or process and, thus, do not give any credit in the regulatory process. Other regulatory agencies that advise CDF, who have significantly less understanding of forestry practices, have even less knowledge about certification.

Even at the higher administrative levels of CDF, which better understands certification, there is some hesitancy about the programs due to differences in process. State regulatory process generally ensures that some quantitative standard has been met. These standards have been tested in legislative and judicial forums for over 25 years. With certification, there is more subjectivity in the standards as long as the general certification criteria have been met. Without set, prescriptive standards that can be "checked off" like the FPRs, CDF is extremely hesitant to offer any regulatory relief. However, the certification process has, perhaps, led to greater cooperation between landowners and CDF. Certified landowners have generally established a trust over time with the regulatory agencies. CDF, however, is quick to acknowledge that there

are many landowners that lack certification, yet have still built a solid foundation of trust through their sound management practices over time.

Still other landowners seek certification in an effort to provide an advantage for other incentive programs such as the state's Stewardship Incentive Program. Certification does gain a few rating points on a given project, and the Stewardship Incentives Task Force is looking at certification as a specific credit in its rating system. Of note, when it was suggested at one of the roundtables that certification programs work to identify specific credits, it was emphatically stated by a FSC auditor that FSC would not enter into formal agreements with government agencies, as the two should remain mutually exclusive.

CHOICE OF CERTIFICATION PROGRAM

Most agree that FSC versus SFI certification matters little to the consumer at the local retail store. However, those familiar with certification admit a tremendous difference in attitude about the two systems among environmental NGOs, the most vocal critics of forest management. As a general rule, environmental NGOs have a deep mistrust of the SFI due to its sponsorship from the American Forestry and Paper Association (AF&PA). They believe that SFI is simply a means to cover up historic management practices by the timber industry. This mistrust is pervasive even though the standards of the SFI are set by a 15-member independent body, the Sustainable Forestry Board, which includes representatives from The Nature Conservancy, Conservation International, and The Conservation Fund.

Still, many large forest landowners choose to certify their lands with SFI. This is due in part to AF&PA requiring member organizations to, at a minimum, conduct a first-party, self-audit demonstrating conformance to the SFI standards. Many landowners who are members of AF&PA additionally seek a third-party audit for reasons discussed previously.

Because it is sponsored by groups such as the Rainforest Alliance and is supported by other environmental groups, there is a much greater trust of FSC certification among environmental NGOs. As evidence, the Redwood Forest Foundation, a non-profit environmental organization that buys abused forestlands and attempts to bring them into sustainable productivity over the long term, is using FSC as a baseline for the creation of its own Forest Management Plan.

Some companies, therefore, choose the certifying organization based on the level of environmental activism in neighboring communities. Generally, FSC certification is sought if there are vocal environmental NGOs present in a given area. As noted previously, FSC certification does not, however, ensure that activists will not continue to be outspoken critics of the certified forest landowner. For example, it was stated by one state regulator that many environmentalists lost faith with FSC after one company was certified because activists remembered only the past excessive management practices by the former landowner.

Some forest landowners choose a certification program in order to distinguish themselves from their competitors and thus potentially gain some type of market advantage. For example, one

forest manager remarked that his company sought FSC certification to separate themselves in the marketplace from their competitors, most of whom were SFI participants.

BRIEF HISTORY AND GOVERNING PHILOSOPHIES

State Regulations

For a comprehensive history of California's forest regulation, the reader is directed to Arvola (1976) and Martin (1989) who provide excellent commentary on regulation in California up to 1988. Ken Delfino, who served as Deputy Director for Resources in CDF for 13 years, is currently working on the history of forest regulation in California from 1989 to 1998. The following is but a brief overview of the history of forest regulation in California.

In 1885, California became the first state in the country to have a Board of Forestry, a then three-person committee that was created by the governor. In 1945, the original California Forest Practice Act was passed by the state legislature as a means to quell fears of an impending timber famine and to prevent any potential federal mandates on forestry practices. The original Act was much narrower in scope than the present-day Act, focusing almost exclusively on timber resources and fire prevention. The original act was nullified in 1971 when a state appeals court found that it was "pecuniary interested in the timber industry" and subsequently declared void.

The Z'berg-Nejedly Forestry Practice Act was passed in 1973. It reorganized the Board of Forestry, directing it to create the specific rules to meet the requirements of the Act. The Board consists of nine governor-appointed members, five representatives from the general public, three from the forest products industry, and one from the range-livestock industry. The five general members were mandated so as to ensure that the forest products industry would not dominate forestry policy in the state. Appointments to the Board are for four-year terms that are staggered with the terms of other members. As per Public Resources Code 740, the Board is to determine, establish, and maintain an adequate forest policy for the state.

Prior to the passage of the Z'berg-Nejedly Act, the legislature passed the Professional Forester's Law in 1971 (PRC 750-783). This law required that any person providing forestry services on non-federal lands must be licensed by the state. The law established minimum education and experience requirements as well as procedures for testing competency.

In 1975, a court decision mandated that forestry practices were subject to the California Environmental Quality Act (CEQA), which requires an Environmental Impact Report (EIR) to be filed for any activity that requires state approval and that may cause a change in the environment. After great debate, Timber Harvesting Plans (THP), which are required to be approved by CDF before timber can legally be harvested, were certified as a "functional equivalent" to an EIR as required by CEQA. In order to meet functional equivalent status, THPs are subject to review by not only CDF, but also by a multidisciplinary review panel that includes

California Department of Fish and Game, Regional Water Quality Control Boards, California Geological Survey, and others.

The guiding philosophy of the FPRs is to achieve “maximum sustained production of high-quality timber products... while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment” (PRC 4513(b)). Maximum sustained production (MSP) is demonstrated in multiple ways that will be discussed in greater detail later. The FPRs set the minimum state standards for forest practices so as to ensure MSP. The FPRs are not necessarily meant to encourage the exceptional forest management on a given site, but instead are meant to keep forester practices from resulting in significant adverse impacts where some type of environmental damage may occur. Thus, the FPRs do not necessarily encourage “good” forestry, but instead are meant to discourage “bad” forestry. One respondent referred to the FPRs as an “exercise in legal armory,” meaning that they provide effective protection from lawsuits, but do not necessarily encourage the most effective forestry practices on a given site.

The thresholds within the FPRs are sometimes contentious with both forest managers and regulators. One CDF representative lamented that even though regulators enforce the FPRs, they do not always agree that the rules are the best practices for all timber sites. Some feel that the standards set by the BOF are arbitrary and the product of political compromise rather than rigorous scientific study and testing. One Registered Professional Forester (RPF) commented that the FPRs can actually be counterproductive to exceptional forest management. He used as an example post-harvest stocking levels that are higher than some desire. He argued that while the high stocking levels may be appropriate for landowners who do not intensively manage their forests, they potentially punish management-intensive landowners who are seeking long-term benefits when they are forced to invest more into planting costs, pre-commercial thins, etc. He further argued that the FPRs may actually cause more environmental damage to the site through additional entries with heavy machinery. These arguments have been raised frequently before the BOF by timber industry representatives to no avail. The alternative would be to allow each RPF to design their own standards for each timber site. Considering the scope of operations and political climate in California, this is not a practical alternative.

Certification

The origin of both the FSC and SFI can be traced to international discussion on sustainability that arose in the late 1980s and early 1990s. Although the underlying goal of both programs is to increase high-quality forestry management, the two differ significantly in the impetus behind the formation of their respective organizations. These driving forces, as noted above, can have a profound effect on the choice of certification system that a given landowner will choose.

Forest Stewardship Council

FSC was largely organized by environmental and social NGOs. These forces led to a certification program that is officially endorsed by the World Wildlife Fund, Greenpeace, and

Friends of the Earth. Original conception began in 1990 when the NGOs met in California to discuss how they could collectively work together to improve forest practices. The Founding Assembly of FSC first met in Toronto, Canada in September 1993 and within a month decided to create a system to identify and reward exemplary forest management. By August 1994, the Founding Assembly accepted the original Principles and Criteria.

FSC is an international body currently headquartered in Oaxaca, Mexico. It adheres to a three-part mission that intends to reward landowners who support environmentally appropriate, socially beneficial, and economically viable forest management. To ensure that all three goals are met, the FSC is comprised of coequal chambers representing each concern. Because of its triune mission, FSC imparts a greater degree of concern to “people issues” than does SFI, which is primarily concerned with the effectiveness of forestry management practices at protecting the environment, thereby ensuring long-term sustainability.

Although FSC is an international body, there is a realization that one size does not fit all. Therefore, national and regional working groups are composing standards that best reflect the intent of the International Principles and Criteria for a given area. Regional standards are not officially recognized until successfully endorsed by the FSC international body. FSC-International has officially endorsed national standards for the United States, and there are nine active regions within the United States that are working toward a ratified regional standard. At present, only the Rocky Mountain and Lake State regions have developed regional standards that have been endorsed by the international body. The Pacific Coast Working Group of the FSC, which includes California, Oregon, and Washington, as well as the Northeast, Southeast, and Southwest regions, have each had their regional standards approved by the FSC-U.S. board and are seeking endorsement by the international body. SmartWood and Scientific Certification Systems (SCS), the two organizations accredited in the United States by FSC-International to conduct certification audits, extensively use the as-current draft regional standards in their interim generic standards. Upon endorsement by FSC-International, both will use the Regional Standards in place of the interim.

Sustainable Forestry Initiative

Whereas FSC owes its existence to an international body of environmental and social groups, SFI was spearheaded by the forest products industry operating in the United States. In 1990, the American Forest Council sponsored the Future of Forestry Conference, which eventually led to the adoption of the 10 Forest Management Principles. In 1994, the members of the American Forest & Paper Industry (AF&PA) embarked on an effort to improve the forest practices of all member organizations, leading to the creation of the SFI Principles and Implementation Guidelines.

These guidelines were reviewed by an 18-member External Review Panel, which included natural resources managers from academia, government agencies, and conservation groups. While forest industry was the lead in establishing the SFI, a 15-member Sustainable Forestry Board, 2/3 of which represent interests outside of industry, sets the actual SFI standards, verification procedures and program compliance.

All AF&PA members must agree to adhere to SFI standards in order to retain membership. Members must attain at least a first-party self-audit (where employees within the company verify and report conformance to the SFI standard) in order to retain membership. Because of its extensive requirements, several companies throughout the United States have left AF&PA since the inception of SFI and 17 others have been forced out because they did not adhere to SFI principles (American Forests and Paper Association 2003).

Because of its beginnings and intent, most forestlands certified by SFI are in the United States, but an increasing number of Canadian landowners are seeking SFI certification. The SFI differs from FSC in that it is concerned with meeting the individual standards of each state instead of principles that apply internationally. SFI also differs in that it places little emphasis on public comment, relying instead on regulatory agencies and other entities to address these concerns.

While there was initially a great difference in the underlying philosophical goals between the two systems, many believe that the two have moved closer in spirit in recent years. One forester close to both systems went so far as to remark that the two are like “choosing between Ford and Chevy.” A partial explanation for the convergence is that the two are competitors in a limited marketplace of forest landowners. As there are a relatively small number of forest landowners with the economic means to certify their lands, there is an admitted fierce competition between the two programs. If a certification system’s underlying philosophy is too divergent from that of a large sector of forest landowners, then that particular system will have difficulty remaining solvent and the goals of that system will obviously become unattainable.

Another potential reason for the convergence of the two systems in California is due to the enormity of the FPRs that apply to all landowners who harvest timber on non-federal lands. Because California forest landowners must provide a level of environmental protection unequalled elsewhere in the country, many of the standards for both systems are already close to being met. For either reason, it is apparent that those landowners who undergo the time and expense necessary for certification are interested in long-term benefits of their land base and are unlikely to purposely degrade their forest resources.

STANDARDS

The relative extent of requirements for each of the three systems for various categories of forestry considerations is summarized in Table 1. Each of the categories is discussed at length in sections that follow.

Table 1. Relative comparisons of the extent of requirements necessary to fulfill obligations for the California Forest Practice Rules and other state regulations, the Forest Stewardship Council (FSC), and the Sustainable Forestry Initiative (SFI)

Category	CA State Regulations	FSC	SFI
Forestry Practices			
Licensing & Training	+	=	=
Sustained Yield	= for SYP, Option-a, NTMP - for THP	+	=
Even-aged Management	+	+	=
Uneven-aged Management	+	+	=
Harvesting Practices	+	=	=
Regeneration	=	=	=
Site Prep	+	=	-
Intermediate Treatments	+	=	=
Environmental Considerations			
Soil	=	=	=
Water	=	=	=
Air	=	-	-
Fish & Wildlife	=	=	=
Forest Protection	=	=	=
Chemicals	=	+	=
Socio-economic Considerations			
Aesthetics	=	=	+
Significant Areas	=	=	=
Community Involvement	=	=	- for public input + for research

where,

“+” signifies a greater extent of requirements compared to other systems

“=” signifies an equivalent extent of requirements compared to other systems

“-” signifies a lesser extent of requirements compared to other systems

Authority and Governance

The standards of all three systems (FPRs, FSC, SFI) are created by entities external to those who are charged with evaluating and enforcing the standards. Authority for the FPRs is through the Forest Practice Act, a state statute. Rules to implement the Act are promulgated by the governor-appointed California Board of Forestry. The nine-person Board consists of five members representing the general public, three members representing the forest products industry, and one member representing the range/livestock industry. Board members serve a four-year term that is staggered with the terms of other members in order to ensure a sense of continuity on the Board.

FSC Principles and Criteria, which are the standards that are applicable internationally, are authored by a three-chambered body representing environmental, economic, and social interests. At the international level, each chamber is divided into coequal subchambers representing developed and developing countries. Thus, at best, U.S. forest managers have 1/6 voting power in FSC-International. Other countries that are involved at the international level further dilute U.S. influence. This lack of influence has been a source of frustration by some involved in FSC as they feel that, due to the large number of FSC certified forests, the United States drives FSC to a large extent, yet has little voice in the international body.

Local interests have the greatest influence in FSC standards through the creation of Regional Standards. While FSC-International authors the overriding Principles & Criteria, regional working groups author the specific indicators that demonstrate conformance to the Principles & Criteria. A three-chambered Working Group, which has representatives from over 30 stakeholders in California, Oregon, and Washington, has authored the indicators for the Pacific Coast Regional Standards. These standards have been endorsed by FSC-U.S., yet presently lack official endorsement by FSC-International. Those close to the process have expressed frustration at the apparent delay by FSC-International in officially endorsing the Pacific Coast Regional Standards.

SFI standards were originally authored by AF&PA members, but in a demonstration of continual improvement, SFI created an external Sustainable Forestry Board (SFB) that now authors any modification to the original standards. The 15-member SFB can have, at a maximum, six members of AF&PA. The entire SFB must vote on any changes in membership for the nine non-AF&PA members. Environmental groups have remained skeptical of the SFB even though it presently contains representatives from multiple conservation groups, including The Nature Conservancy. The criticism is due to industry representatives having both authored the original SFI standards and having selected the original non-AF&PA members of the SFB.

Structure

The standards for the FPRs and both certification systems are tiered in a hierarchal arrangement that consists of general themes leading to more specific evaluation criteria. The FPRs are an extensive document (currently 202 pages) setting the minimum standard for forestry practices within California's private and state forestlands. They are subdivided into seven *subchapters*

within Title 14, Division 1.5, Chapter 4 of the California Code of Regulations. Subchapters 4, 5, and 6 (Forest District Rules) comprise the majority of rules that will be discussed in this manuscript and are further divided into 14 separate *articles*, each containing the individual *rules* that govern practices on California's forestlands. Subchapters 4, 5, and 6 represent the regulations that apply to the Coast, Northern, and Southern Forest Districts, respectively. Even though they are multiple subchapters, subchapters 4, 5, and 6 appear as but one subchapter within the FPRs, usually with three numbers designated for a single rule, each number representing whether the rule is applicable in a given district. The number designation in the FPRs segregates districts by adding "20" to each rule section from the preceding district, beginning with the Coast District, then proceeding to the Northern and Southern Districts. For example, FPR 917.6, 937.6, 957.6 states that "The local representative of the Director shall be notified in advance of the time and place of any burning of logging slash." In the above example, the FPR numbers represent that the rule is applicable in the Coast (917.6), Northern (937.6), and Southern (957.6) Districts.

Confusion over the FPRs is often manifested due to their unwieldy nature as some rules are not applicable in all three of the designated Forest Districts within California, and variances often exist between districts for rules that apply to all districts. In addition, many counties have added additional rules to forestry practices within their jurisdiction. For sake of brevity and to minimize confusion, individual county rules are not discussed in this manuscript. Readers are directed to Subchapters 4, 5, & 6, Article 13 (County Rules) for specific rules within applicable counties. For brevity and for consistency to California Code, references to specific forest practices rules within this manuscript will be in the form of "14 CCR § #," which represents the rule number within Title 14 of the California Code of Regulations (CCR). Further, rules that apply to all three Forest Districts will be referenced in this manuscript by the first "#" only; if the rule varies between Forest Districts, it will be noted. Thus, the example above concerning notification of slash burning, which is applicable in all three Forest Districts, would be referenced as "14 CCR § 917.6."

FSC standards consist of 10 overriding *Principles* with 56 embedded *Criteria* that demonstrate how the 10 Principles should be adhered to. The 10 Principles are designated to encompass the concerns of the environmental, economic, and social chambers of the FSC. The 10 Principles specifically address:

- Principle 1. Compliance with laws and FSC Principles
- Principle 2. Tenure and use rights and responsibilities
- Principle 3. Indigenous peoples' rights
- Principle 4. Community relations and worker's rights
- Principle 5. Benefits from the forest
- Principle 6. Environmental impact
- Principle 7. Management plan
- Principle 8. Monitoring and assessment
- Principle 9. Maintenance of high conservation forests
- Principle 10. Plantations

The Principle and Criteria (P&C) are somewhat generic in nature to facilitate development of national and regional *indicators*. The FSC-Pacific Coast Region working group has developed draft standards endorsed by FSC-U.S. that consist of specific indicators to evaluate the adherence of landowners in California, Oregon, and Washington to the international body's P&C. Because the Pacific Coast Working Group expects official endorsement from FSC-International early in 2003 and because both SmartWood and SCS incorporate these draft standards into their evaluation of audited lands, they will be used as the official FSC standard for this manuscript. Following FSC nomenclature, specific FSC standards will be referred to in this report in the format such that "FSC 1.1.a" represents FSC's Principle-1, Criteria-1, Indicator-a.

SFI standards consist of five Principles that all participants must adhere to attain certification. Further, participants must meet 11 broad *Objectives* with 35 embedded *Performance Measures* that demonstrate how the Objectives will be met. The 11 Objectives can be summarized as:

Objective 1. Broaden sustainable forestry by employing economically, environmentally and socially sound practices.

Objective 2. Ensure long-term forest productivity.

Objective 3. Protect the water quality in streams, lakes and other waterbodies.

Objective 4. Enhance wildlife habitat and biological diversity.

Objective 5. Manage the visual impact of harvesting and other forest operations.

Objective 6. Manage lands of ecologic, geologic, cultural or historic significance.

Objective 7. Promote the efficient use of forest resources.

Objective 8. Broaden sustainable forestry with those responsible for wood procurement.

Objective 9. Publicly report progress to sustainable forestry.

Objective 10. Provide opportunities for the public to participate in sustainable forestry.

Objective 11. Promote continual improvement in the practice of sustainable forestry.

There are 75 *Core SFI Indicators* that evaluate the conformance of participants to the Performance Measures embedded in the Objectives. Further, another 158 *Other SFI Indicators* also demonstrate that the Performance Measures and Objectives are being met. Core indicators are mandatory, while Other indicators are optional and can only be evaluated with consent from the landowner. Following SFI nomenclature, references to specific SFI standards within this report will be in the format such that "SFI 1.1.1" represents SFI's Objective-1, Performance Measure-1, Core Indicator-1.

Licensing and Training

The FPRs are the only system with licensing standards for forest managers. The FPRs require that a *Registered Professional Forester* (RPF), licensed by the State, must prepare all forest management plans, from short-term Timber Harvesting Plans to long-term Sustained Yield Plans. Sections 750-783 of the California Public Resources Code (Professional Foresters Law) and Title 14, Chapter 10 of the California Code of Regulations (Registration of Professional Forester Rules) address the specific qualifications and duties required of RPFs. This law applies to all professionals in California that practice forestry on non-federal lands that are classified as "forested landscapes" (PRC 753). Because of the many environmental parameters that must be

accounted for in any state plan, RPFs must master not only standard forest subjects such as growth and regeneration, but also must have extensive working knowledge in terrestrial and aquatic wildlife habitat, soil and water dynamics, forest health, archaeology, and others. Where an RPF does not have sufficient training or experience on a given plan, (s)he is expected to seek outside consulting. Qualifications for RPF licensing include a subjective requirement of “good moral character and have a good reputation for honesty and integrity” (PRC 769). A more objective standard includes a minimum of seven years experience in forestry work, four of which can be substituted by a bachelor of science degree in forestry. RPFs must also pass an extensive written examination administered by a state-appointed committee. Typically, less than 40 percent of those taking a given exam achieve the minimum passing grade of 75 percent. The cost to take the exam is \$200, and RPFs must pay \$95 annually to keep the license current. There are currently 1,515 RPFs working for governmental agencies, consultants, forest landowners and other organizations (as of the end of 2002). Further, many federal and academic foresters are registered even though this is not a legal requirement.

The FPRs also require licensing for the timber operators who are responsible for carrying out the plans on the ground. A *Licensed Timber Operator* (LTO) is required to complete a mandatory training session approved by CDF (normally lasting two days), have 3,000 hours of work experience in two or more areas of timber operations (PRC 4572) and have a minimum of \$1,000,000 in liability insurance. A new license costs \$75 with an annual renewal of \$50 (14 CCR § 1025). License renewals may be denied to LTOs that habitually violate the FPRs.

Outside of rules stating that all applicable laws be followed, neither certification program requires specific licensing. SFI does, however, specifically state that forest managers should be trained in water quality laws and state Best Management Practices (BMPs; SFI 3.1.2). BMP training is also required of the procurement staff of SFI participants, along with training in forest regeneration (SFI 4.1.3). Further, SFI requires that appropriate personnel must have training or education in identifying and conserving rare and unique biological communities (SFI 4.3.2). SFI also requires that participants develop and administrate training courses for loggers that address issues of sustainable forestry, BMPs, regeneration, habitat protection, safety, and others (SFI 8.2.2).

FSC requires that landowners use qualified foresters, loggers, and contractors (FSC 4.1.b). Also, forest workers are expected to have received adequate training and supervision to ensure properly implemented forest management plans (FSC 7.3). Further, FSC requires that forest workers have appropriate safety training (FSC 4.2.a).

All three systems require training in proper handling of chemicals. State law requires that any person who recommends or applies restricted chemicals must hold a valid *Qualified Applicator License* with the California Department of Pesticide Enforcement. To obtain a state license, candidates must pass both a general and specialty examination. SFI requires that all persons involved in forest chemical applications have appropriate training (SFI 2.2.7) and those who supervise chemical applications be state-trained or certified (SFI 2.2.8). As per other forest workers, FSC requires that individuals who use chemicals must be adequately trained (FSC 7.3).

FSC also requires that in the event of a spill of hazardous material, only qualified personnel are to perform the appropriate removal (FSC 6.7.a).

Planning for Sustained Yield

All three systems require extensive planning in order to maximize long-term productivity and sustainability. As will be demonstrated, much of the planning elements required in a forest management plan by the certification programs can be met with state-approved plans.

A major intent of the California legislature in the creation of the 1973 Z'berg-Nejedly Forest Practice Act was to attain *maximum sustained production (MSP) of high-quality timber products* while giving consideration to other values (PRC 4513 (b)). Sustained production (yield), as defined by the FPRs, is the yield of commercial wood that an area of commercial timberland can produce continuously at a given intensity of management consistent with required environmental protection and which is professionally planned to achieve over time a balance between growth and removal (14 CCR § 895.1). Thus, sustained production requires only that harvest not exceed growth over a long-term planning period. MSP can be demonstrated through multiple means including an approved Timber Harvest Plan (THP), Sustained Yield Plan (SYP), or Non-industrial Timber Management Plan (NTMP).

THPs are created for specific harvesting units and, thus, do not adequately address sustained production over an entire ownership. THPs still adequately address state mandated MSP through prescriptive standards for even- and uneven-aged management (14 CCR § 913.11(c)). Dependant on a designated site class, even-aged stands cannot be harvested until they are 50, 60, or 80 years old (14 CCR § 913.1(a)(1)), which is intended to ensure the culmination of mean annual increment. Uneven-aged stands must retain a minimum of eight 18"+ trees per acre, four 24"+ trees per acre, or a combination thereof. In the post-harvest stand (14 CCR § 913.1(c)(1)(A)) so as to retain older age and size classes that can adequately regenerate a site. (Note: As of January 1, 2003, the FPRs were modified to require 15 ft² per acre on site class I-III lands, and 12 ft² per acre of trees 18"+ on sites IV and V.) Both standards assume that adequate protection has been afforded to the protection of soil, air, fish and wildlife, water resources and other public trust resources. This option at demonstrating MSP is allowed only by ownerships less than 50,000 acres or ownerships greater than 50,000 acres that are awaiting approval for a submitted SYP.

Within a THP, the forest manager is required to assess not only the immediate impacts of the proposed timber operation on various resources, but also the cumulative effects of the proposed timber operation and other projects that have or will occur in the closely related past, present and reasonably foreseeable probable future (14 CCR § 898). Such resources could include watershed, soil productivity, biological, recreation, visual, traffic, and others (14 CCR § 912.9, see also Board of Forestry Technical Rule Addendum No. 2, Cumulative Impacts Assessment).

Because THPs achieve state-defined MSP and also account for the cumulative effects of operations in an area, some have argued that they should suffice for the management plans required by both FSC and SFI. THPs, however, fall far short of certification requirements in that

they do not adequately address forest management across the entire ownership. Conversely, because CDF approval is required for every timber operation, THPs provide a much greater level of site-specific environmental protection than do large scope certification audits that examine only a portion of the total timber operations on an ownership.

Sustained Yield Plans (SYPs), required by the state for all ownerships greater than 50,000 acres, fulfill many of the planning elements required for FSC and SFI management plans. SYPs are long-term planning documents that encompass not only the issue of sustained yield of commercial trees, but also watershed and fish and wildlife impacts over a 100-year planning horizon. Like THPs, CDF gives final approval for a SYP with review and comments from other appropriate state regulatory agencies.

SYPs require a current inventory of timber resources by stand type and class along with projections of growth and harvest levels, usually in 10-year blocks, over a 100-year planning period. This data is considered proprietary and is thus not allowed public review without the consent of the landowner. However, to ensure accurate predictions, CDF will field-check submitted inventories and also evaluate the growth and yield models employed. In some instances, CDF has denied approval of SYPs because they did not contain accurate inventory data or did not account for constraints on harvesting in environmentally sensitive areas. To demonstrate MSP, the average annual projected harvest over any rolling 10-year period cannot exceed the long-term yield estimate for the ownership (14 CCR § 1091.4.5(a)). Thus, harvest level in any given year may exceed growth so long as the average for the planning period is not exceeded.

A complete SYP will also include a long-term assessment of impacts of timber operations on fish and wildlife. It requires a realistic inventory of current stand types and structures across the ownership so as to assess the quality and quantity of habitat types for various wildlife species. It further requires a projection of how planned harvests will change these structures through time in order to evaluate any potential adverse impacts on wildlife. A complete SYP will also include an accurate inventory of all watercourses, roads, and potentially unstable and erosive soils in a watershed so as to project the long-term cumulative impacts of timber operations on water quality and fisheries habitat. The SYP must then adequately address mitigation strategies for any adverse impacts.

An approved SYP is effective for 10 years, at which point it must be revised to include data that incorporates the most recent and accurate timber inventory on the ownership. Landowners must annually submit the amount of timber harvested on their ownerships during the past year to ensure compliance to their SYP. Landowners must also continue to submit a THP with every timber operation. However, in lieu of continually having to explain and gain regulatory approval for particular management techniques, they need only to refer to specific elements in their approved SYP.

At present, an *Option-A* is an alternative to a SYP to sufficiently demonstrate MSP on ownerships greater than 50,000 acres (14 CCR § 913.11). An *Option-A* contains the same projections of sustained yield of timber as a SYP, but does not require the detailed information

on wildlife habitats and water quality across the ownership. Most large forest landowners in California have chosen this alternative over the SYP. Indeed, only three landowners in California currently have an approved SYP. An approved SYP was initially intended to be completed for all land ownerships greater than 50,000 acres in 1995, but this deadline was pushed back multiple times, and currently is not required. These delays were partially due to landowners first desiring to prepare a state-mandated Habitat Conservation Plan (HCP), which provides long-term habitat protection for threatened or endangered species. Also, analogous to not putting all of one's eggs in one basket, some landowners, especially those with ownerships across multiple Forest Districts, are extremely wary of committing the enormous capital necessary to create an adequate SYP (one landowner has reportedly spent well in excess of \$1 million on SYP preparation). Problems with MSP in one area could jeopardize the entire SYP and delay the approval process. These landowners choose to accept the repeated expense and time necessary to undergo a more rigorous THP approval process, reasoning that multiple declined THPs are less of a financial risk than a single declined SYP.

An option for smaller landowners to demonstrate MSP is through a *Non-Industrial Timber Management Plan* (NTMP). The intent of the NTMP process is to reduce the regulatory costs of small forest landowners (<2500 acres) who wish to manage their timber resources for long-term production (PRC 4593). Like SYPs, NTMPs are long-term management plans and, thus, require much more information than do individual THPs. NTMPs call for uneven-aged management, allowing for group selection up to 2.5 acres (14 CCR § 913.2(a)). An NTMP must be completed by an RPF and requires a detailed description of the silvicultural methods to be employed, methods to avoid accelerated erosion from timber operations near watercourses, current inventory, growth and yield projections, projected harvest frequency and volumes, and much more (14 CCR § 1090.5). In order for a NTMP to achieve MSP, it must adhere to the standard FPR post-harvest stocking requirements and standard silvicultural treatments.

Review of NTMPs again requires approval by CDF with recommendations from other regulatory agencies and public input. Once approved, the plan exists in perpetuity and landowners need only to file a *Notice of Timber Operations* (NTO) to the appropriate CDF Region Office to immediately commence logging operations (14 CCR § 1090.6). NTOs describe when and where timber operations will take place, silvicultural prescriptions, types of equipment that will be used, how the landowner will adhere to new FPRs added since NTMP approval, and other pertinent information (14 CCR § 1090.7). Even though NTMPs are approved in perpetuity, landowners must adhere to changes in protection standards under other state and federal regulations such as the Clean Water Act and the Endangered Species Act. It must be noted that there is some mistrust of this option, especially by regulatory agencies other than by CDF. This mistrust is based partly on NTMPs being approved in perpetuity, allowing for limited regulatory control by those agencies in the future.

The FPRs also have provisions for a *Program Timber EIR* as a means to assess the impacts of timber operations on environmental standards (14 CCR § 1092), thereby meeting the requirements of CEQA. Landowners are required to submit a Program Timber THP before each timber operation. Because only one landowner currently implements this plan in California and because timber operations is not the primary mission, this option will not be discussed further.

SFI, like the FPRs, requires that harvest not exceed growth over a long-term planning period (SFI 1.4). To guide adequate long-term decision making, SFI participants must have adequately assessed their forest resources (SFI 4.1.2). To that end, SFI participants must demonstrate that they have a forest inventory system and an appropriate method to calculate growth and yield (SFI 1.4.3). Recommended harvest levels must be sustainable (SFI 1.4.1), and documentation must exist that demonstrates that annual harvest is consistent with the recommended levels (SFI 1.4.2). Inventory must be updated periodically and planned harvest levels must be adjusted accordingly to maintain long-term sustainability (SFI 1.4.4). Participants must also demonstrate that all forest practices across their ownership are consistent with assumptions in their harvest plans (SFI 1.4.5).

SFI, unlike the FPRs or FSC, does not necessarily require that all forest resources be addressed in a single forest management plan. Thus, the reader should not mistakenly assume that because less is written about SFI management plans, that less planning is required. Indeed, SFI requires extensive documentation of measurable policies that address how the landowner will protect and enhance various forest resources such as soils (SFI 2.4), water quality (SFI 3.2), wildlife habitat diversity (SFI 4.1), aesthetics (SFI 5.1), areas of cultural significance (SFI 6.1), and others. It is likely that each of these resources is addressed in a single planning document, especially in light of the extensive documents that are required by the state. Each of these issues will be addressed at length in later sections.

FSC planning documents differ somewhat from those required by the FPRs and SFI in that FSC not only seeks long-term sustainability of timber and other resources, but also attempts to restore these resources to historical levels across the landscape. Like the other systems, the level of harvest is based on clearly documented projections that use growth and regeneration data, site index models, and soils classification (FSC 5.6.a). However, FSC differs in that growth rates must *exceed* average harvest (FSC 5.6.b). FSC also requires that under- and overstocked stands be returned to fully stocked levels at the earliest practicable time (FSC 5.6.c).

FSC, like the FPRs and SFI, requires an inventory of plant communities, wildlife habitats, water resources, and soil resources, but also includes an inventory of the ecological processes (such as disturbance regimes) on the ownership (FSC 6.1.a), comparing current conditions to historical conditions (FSC 6.1.b). Prior to any management activity, potential impacts and their cumulative effects are evaluated (FSC 6.1.c) and options are developed to maintain the long-term ecological functions of the forest (FSC 6.1.d) so that, across the ownership, a range of native species, habitats, stand types, ages, size classes and physical structures are maintained over time (FSC 6.3.b.4).

FSC requires an extensive Management Plan (Principle 7) that must include the landowner's vision, goals and objectives, as well as short-term and long-term actions (FSC 7.1.a.1). The plan must be publicly available, but landowners may withhold proprietary information (FSC 7.4; see also 8.5). Within the management plan, the landowner must describe the timber, fish and wildlife, harvested non-timber forest products, and non-economic natural resources (FSC 7.1.b.1). The management plan must include descriptions of special management areas, rare species and their habitats, rare plant communities and other ecologically sensitive areas (FSC

7.1.b.2). A description of past land uses must also be included and incorporated into the goals and objectives (FSC 7.1.b.3). Relevant cultural and socioeconomic issues, conditions, and areas of special significance (archaeological sites) must also be identified (FSC 7.1.b.5).

The Management Plan must contain the rationale for the rate of annual harvest and species selection, which is based on growth and yield, stocking, and regeneration data (FSC 7.1.d) along with provisions for monitoring forest growth and dynamics (FSC 7.1.e; FSC Principle 8). The management plan must contain appropriate maps of forest types by age class, soils, riparian zones, archaeological sites, and habitats for rare species (FSC 7.1.h.1). A description and justification of harvesting techniques and equipment to be used are also included (FSC 7.1.i). FSC requires that the Forest Management Plan be revised every 10 years, or in response to unplanned changes in the timber resources (FSC 7.2.a).

FSC requires that monitoring be conducted (Principle 8) every 10 years to assess how well management objectives have been achieved (FSC 8.1.a). Further, an inventory system must be maintained to monitor growth and harvest levels, mortality, stocking, regeneration, stand composition and structure, effects of disturbances to the resources, abundance of non-timber forest products, water quality, terrestrial and aquatic habitats, and soil characteristics (FSC 8.2.b.1), as well as changes in the occurrence and habitat of rare species (FSC 8.2.c.1), or changes in the forest road system (FSC 8.2.d.2). Owing to the social component of FSC, generation of local jobs and public responses to management activities must also be monitored (FSC 8.2.d.3). To further ensure long-term forest management, landowners must also monitor financial indicators to ensure long-term financial ability (FSC 8.2.e.1; FSC 5.1.a.).

Silviculture

Silvicultural Systems

Landscape diversity is encouraged in all three systems. The FPRs attain diversity in a number of ways, including restrictions on stand age before harvesting is allowed (14 CCR § 913.1(a)(2)). SFI promotes landscape diversity through the harvesting of different age classes and the placement of harvests (SFI 5.4). FSC goes further, explicitly requiring landowners to maintain or restore portions of the forest to the range and distribution of tree age classes that would result from natural processes inherent to the site (FSC 6.3.a.2).

All three systems allow for both even- and uneven-aged silvicultural systems. However, FSC is the only program that requires forest managers to justify their silvicultural systems, basing decisions on ecological and economic characteristics across the landscape (FSC 7.1.c.1; FSC 6.3.a.). Because FSC promotes restoration of natural processes, all silvicultural practice must result in stand conditions similar to those produced by disturbance regimes typical for the site (FSC 6.3.a.3). FSC allows for even-aged silvicultural systems in three instances: where native species require openings for regeneration; where it restores native species composition; or if it is needed to restore landscape structural diversity (FSC 6.3.f). Also, FSC allows for plantations,

but there are specific standards for plantations that are over and above those required for natural forests (Principle 10).

The strictness of standards for even-aged management varies by program and parameter of interest. The FPRs are the only system that mandates that specific stand ages must be reached before harvest (14 CCR § 913.1(a)(2)), although FSC meets the standard in spirit, requiring that stands approach the culmination of mean annual increment before harvest (FSC 6.3.f.3). The FPRs also set the maximum size of harvest blocks lower than FSC or SFI. Whereas the FPRs limit harvests blocks to 20 acres if tractor yarded or 30 acres if cable yarded (14 CCR § 913.1(a)(2)), FSC allows for average harvest blocks up to 40 acres so long as no individual unit is larger than 60 acres in natural forests (FSC 6.3.f.4), 80 acres if in a plantation (FSC 10.2). SFI allows for average clearcut sizes up to 120 acres, more if responding to forest health emergencies (SFI 5.2.2), but requires that a verifiable policy exist to monitor clearcut size and number (SFI 5.2.1). The FPRs also require that logging units be separated by other units that are at least as large as the harvest area or 20 acres, whichever is smaller; further, there must be a minimum 300' buffer between all logging units in a given THP (14 CCR § 913.1(a)(3)).

FSC has the most stringent requirements that must be met before adjacent stands can be harvested, requiring a mean height of 7' or canopy closure in the adjacent stand before harvesting in natural forests (FSC 6.3.f.5), 10' if in plantations (FSC 10.2.c). The FPRs require that the adjacent stand average five years old or 5' tall (note that the Coast District requires a minimum of three years between harvest blocks even if the 5' condition has been met) (14 CCR § 913.1(a)(4)), while SFI requires that adjacent stands be three years old or 5' tall before a stand can be clearcut (SFI 5.3.2).

FSC places qualifiers on even-aged management, requiring retention of trees in the post-harvest stand. For any harvest, live understory trees and vegetation must be retained in the harvested area in proportions consistent with the natural disturbance regime (FSC 6.3.e). And if harvest units exceed 6 acres, then 10-30 percent of pre-harvest basal area is retained, comprising a diversity of species and size classes (FSC 6.3.e.5). In plantations, a minimum average of four dominants or codominant trees and two snags/acre must be retained. While FSC does not have rules specifically regarding different methods to employ even-aged management, it could be argued that clearcuts are discouraged and that even aged-harvests reflect more of a seedtree or shelterwood system.

The FPRs have specific rules regarding seedtree (14 CCR § 913.1(c)) and shelterwood (14 CCR § 913.1(d)) harvests. Seedtree cuts must retain eight trees/acre that are greater than 18" DBH and that represent the best phenotypes in the stand (Note: As of January 1, 2003, this rule changes to a required retention of 15 ft² of basal area per acre in 18"+ trees on site class I-III lands and 12 ft² per acre on site IV and V lands). No retained tree can be further than 150' from its nearest neighbor. If natural regeneration fails after two years, then the seed trees may be harvested and the site artificially regenerated. The seedtree removal step can only remove up to 15 trees/acre or 50' basal area. Shelterwoods have similar rules. Sixteen, 18" + DBH trees/acre must be retained after the initial cut and can only be removed after stocking requirements are

met. The shelterwood removal step can only remove up to 32 trees/acres or 100' basal area (Coast only).

The FPRs for uneven-aged management (14 CCR § 913.2) allow for openings up to 2.5 acres, but not more than 20 percent of the area within a THP can have openings. Stocking standards must be met in a timely manner dependant on the District and the site quality of the land. The FPRs also allow for transition cuts that can be employed to develop an uneven-aged stand with an irregular or even-aged structure. This method can only be used twice in a given stand and 10 years must transpire before the second cut can ensue. SFI addresses uneven-aged management only in that during overstory removal, advanced regeneration must be protected (SFI 2.1.7).

Harvesting Practices

All three systems have standards for harvesting practices. Overall, FSC has somewhat general standards, while the FPRs have extremely prescriptive standards. SFI, to a great extent, relies on state BMPs for its standard, requiring participants to have verifiable policies that demonstrate how they will adhere to the state's BMPs. For example, whereas FSC requires that logging can occur only when water quality, site productivity, and habitats are not degraded (FSC 6.5), the FPRs require adherence to an abundance of specific, quantitative measures that ensure that harvest practices will not degrade those resources (14 CCR § 914), while SFI participants must have policies that demonstrate how they will meet the FPRs.

The FPRs have standards for felling practices such as requiring that trees be felled away from watercourses and bird nesting sites (14 CCR § 914.1). The Southern District goes further, requiring that residual stump heights be less than 12", less than 8" in the High Use Subdistrict. All three systems require that the residual stand and regeneration be protected during harvest (14 CCR § 914.1(b); FSC 5.3.b, 6.5.b; SFI 2.1.7).

FSC requires that silvicultural treatments and logging equipment be appropriate for the slope and soil type (FSC 6.5.e.). The FPRs, however, are more specific, limiting heavy equipment to slopes of variable steepness dependant on District and designated Erosion Hazard Rating (14 CCR § 914.2). The FPRs even go so far as to explicitly state that tractors are not allowed on slopes so steep that blades must be used to brake (14 CCR § 914.2(b)).

Whereas FSC has a general standard that requires skid trails be designed and located to minimize the impact of harvesting (FSC 6.5.f), the FPRs have an abundance of specific standards. For example, the FPRs state that skid trails are to be limited in number and width to the minimum necessary for log removal, old skid trails should be used, and slash cannot be bunched adjacent to residual trees needed for silvicultural or wildlife purposes or placed in areas where slash will be discharged into Class I or II watercourses or lakes (14 CCR § 914.2). The FPRs also have specific rules that pertain to cable yarding (14 CCR § 914.3) and winter operations (14 CCR § 914.7).

The FPRs also have many specific requirements pertaining to skid trail watercourse crossings (14 CCR § 914.8). First, the number of crossings must be kept to a minimum. Where crossings

occur, if there is a chance that water will be present during operations, then a structure (bridge, culvert, etc.) must be constructed that allows for unrestricted passage of all life stages of fish, and which, if not permanent, must be removed prior to the winter period.

The FPRs also have specific rules regarding waterbreaks (14 CCR § 914.6). Waterbreaks must be installed no later than the beginning of the winter period of the current year of harvesting and must be installed immediately upon conclusion of skid trail, roads, and landings if no permanent and adequate drainage facilities exist. Minimum distances between waterbreaks are explicitly defined in the FPRs and depend on the erosion hazard rating and slope of the areas in question. The waterbreaks must also allow water to be discharged into some type of material (rock, vegetative cover, etc.) that will disperse surface runoff and minimize erosion.

Both the FPRs and FSC have similar rules that pertain to servicing of logging equipment and disposal of litter. FSC requires that all spills of hazardous material must be immediately contained, removed, and mitigated (FSC 6.7.a), equipment be routinely checked for leaking fluids and repaired or removed as necessary (FSC 6.7.b). Further, equipment must be parked outside of riparian areas (FSC 6.7.c) and any contaminated water from washing must be disposed of in an environmentally sound manner (FSC 6.7.d). The FPRs require that equipment not be serviced in locations where grease, oil, or fuel will pass into water bodies and that all non-biodegradable refuse from timber operations be disposed of immediately (14 CCR § 914.5).

SFI and FSC, but not the FPRs, have standards for the efficient use of materials during timber operations, thereby minimizing waste. SFI requires landowners to write a verifiable policy addressing tree utilization, and have a system to monitor utilization efficiency (SFI 7.1). Other SFI indicators include that landings be left clean, slash be distributed to add organic matter to soil, incentives exist for loggers to enhance utilization, markets are developed for underutilized species or low-grade wood, and research into wood utilization is supported. Like SFI, FSC also requires that new markets be explored and developed for underutilized wood (FSC 5.2.b) and that slash be left onsite to increase nutrient cycling and wildlife habitat (FSC 5.3.c). Further, felling, skidding, bucking, sorting, and handling must maximize volume and value (FSC 5.3.a) and provisions must be written into logging contracts that state the acceptable levels of residual damage (FSC 5.3.b).

Like skid trails, FSC addresses roads by requiring that they be designed and located to minimize the impact of harvesting (FSC 6.5.f). FSC also requires that access to roads be controlled to minimize impacts to soil and biota (FSC 6.5.h), limiting access on infrequently used roads (FSC 6.5.j) and permanently decommissioning unnecessary roads (FSC 6.5.k).

The FPRs have extensive rules that address logging roads and landings so that their construction and maintenance enhance forest resources, accommodate appropriate yarding systems and are economically feasible while simultaneously minimizing damage to soil, water, and wildlife habitat (14 CCR § 923). All roads must be identified as permanent, seasonal, or temporary, must be located to avoid unstable areas, are constructed to minimize soil movement, cannot exceed defined slope percentages, allow for turnouts, are insloped and properly drained, and stay out of designated Watercourse and Lake Protection Zones (14 CCR § 923.1). New permanent

watercourse crossings must be kept to a minimum, allow unrestricted passage of all life stages of fish, and accommodate 100-year floods (14 CCR § 923.3). There are also specific prescriptive maintenance requirements for all roads, landings, waterbreaks, water crossings, and drainage structures used in timber operations (14 CCR § 923.4).

Under the FPRs, landings have specific requirements on fill based on slope, cannot be larger than 1/2 acre unless justified, cannot be constructed during saturated conditions, and must have several mitigations completed before October 15 of the year of harvest (14 CCR § 923.5). Abandoned roads, landings, and watercourse crossings must provide permanent protection from sediment and water movement, and be such that four-wheel-drive vehicles cannot pass the point of closure (14 CCR § 923.8). Further rules exist for roads and landings in watersheds with threatened or impaired values (14 CCR § 923.9).

Regeneration

Regeneration after harvest is heavily emphasized in all three systems, with many similarities existing between them. Many of the regeneration standards required by certification can be met with the FPRs. The FPRs require that *minimum acceptable stocking* be met by advanced regeneration, direct seeding, planting, sprouting, or natural seedfall within five years of harvest (14 CCR § 912.7). “Acceptable” stocking is computed using a system that gives increasing points to larger trees. The minimum acceptable level of stocking varies by a designated site class. The FPRs further specify the types of species that must be regenerated on a harvested site. Dependant on Forest District, there are more desirable “Group-A” species and less desirable “Group-B” species (14 CCR § 895.1, Commercial Species). When calculating stocking, the percentage of Group-A species cannot diminish compared to that in the preharvest stand (14 CCR § 912.7(c)).

SFI requires that landowners reforest a harvested area within two years if regenerating artificially or five years if natural regeneration is employed (SFI 2.1). Landowners are required to have a written policy qualifying the time frame for regeneration and must designate whether an area will be naturally or artificially regenerated. Further, they must set criteria for adequate regeneration and how they correct any deficiencies, which is also generally met by using state regulations listed above. If planning to use advanced regeneration to reforest an area, measures must be taken to protect these trees during harvest. SFI also requires reporting of state-level reforestation efforts and success (SFI 2.2) and training courses to be provided to the procurement staff (SFI 8.1).

SFI allows for use of genetically improved seedlings (SFI 2.6), but requires a written policy for appropriate research, testing, evaluation and deployment. Further, all federal, state, and international protocols must be followed for research and planting of genetically improved trees. Where planted, landowners should match appropriate provinces to specific sites. SFI encourages research cooperatives for appropriate tree improvement efforts. SFI also desires ongoing regeneration surveys, the results of which should then be incorporated into modeling systems; any gains realized by genetic tree improvement should be incorporated into growth and yield calculations.

FSC requires that landowners examine many factors when deciding regeneration methods, including landscape patterns, ecological characteristics of adjacent stands, species requirements, and disturbance regimes (FSC 6.3.a). Landowners are required to select regeneration species that enhance productive capacity, genetic diversity and quality, and species diversity of the stand, and if artificial regeneration is employed, the seeds must have been attained from a known provenance (FSC 6.3.b). All seedlings must maintain or enhance the composition and diversity of the ecosystem (FSC 6.3.f). FSC also requires that native hardwoods and understory vegetation must be maintained to the natural mix of species and forest structure (FSC 6.3.e). Further conditions exist if the stand is a plantation; for example, native species must be planted if the soil is capable of supporting a natural forest (FSC 10.4).

Non-indigenous species are allowed for regeneration in all three systems, but qualifications exist. The FPRs require that a RPF clearly state in a THP how non-indigenous species meet the intentions of the Forest Practice Act, but CDF inspectors may still prohibit non-indigenous species at their discretion (14 CCR § 912.7(c)(1)). SFI states that exotic species should be minimized (SFI 1.1.5) and, if planted, the landowner must provide research that documents minimal risk from the species (SFI 1.1.6). FSC dissuades non-indigenous species so as to avoid adverse ecological impacts (FSC 6.9). However, FSC allows for their planting if it is documented that the species in question is non-invasive and does not decrease biodiversity; further, if planted, landowners are required to document the provenance and location of planting, and then monitor the ecological effects of the species (FSC 6.9.a).

Site Preparation

Adherence to certification site preparation standards, like numerous others, can be met in large part through the FPRs. SFI specifically addresses site preparation only once, and then in the context of protecting soil productivity (SFI 2.4.7). SFI, instead, assumes that measures meant to protect soil, water, and other resources will be applied at all stages of forest development. FSC only minimally addresses site preparation, requiring that it minimize impacts to forest resources; this is attained by concentrating only as much slash as is necessary to achieve the goals of site prep and reduce fuels to moderate or low levels of fire hazard, limiting scarification of soils to the minimum necessary to achieve successful regeneration, and minimally disturbing topsoil (FSC 6.5.e).

The FPRs are again more prescriptive in nature in order to maximize timber productivity, minimize fire hazards, prevent substantial adverse effects to soil, fish and wildlife habitat, and water quality (14 CCR § 915). Some rules that apply to harvesting operations also apply to site preparation, such as limiting heavy machinery operation on slopes of defined steepness (14 CCR § 914.2) and certain restrictions on watercourse crossings (14 CCR § 914.8). Further, heavy machinery cannot be used in saturated soil conditions and runoff is not allowed to flow into the site preparation area (14 CCR § 915.1). Burning of slash for site preparation must comply with rules for hazard reduction that will be discussed later (14 CCR § 917), but to reduce erosion and improve water quality, cannot fully consume the larger residual woody debris. Similar rules used in harvested areas concerning Watercourse and Lake Protection Zones (14 CCR § 916) and

wildlife habitat (14 CCR § 919) also apply to site preparation areas. In a THP, the RPF will include information on the necessity of site preparation, methods to be employed, the types of equipment to be used, how residual trees will be protected, timing of site preparation operations and other information (14 CCR § 915.4).

Intermediate Treatments

The FPRs are the only system that has specific standards for thinning operations. Minimum post-thin stocking levels must be met, which are dependent on the District and designated site class where the stand exists (14 CCR § 913.3(a)). The area to be thinned must be marked under the supervision of the RPF who submitted the THP. A sample marking area, at least 10 percent of the thinning area up to a maximum of 20 acres by stand type, must be provided for CDF inspection. Within six months after thinning, a stocking report is required to be filed.

Sanitation and salvage logging is also allowed by the FPRs with an approved THP that includes an estimate of the expected level of stocking after logging, how required stocking levels will be met, and a sample mark for inspection by CDF (14 CCR § 913.3(b)). FSC also allows for salvage logging, but prescriptions must balance ecological and economic considerations (FSC 6.3.c.4). SFI does not specifically address salvage logging.

Environmental Considerations

Soil

All three programs place high priority on soil conservation and productivity. Most of the certification standards that pertain to soil can be met through the FPRs. The Z' Berg-Nejedly Forest Practice Act directs the Board of Forestry to create rules that prevent, retard, and control accelerated erosion in order to protect soil resources, forest productivity, and water quality (PRC 4562.5). To that end, specific prescriptive mitigations to protect soil are weaved throughout the FPRs in subject areas such as harvesting methods (14 CCR § 914), site preparation (14 CCR § 915), in the building of logging roads and landings (14 CCR § 923), and others. Such mitigations could include restrictions on equipment, instillation of drainage facilities, soil stabilization treatments, abandonment of roads and landings, removal and treatment of watercourse crossings, and others. The degree of protective measures is often dependant on a designated *Erosion Hazard Rating*, which is calculated by procedures outlined in Board Technical Rule Addendum #1.

Cumulative effects on soil productivity must be addressed in both THPs and in the long-term planning documents discussed previously. Factors that must be addressed include organic matter loss, surface soil loss, soil compaction, and growing space loss from the creation of roads, skid trails, etc. (Appendix Technical Rule Addendum #2, B. Soil Productivity). Additional protective measures to soil resources are afforded in designated Watercourse and Lake Protection Zones (14 CCR § 916) and in Coastal Commission Special Treatment Areas (14 CCR § 920).

SFI requires that landowners protect and maintain forest and soil productivity (SFI 2.4). Landowners must have a verifiable, written policy to protect and maintain forest and soil productivity and must use soil maps where available. SFI participants must have a process to identify soils vulnerable to compaction and use appropriate methods to avoid excessive soil disturbance. SFI requires use of erosion control measures to minimize the loss of soil and site productivity. Post-harvest site conditions must demonstrate limited rutting, minimized skid trails, and other factors that are conducive to maintaining site productivity. Landowners must have criteria to address harvesting and site preparation to protect soil productivity. Road construction must be kept to the minimum necessary to meet management objectives efficiently. SFI also suggests that sites be mapped to match tree species to appropriate soil type, soil productivity should be monitored to determine when fertilization may be appropriate, and finally, abandoned roads and trails should be ripped and planted to return them to production.

FSC addresses soil protection in various standards pertaining to harvesting, site preparation, road and landing construction, and others. FSC does not allow logging or road construction where soil is unstable or at risk of landslide (FSC 6.5.c and d). Landings must be designed to minimize soil erosion (FSC 6.5.g), and failed drainage structures or other areas of active erosion must be identified and corrected (FSC 6.5.i).

FSC also requires that if a decline in soil fertility is observed, landowners must determine what the cause of the decline is and modify their forest practices appropriately (FSC 6.3.c.1). Examples of modified forest practices include shifting management from commercial production to restoration, minimizing site preparation, discontinuing whole-tree harvesting, and others; fertilization is discouraged, unlike SFI. FSC also requires that post-harvest activities maintain soil fertility, structures, and functions (FSC 6.3.c.3); examples include randomly distributing slash and using fire in site preparation only where appropriate to the natural disturbance regime.

Water

Like soil, the FPRs address water standards throughout the many rules that pertain to harvesting, site preparation, road and landing construction, and others. Further, there are extensive rules that specifically address timber operations in Watercourse and Lake Protection Zones (WLPZ) to ensure no adverse effects to water quality, aquatic and riparian species, or riparian ecological functions (14 CCR § 916). The FPRs divide watercourses into four classes, with Class I afforded most protection and Class IV the least (14 CCR § 916.5). Water class is dependent on the presence or potential presence of fish and other aquatic life and on the capability to transport sediment to fish bearing waters. The width of the WLPZ, which is from 50'-150', and the measure of protection afforded it depends on one of three slope classes. In general, no soil deposition from timber operations can occur in Class I and II watercourses. An extensive list of rules is therefore enacted to ensure conformity, many found in the FPR sections that pertain to harvesting and road construction.

Specific rules are intended to protect water temperature, water flow, filtration, upslope stability, bank and channel stability, spawning and rearing habitat for salmonids, and vegetation structure diversity for fish and wildlife habitat (14 CCR § 916.4). Within the WLPZ, at least 75 percent

surface cover must be retained to dissipate raindrop energy and to provide for wildlife habitat (14 CCR § 916.4(b)(6)). While Class III and IV watercourses have the least protection, additional limitations, such as heavy equipment restrictions, may be placed on them if there is potential for sediment transport to downstream Class I and II watercourses.

The FPRs also require that in a WLPZ adjacent to Class I and II waters, if areas of mineral soil greater than 800 ft² are exposed by timber operations, then mitigations to reduce soil loss by mulching, seeding, chemical stabilizers, or other treatments must ensue (14 CCR § 916.7). In addition, the FPRs require many more stringent rules in watersheds with threatened or impaired values (14 CCR § 916.9) or where timber operations may degrade a domestic water supply (14 CCR § 916.10).

The FPRs also allow for the public nomination of *Sensitive Watershed* status to areas where further timber operations could cause significant adverse cumulative effects to forest resources (14 CCR § 916.8). If a land is so designated after a multifaceted nomination process, then mitigation measures must be employed there to protect the specific resources outlined in the nomination process.

Further, the FPRs provide additional protection measures to watercourses in “Threatened and Impaired” watersheds that contain state or federally listed salmonid species. This includes a mandatory 150' WLPZ on all fish streams regardless of slope class, no harvest within the channel zone, and additional restrictions when harvesting in inner gorges (14 CCR § 916.9).

FSC, like the FPRs, designates four categories of watercourses based on the watercourse’s ability to support aquatic populations. FSC requires that water bodies and riparian areas be managed to maintain hydrologic processes, water quality, and habitat characteristics including the capacity for water infiltration, habitat for riparian species, moderation of water temperature, sedimentation control, and others (FSC 6.5.1). Landowners must retain and recruit vegetation and woody debris to provide shade, erosion control, and in-channel structures (FSC 6.5.m).

Again like the FPRs, FSC requires that Category-A streams have a buffer strip with special management considerations (FSC 6.5.n). These areas will be at least 50' from the active high water mark and may be larger dependant on the forest type, slope stability, steepness, and terrain. Management within the buffer must restore native vegetation, limit harvesting to single-tree selection, retain canopy cover, exclude heavy equipment, and avoid soil disturbance and road construction. Further, an additional “outer” buffer zone, at least 150' from the active high water mark, is required where only single-tree or group selection is allowed, habitat is provided for the full complement of aquatic and terrestrial species native to the site, new road construction is avoided, and soil disturbance is minimized (FSC 6.5.n). Protection is afforded to other stream categories with decreasing stringency (FSC 6.5.o-r).

FSC further requires that grazing be controlled to control degradation to riparian vegetation and stream banks (FSC 6.5.s). Stream crossings must be located and constructed to minimize fragmentation of aquatic habitat, maintain water quality, and accommodate a 100-year flood (FSC 6.5.t).

SFI dedicates the whole of Objective-3 to the protection of water quality in streams, lakes and other water bodies. SFI requires that landowners implement and document riparian protection measures based on soil type, terrain, vegetation and other applicable factors (SFI 3.2). Conformance is measured by many core indicators, including a written policy addressing management and protection of riparian zones, the mapping of water bodies, verification of management in the field, identifying and protecting non-forested wetlands, implementing a system to achieve compliance to applicable regulatory requirements, and documenting compliance to legal requirements. Other SFI indicators include installing sediment filters such as straw to minimize sediment transport to water bodies, installing temporary stream crossings and skidder bridges, upgrading substandard culverts, and seeding of exposed soil to limit soil transport.

SFI also requires research into water quality through current financial or in-kind support for research (SFI 3.3). Other indicators include allocating expertise to water quality research, direct involvement in cooperative research related to sustainable forestry, actively working with scientists from academia, government, or the private sector, sponsorship of student scholarships, participation in professional research societies, participation in state or national association research committees, and participation in water quality research through industry research programs. SFI also requires BMP training for forest management employees (SFI 3.4).

Air

Both FSC and SFI pay little heed to the effects of timber operations on air quality. FSC does not mention air quality at all, except for the qualification that all applicable laws (Clean Air Act) are adhered to (FSC 1.1). SFI states that one of the elements of sustainable forestry is the conservation of air quality (Principle 1), yet has no indicators to demonstrate conformance to the standard.

While not specifically addressed in the FPRs, air quality issues in forestry operations are addressed in the California Code of Regulations Title 17 (Public Health), Division 3 (Air Resources), Chapter 1 (Air Resources Board), Subchapter 2 (Smoke Management Guidelines for Agricultural and Prescribed Burning). All prescribed burns or other forest activities that will generate smoke must have an approved burn permit (17 CCR § 80120). The state Air Resources Board designates individual days as a permissive burn day where all approved burn plans may be implemented, a no-burn day where approved burn plans cannot commence, or a marginal burn day where the local air district, in an effort to mitigate the cumulative effects of multiple burns, decides which approved burn plans can be implemented (17 CCR § 80110). The decision for level of burning activity is based on meteorological criteria that vary in each of the 15 air districts in the state (17 CCR § 80179). Each individual air district adopts, implements and enforces their own smoke management program consistent with state guidelines (17 CCR § 80140). Special requirements for burning exist in wildland-urban interface areas (17 CCR § 80160). Some areas have additional rules regarding prescribed burning; for example, the Southern Subdistrict of the Coast District expressly forbids broadcast burning (14 CCR § 917.4(d)).

Fish and Wildlife

All three programs work to provide protection for fish and wildlife species. There are many similarities between the three in maintaining and recruiting certain elements of habitat that are beneficial to a wide array of species. While FSC and SFI tend to focus more on encouraging species diversity, the FPRs lean more to eliminating adverse effects to fish and wildlife and their habitat. However, most of the certification requirements can be met by meeting the standards of the FPRs.

Many of the specific rules that protect fish and wildlife are located in sections of the FPRs that pertain to harvesting practices (14 CCR § 914), site preparation (14 CCR § 915), watercourse and lake protection (14 CCR § 916), and road construction (14 CCR § 923). Additionally, all planning documents required by the state demand an appraisal of how the cumulative effects of timber operations will affect aquatic and terrestrial habitat. Some of the aquatic elements that must be considered are pools and riffles, large woody material, and near-water vegetation; terrestrial elements to be considered include snags/den trees, downed woody debris, multistoried canopies, road density, hardwood cover, late seral forest characteristics and continuity (Appendix Technical Rule Addendum #2).

The FPRs require other provisions to be met, in addition to those discussed previously in other sections, that protect wildlife and their habitat. First, forest managers must retain all snags within harvest areas with some exceptions, including within 100' of roads or homes, if needed to control for disease and insects, and others (14 CCR § 919.1). Buffer zones must be established around all trees containing active nests for some avian species; the size of the buffer zone and the operations that are allowable within the zones are dependant on the species in question and the specific time of the year (14 CCR § 919.3). In addition, considerable other protections are afforded to the habitat of listed species such as northern spotted owl (14 CCR § 919.9) and the marbled murrelet (14 CCR § 919.11) as well as to BOF-designated “sensitive species” such as the northern goshawk. Wildlife surveys are mandatory to determine “presence” or “absence” of listed species if suitable habitat is present. Plan proponents must also obtain “no take” certifications from the appropriate wildlife agency for the northern spotted owl and marbled murrelet.

The FPRs also allow the public to petition the BOF for designation of *sensitive species* status if a population requires timberland as habitat, is in decline, or may be threatened from timber operations (14 CCR § 919.12). If harvesting is allowed in areas that house sensitive species, then nest trees, designated perch trees, screening trees, and replacement trees must be retained to protect their habitat (14 CCR § 919.2). The FPRs also have provisions that protect wildlife habitat in late succession forests (14 CCR § 919.16).

SFI requires that participants promote biological diversity at both the stand- and landscape levels (SFI 4.1). Landowners must produce written policies that promote wildlife habitat diversity, forest types and conservation of biological diversity. Landowners must provide training for appropriate personnel in identification and protection of federally listed threatened and endangered species, and have programs to protect imperiled species and communities. They

must also have plans to retain wildlife habitat elements such as snags, mast trees, downed woody debris, etc. Other indicators include land classification maps on habitat types, harvest strategies that diversify indigenous flora and fauna, funding for direct protection of biologically rich areas, and others. SFI participants must also provide financial or in-kind support for research on wildlife management, ecosystem function, or conservation of biological diversity (SFI 4.2).

SFI participants must contribute to the conservation of biological diversity (SFI 4.3), which is demonstrated through an inventory of imperiled species and communities, training for appropriate personnel in identifying and conserving rare and unique biological communities, and incorporation of research results on biodiversity into forest management decisions. Other indicators include participation in cooperative ecological landscape planning and staff allocated to wildlife research.

FSC requires that forest landowners identify and describe both common and rare species and their habitats (FSC 6.1.a, 7.1.b.1). If a rare species is likely, then the land must be surveyed to confirm the presence of the species or managed as though the species was present (FSC 6.2.a), working to improve or restore its habitat (FSC 6.2.b).

Habitat components necessary to support native species are protected, maintained, or enhanced across the ownership; examples include structural complexity, understory species diversity, food sources, nesting and roosting structures, and others (FSC 6.3.b.3). FSC further requires that streams and riparian areas be managed to maintain habitat characteristics (FSC 6.5.l). To that end, FSC requires that landowners retain or recruit legacy trees, old and large trees, snags and woody debris to sustain populations of native plants and animals across the ownership (FSC 6.3.e.1).

FSC requires that timber operations can occur only when there will be no degradation of habitat (FSC 6.5.a). Conservation zones must also be created to enhance the viability of populations and their habitats (FSC 6.2.c), with measures taken to control inappropriate hunting, fishing, and trapping (FSC 6.2).

Forest Protection

Like many of the standards discussed previously, FSC and SFI provide general standards on the protection of forests from fire, insects, and disease, while the FPRs provide more rigid, prescriptive standards. Again, most certification standards can be met through the FPRs. However, those landowners who use chemicals to control pests would perhaps find FSC's standards most difficult to meet.

Because of its frequency and potential for damage in California, the FPRs emphasize fire to a greater extent than insects and disease. With exceptions in the Southern Subdistrict of the Coast District and Coastal Commission Special Treatment Areas, slash within 100' of the edge of a public road must be treated by lopping, piling and burning, chipping, burning or removal from the zone (14 CCR § 917.2), with treatment to be completed no later than April 1 following harvest. Slash from 1"-8" within 100' of a permanently inhabited house must be removed or

piled and burned; this zone extends to 200' where fuels must be treated by methods described above. Subject to county and subdistrict rules, broadcast burning of slash may be allowed with specific rules pertaining to WLPZs, permitted dates of burning, and minimum width of fire breaks (14 CCR § 917.3). All Districts require notification before burning (14 CCR § 917.6) and protection for residual trees (14 CCR § 917.7).

In regard to insects and diseases, the FPRs require that in areas where the Board of Forestry has declared a zone of infestation or infection pursuant to PRC Sections 4712-4718, RPFs must identify feasible measures to mitigate adverse infestation and infection impacts from timber operations (14 CCR § 917.9). Board of Forestry Technical Rule Addendum No. 3 addresses potential adverse effects of the Ips beetle and other insect species that breed in logging slash by proposing multiple treatment alternatives.

SFI landowners are required to protect forests from damaging fire, pests, and disease (SFI 2.5). Core indicators include a written policy to protect forests from damaging agents, management to create healthy and productive conditions that minimize susceptibility of damaging agents, and participation in fire and pest prevention and control programs. Other indicators include reduction of fuel hazards in fire prone areas and adjacent to structures, initial fire attack capability, prescribed burning where appropriate to reduce fuel levels, mapping and monitoring of insect and disease outbreaks, and use of integrated pest management strategies where feasible. SFI landowners are also required to have current financial or in-kind support of research to address forest health and productivity (SFI 1.2).

FSC requires that forest managers identify and apply site-specific fuels management practices based on natural fire regimes, risk of wildfire, potential economic losses, and public safety (FSC 6.3.c.2). Pest management is to be implemented through silvicultural systems, integrated pest management, and strategies that minimize adverse environmental impacts while reducing or eliminating chemical use (FSC 6.6.a); such practices can include the creation and maintenance of habitat that discourages pest outbreaks, diversification of species composition and structure, and the use of prescribed fire. Landowners must develop written strategies to control pests as a component of their management plan (FSC 6.6.e). Exotic, non-invasive predators can be used to manage pests, but only for the control of non-indigenous pests and only after other pest control measures are deemed ineffective (FSC 6.8.a).

Chemicals

The FPRs address chemicals in forest operations only on a limited basis, but there are extensive regulations on chemical use in California that are enforced by the State Department of Food and Agriculture. The list of restricted chemicals, as well as the constraints on their use including permits, permissible amounts, application methods, licensing of applicators, and others is detailed in the California Code of Regulations Title 3 (Food And Agriculture), Division 6 (Pesticides and Pest Control Operations), Chapter 2 (Pesticides), Subchapter 4 (Restricted Materials).

The most common way that chemical use is specifically addressed in the FPRs is through the additional rules of various counties that require THPs to include a statement that indicates the proposed type, quantity, purpose and method of application of any chemicals listed as restricted by DFA (e.g., 14 CCR § 925.4.e). The FPRs also advise RPFs to be aware of the cumulative effects of chemicals on watersheds in the form of pesticide treatments, equipment fuels and oils, the introduction of nutrients released during slash burning, and others (Appendix Technical Rule Addendum #2 A.2.d).

SFI participants are allowed to use chemicals to achieve management, but must minimize their use and protect employees, neighbors, the public and the forest environment during their application (SFI 2.3). Core indicators include a written policy for appropriate application and handling of forest chemicals, minimization of chemicals while achieving management objectives, use of least toxic pesticides necessary, use of integrated pest management, appropriate training for all persons involved in forest chemical applications, supervision of forest chemical applications by state-trained or certified applicators, accessible copies in appropriate places of state and federal regulations regarding chemical use, participation in research projects, and application of chemicals using Best Management Practices. Other indicators include availability of licensed pesticide applicators or nutrient management specialists, GPS technology to map application sites and patterns, and contractors who are properly trained and adequately insured.

FSC is adamantly opposed to most types of chemical applications. The goal of forest landowners should be to reduce or eliminate chemical use; however, they can be used when research has shown that less environmentally hazardous practices are ineffective (FSC 6.6.a). The most environmentally safe chemicals must be used and effects on non-target species must be minimized (FSC 6.6.b). They can be used only when and where they pose no threat to domestic water supplies, aquatic habitats, or habitats of rare species (FSC 6.6.c). When used, records are kept of worker exposure and environmental impacts (FSC 6.6.d). A written prescription must be prepared that fully describes the risks and benefits of their use and the precautions that workers will employ (FSC 6.6.f). As per natural forests, control of pests in plantations should implement prevention and biological control measures in place of chemical pesticides and fertilizers (FSC 10.7).

Other standards exist for the management of chemical contamination from machinery used in forest operations (FSC 6.7).

Fertilization is not mentioned in the FPRs. SFI requires that chemicals, including fertilizers be used prudently, following BMPs, and meet or exceed applicable laws and regulations (SFI 2.3). FSC states that forests should be self-sustaining over time and that longer rotations and diversity of species should be used in lieu of fertilization (FSC 6.3.c.1). Systematic use of fertilizers would be an indicator of a plantation (FSC Principle 10).

Socioeconomic Considerations

Aesthetics

Aesthetics are addressed by all three systems, but SFI by far has the highest standards. Per the Z' Berg-Nejedly Forest Practice Act, aesthetics is one of many elements that must be considered when attempting to maximize MSP (PRC 4513(b)). To that end, the FPRs require that the cumulative effects of timber operations on visual resources be considered when planning timber operations (14 CCR § 912.9(3)). Also, the FPRs require clearcuts to be irregular shaped and variable in size to mimic natural patterns (14 CCR § 913.1(b)). And when conversion of TPZ lands is proposed, the effects on aesthetics by alternative uses must be considered (14 CCR § 1109.2(b)).

SFI dedicated the entirety of Objective-5 to minimizing the impact of harvesting on aesthetics (Objective 5). Some of the SFI indicators include verifiable, written policies that address the management of visual quality, incorporation of aesthetics in all aspects of harvesting operations, training of foresters in principles of landscape architecture, and the use of terrain models and computer visualization tools to manage the impacts of timber operations on aesthetics.

FSC says little in regard to aesthetics other than to apprise local stakeholders of potential effects of timber operations on aesthetics (among others) so as to address any concerns in management plans (FSC 4.4.b) and to consider the economic benefits of aesthetics (among others) as a means to generate income (FSC 8.2.e.2). In plantations, aesthetic factors are incorporated into the layout and design (FSC 10.3).

Significant Areas

The FPRs provides many provisions for the protection of archaeological and historical resources (14 CCR § 929). In the preparation of a THP, the landowner is required to conduct an archaeological records check with the appropriate Information Center of the California Archaeological Inventory to determine if known archaeological sites exist within the THP area. Landowners are also required to provide written notification to the appropriate representative on a Native American Contact list (provided by the Native American Heritage Commission) as to the location of the THP and request information on the existence of any historic or cultural resources within the THP area. Also, a professional archaeologist or a person appropriately trained (as per 14 CCR § 929.4) must complete a field survey of the THP area to explore for potential historical sites. The results of these three items must then be submitted as a *Confidential Archaeological Addendum for a THP*.

If an archaeological site exists within the THP area, then appropriate mitigation efforts must be made to ensure protection of the historical or cultural resource (14 CCR § 929.2). The landowner must submit in the Confidential Archaeological Addendum how the site will be protected from damage during timber operations. Further, the landowner must meet with the LTO prior to timber operations to show the site and discuss the protection measures that will be required during harvests. If a potentially significant historical or cultural site is found after a

THP is approved, then operations must cease until CDF agrees to any protective measures for the newly discovered site.

Public Resources Code Section 5024.1 defines what constitutes unique or significant sites under California law. Generally, sites that indicate the prehistoric presence of indigenous peoples are almost always treated as significant and therefore protected (PRC 21083.2). However, sites that indicate potential historic significance of non-indigenous peoples are more difficult to define and depend on who, what or where an historic event occurred. State-owned properties require special consideration of (potential) historic resources that are more than 50 years old.

SFI requires that participants manage lands of ecologic, geologic, cultural or historic significance in a manner that recognizes their special qualities (SFI 6.1). Landowners must have a written policy to identify, map and manage special sites. Further, they must obtain existing natural heritage data and cooperate with those with expertise in identifying or selecting sites for protection of significant ecologic, geologic, cultural or historic qualities. These sites must then be mapped and cataloged.

FSC also requires that landowners request Native Americans to assist in identifying sites of current or traditional significance, work to protect these areas, and maintain confidentiality of disclosure for these sites (FSC 3.3.a). Other archaeological sites or sites of cultural, historical, or community significance must also be identified and protected during harvest operations (FSC 4.4.c).

FSC requires that management activities in *High Conservation Value (HCV) Forests* maintain or enhance the attributes that define such forests (FSC Principle 9). Such forests could include concentrations of biodiversity values, rare ecosystems, cultural or religious significance, and others. Landowners must assess their ownership to determine if there are HCV attributes (FSC 9.1.a; attributes found in Appendix D) and consultations must be held with stakeholders and scientists to confirm that proposed HCV locations and attributes have been accurately identified (FSC 9.2.a). Management plans must include specific measures that ensure maintenance of the applicable conservation attributes (FSC 9.3). HCV forests must be managed over the long term to assure that their qualities are maintained (FSC 9.3.c) with conservation efforts coordinated between landowners of other HCV forests in the area (FSC 9.3.d). Further, annual monitoring to assess the effectiveness of the measures must be employed to maintain their attributes (FSC 9.4).

The FPRs also requires additional regulations for any timber operations within a Coastal Commission Special Treatment Area that was designated by the California Coastal Commission of July 5, 1977 (14 CCR § 921). While timber operations are not precluded in these areas, extensive additional regulations exist, including severe restrictions on clearcutting.

FSC places a high degree of significance on old growth forests (FSC 6.3.d.). FSC categorizes old growth into three separate classes based on the size and the structural characteristics of the stand in question. Type 1 stands (those with over 20 contiguous, unlogged acres) may not be harvested unless they are tribal lands (FSC 6.3.d.1). Further, stands adjacent to Type 1 stands must be managed to minimize abrupt edges (FSC 6.3.d.2). Net acreage in Type 2 and 3 stands cannot decline as the result of forest management activities (FSC 6.3.d.2). And if

underrepresented on the landscape, a portion of the ownership is managed to create old-growth characteristics (FSC 6.3.d.4).

Community Involvement

All three systems call for measures of community involvement, but in different manners. The FPRs allow for extensive public involvement in not only the creation of standards, but also their evaluation. First, the nine-member Board of Forestry that is charged with authoring the FPRs is required to have five members from the general populace who represent interests outside of the timber industry. Public notification and input is incorporated into the approval process for most planning documents submitted for CDF, including THPs (14 CCR § 1037.3), NTMPs (14 CCR § 1090.17), SYPs (14 CCR § 1091.10), and burning of logging slash (14 CCR § 917.6). Further, the public may petition the Board of Forestry to designate both wildlife species (14 CCR § 919.12) and watersheds (14 CCR § 916.8(a)) as *sensitive*, thereby affording them greater protection.

FSC also requires community involvement and transparency to local stakeholders in their management plans. Like the FPRs, FSC calls for public input into determining whether a certificate should be awarded. And when planning for timber operations, the public must be allowed to offer input, which is then addressed in the plans and in the operations (FSC 4.4.). Many other social indicators must be met, but are generally met through national and state labor laws.

SFI does not require solicitation of public input in management planning, nor do they require stakeholder input when awarding certificates. They do, however, exceed both the FPRs and FSC in their requirement for financial or in-kind support for research. SFI participants must support many phases of forest research including forest health and productivity (SFI 1.2.1), increased efficiency and reduced use of chemicals (SFI 2.3.10), water quality (SFI 3.3), wildlife management, ecosystem functions, and conservation of biological diversity (SFI 4.2).

PROCESS

Evaluation of conformance to the FPRs and to standards of both certification systems should all be considered a third-party audit. In all cases, one body is given the responsibility of creating the standards, while another body, external to the creative body, is tasked with determining the conformance of a landowner to the given standards. With state regulations, there is no choice in the audit team as it is mandated by law that the lead auditor will be CDF with other agencies acting in an advisory role. Those seeking certification, however, have the choice of audit teams. This does not imply that landowners seeking certification will choose those auditors that they feel will most easily grant certification. On the contrary, landowners insist that they want an audit team that can credibly defend their forest practices. Some of the reasons cited for choosing a particular audit body included professionalism and credibility of the audit company, estimated

cost of the audits, and a general comfort level between the landowner and the potential audit teams, which is perceived will lead to a good working relationship.

Forest Practice Rules

In the case of the FPRs, the standards to be met are created by the state Board of Forestry (BOF). As noted earlier, the BOF is composed of nine governor-appointed members, five from the general public, three from the forest products industry, and one from the range/livestock industry. The auditing of the FPRs is through other state agencies with CDF acting as the lead agency with direct involvement from the Department of Fish and Game (DFG), Regional Water Quality Control Board (RWQCB), and California Geological Survey. Other agencies, such as the Coastal Commission, the County, and State Parks may also be part of an official review team as appropriate.

While there are long-term planning documents (SYP, Option-A, NTMP) that are evaluated for conformance to the FPRs, regulatory agencies most often evaluate a landowner's conformance to the FPRs based on the submission of a THP. Registered Professional Foresters (RPFs) are responsible for the preparation of THPs, which describe how the landowner will harvest timber while eliminating any significant adverse effects to the environment. Because of the extensive nature of the FPRs, THPs can exceed 500 pages in some instances. CDF annually receives over 1,000 THPs, which can only be submitted to four locations in the state, including Santa Rosa, Fresno, Redding, and Riverside. Within 10 calendar days of receiving a THP, CDF assigns the document a processing number and a *first review* is held among CDF, RWQCB, DFG and other interested parties to determine if the THP is complete and will conform to the FPRs. Questions usually arise during the review that must be addressed by the RPF who prepared the document. After first review deems that a THP is complete, *notice of intent* is sent to landowners within 300' of the THP as well as the county clerk and the local CDF Ranger Unit. Letters are also sent to Native American contacts and all landowners 1,000' downstream of the proposed plan. Further, a notice of submission is sent to any individual who has requested that they be notified when a THP is submitted.

A Pre-Harvest Inspection (PHI) of the logging site is usually required before a THP is accepted. CDF is responsible for scheduling a PHI with the RPF and other review agencies within 10 calendar days after the THP is accepted for filing. Both CDF and forest landowners confirm that the 10-day schedule is often extended because of scheduling conflicts of the review team agencies, who must review and process a large number of filings. PHIs generally last one to two days, but can be longer in more complex situations. During the PHI, the RPF, CDF, and other concerned agencies meet in the field to address concerns by the regulators. Any outside interested parties must attain permission from the landowner to attend the PHI. At the PHI, the RPF explains the mitigation measures that will be taken to address concerns of the regulators.

Generally, a solution to regulator concerns is negotiated in the field during the PHI. Sometimes, the RPF will disagree about the extent of mitigation measures that regulators require and an impasse is reached. Legally, CDF cannot deny a THP that is in compliance with the FPRs.

However, there is often concern by the RPF about delays in the process and also about future political ramifications with the regulators and, thus, the impasse is often concluded by the RPF submitting to measures beyond the legal requirements of the FPRs in their THP.

Following the PHI, representatives from the regulatory agencies write a PHI report that includes their observations and suggestions. A copy of these reports and suggestions are sent to the RPF for review. Within 20 days of the PHI, there is a *second review* of the THP by the state review team. There, regulators examine the THP, PHI reports, responses of the RPF to first review concerns, and public comment to date. The RPF may choose to attend the second review to immediately respond to any mitigation measures that are to be included in the THP. The proposed changes to the THP can also be typed and sent to the RPF. At that point, the RPF can agree to mitigations and simply sign a statement of agreement. The RPF can also opt to disagree with added mitigation measures and propose other mitigations. This, of course, only adds to the delay of THP acceptance.

Public comment on the THP is accepted from the date of initial filing to at least 30 days, 10 days of which must be after the second review. This public review time frame was extended by legislation in 2001 to allow additional public input after modifications to the THP were finalized following the second review. After the public comment period has closed, CDF responds, in writing (called the “Official Response”), to all written public comments. Both comments and CDF response are included in the THP file.

Within 15 days of the close of the public comment period, the CDF Director either approves or denies the THP. Because CDF is the lead agency in the THP process, they may approve a plan that other agencies disagree with. In this instance, the disagreeing agency representative may opt to file a “*non concurrence*,” meaning that they disagree on the conformity to the FPRs in the THP. If a THP is denied by CDF, the RPF has the right to appeal the decision to the BOF. Rarely is a THP denied on how components within the plan will adhere to the standards of the FPRs. Instead, the vast majority of THPs are denied based on process.

Once a THP is approved, landowners have three years to harvest the timber in the THP. Up to two one-year extensions may be requested, thereby increasing the life of a given THP to five years. Before timber operations commence, the submitter of the approved THP must notify CDF of the landowner’s intent to carry out logging on the property. CDF inspects active logging operations to ensure compliance with the approved THP. Violations to terms of the approved THP are subject to notices of violation that require corrective measures, civil penalties that include fines and revocation of the RPF license, and also criminal penalties.

Some exemptions exist to the THP process that require no full review by the regulatory agencies, only a notice of intent to be filed to the appropriate CDF Ranger Unit (14 CCR § 1038). Each exemption must meet certain provisions and adhere to rules given for each exemption. For example, Christmas trees may be harvested without an approved THP (14 CCR § 1038(a)). Salvage logging of dead and dying trees is permitted without a THP so long as rules on volume cut and equipment are met (14 CCR § 1038(b)). Also, harvesting for purposes of fuel reduction is allowed so long as mandated rules are met. There are also emergency provisions in the FPRs

(14 CCR § 1052) that allow for the cutting of trees without an approved THP. Generally this is after some type of disturbance that leaves dead and dying trees, but there are also provisions for removing of trees for construction or repair of roads and also financial emergencies (14 CCR § 1052.1). There is also an exemption for the conversion of less than 3 acres of timberland to a non-timber growing use (14 CCR § 1104.1(a)). This type of exemption does not require a THP, but does require the preparation of a minor conversion document by a RPF.

All of these exemptions are exempt only from the requirement of a THP, not from adherence to the FPRs. These exemptions are “ministerial” (automatically approved without discretion) and are presumed to have a minimal adverse effect on the environment. There is some mistrust to these exemptions by agencies outside of CDF because of the lack of review. Indeed, some landowners have been accused of exploiting these provisions to avoid the time and expense of the THP review process.

Long-term planning documents (SYP, Option-A, NTMP) go through similar review processes as the THP, with only variance in timing and costs of preparation and submission. Again, these plans should be considered a third-party audit as the governor-appointed BOF composes the rules while CDF, with advisement from multiple other state agencies, ensures adherence to the rules.

Other alternatives to the THP process exist as well. For example, the *Modified THP* can be submitted on ownerships of less than 100 acres who are not intending to implement a clearcut or shelterwood removal (14 CCR § 1051). Also, a landowner who has an approved *Program Timber EIR* (PTEIR) may submit a *Program THP* (14 CCR § 1092). These alternatives, however, are used sparingly.

Forest Stewardship Council

There are two certification bodies operating in the United States that are accredited to issue FSC certificates, SmartWood and Scientific Certification Systems (SCS). SmartWood is administered by the Rainforest Alliance, a nonprofit environmental organization based in New York City. SCS is a for-profit company based in San Francisco. The choice of audit team by some FSC-certified landowners was based on the type of landowners that neighbored their property and also which geographical region the landowner was marketing to. Some landowners in communities of particularly vocal environmental activists chose SmartWood to audit their forest practices because it was perceived that SmartWood’s affiliation with the Rainforest Alliance would bring a sense of credibility to the local populace.

Although differences exist in how actual assessments are scored, SmartWood and SCS incorporate a similar process in their assessment of a forest landowner’s conformance to FSC standards. After being approached by a potential client, an initial meeting is usually coordinated where the client is instructed by the certifying organization as to the objectives of FSC certification as well as its potential benefits, general financial costs, process, limitations, and other pertinent information. Landowners often hold initial meetings with both SmartWood and SCS to ascertain which company they will pursue FSC certification with. In one case,

Mendocino Redwood Company sought FSC certification through both certifying bodies so as to provide the greatest objective evaluation of their ownership.

If the landowner wishes to pursue FSC certification after the initial meeting, a second multi-day pre-audit meeting is scheduled with the selected audit company to provide a preliminary evaluation of the ownership. This preliminary evaluation can involve the examination of applicable forest management documents and plans, interviews with both landowner employees and outside stakeholders, as well as observations made in the field. From this preliminary evaluation, the landowner is informed of the probability of obtaining a certificate, the time frame necessary for an adequate assessment of the ownership, and the potential costs of obtaining the certificate.

The certifying body and the client then negotiate a contract to undergo a full evaluation of the ownership. The contract is based on estimated costs necessary for an audit team to adequately assess conformance to FSC standards and to prepare a peer-reviewed final report of the audit team's results.

The certifying body then assembles an audit team, which consists of a team leader and other appropriate assessors. Team members can work directly for the certifying agent or can be subcontracted. Team leaders are ultimately responsible for the evaluation process. SmartWood requires that team leaders must have attended a formal SmartWood assessor training course or have participated as a team member in another SmartWood land evaluation. Team members are selected based on expertise in relevant disciplinary fields as well as regional familiarity and credibility. Team members are given responsibility of leading the assessment in their appropriate area of expertise, but are allowed input into any area of assessment. Generally, the landowner has input into the makeup of the audit team, but final decision of team members is up to the certifying bodies. SCS allows for third-party arbitration if a resolution cannot be reached with the landowner about team membership.

Team members are then assigned responsibility to collect data that are pertinent to adequately assess conformance to FSC standards. The necessary data are obtained in multiple ways, including landowner-submitted documents, interviews with community stakeholders, field measurements and observations by audit team members, documents obtained by regulatory agencies, and others. Because of economic realities, team members do not survey all of a given ownership. Instead, team members select areas that are representative of the landowner's holdings. Usually, a systematic sampling strategy is employed that will allow auditors to examine the multiple ecotypes within the given ownership.

Both SmartWood and SCS solicit public comment from pertinent stakeholders in the community, including landowners neighboring the audited ownership, environmental groups, governmental agencies, and others. Public comment is obtained in a variety of methods including personal interviews, public forums, requests for written comments, and others.

Often, team members investigate particular concerns brought up in these comments so as to ascertain the validity of any accusations against the landowner.

Although SmartWood and SCS incorporate the same FSC standards into their assessment, the actual method of scoring conformance to FSC Principle and Criteria varies significantly between the two. SmartWood follows a form exactly like the FSC Principles and Criteria and scores each indicator for a given criteria as either non-applicable or on a scale of 1-5 based on the following table.

Score	PERFORMANCE General Description	COMPLIANCE Pre-conditions, Conditions and Recommendations
N/A	Not an applicable criteria	Not applicable, thus no pre-conditions, conditions or recommendations; criteria not used for score averaging
1	Extremely weak performance; strongly unfavorable or data lacking	Pre-conditions required
2	Weak performance; significant improvement is still needed	Pre-conditions optional; conditions required
3	Satisfactory performance	Conditions optional
4	Favorable performance	Recommendations; no conditions
5	Clearly outstanding performance	Recommendations possible, but not typical

Where *Pre-conditions* exist, landowners must adequately address the criteria before an FSC certificate will be awarded. A certificate can be awarded with *Conditions* that must be met before a given deadline. If these conditions are not adequately addressed in the time frame designated by SmartWood, the certificate can be revoked. SmartWood may also offer *Recommendations* to improve the forest management of the landowner, but it is not necessary that they be implemented.

SCS scores conformance to the FSC Principles and Criteria in quite a different manner. The SCS system is based on three primary *Program Elements*, each including six *Evaluation Criteria*. These include:

Element A: Timber Resource Sustainability	A1: Harvest Regulation
	A2: Growth and Stocking Control
	A3: Pest and Pathogen Management
	A4: Forest Access
	A5: Harvest Efficiency and Product Utilization
	A6: Management Planning and Information Base
Element B: Forest Ecosystem Maintenance	B1: Forest Community Structure and Composition
	B2: Long-term Ecological Productivity and Health
	B3: Wildlife Management Actions, Strategies and Programs
	B4: Watercourse Management Policies and Programs
	B5: Pesticide Use, Practices, and Policies
	B6: Ecosystem Reserves
Element C: Financial and Socio-Economic Considerations	C1: Financial Stability
	C2: Community and Public Involvement
	C3: Public Use Management
	C4: Investment: Capital and Personnel
	C5: Employee and Contractor Relations
	C6: Legal and Regulatory Compliance

For each of the evaluation criteria, there are guidelines that auditors employ to assign scores from 1-100. The FSC-Pacific Coast Region draft guidelines are incorporated into the scoring system of each evaluation criterion for lands in California. Also, the evaluation criteria are relatively weighted so as to best reflect the case-specific context of the ownership under

consideration. Thus, each of the six evaluation criteria within a program element will receive differential importance dependant on the ownership being evaluated. Landowners must attain a minimum weighted-average score of 80 in all three program elements before a certificate is awarded. Like SmartWood, SCS will provide Pre-conditions, Conditions, and also voluntary Recommendations based on the scores of their assessment. While not following verbatim the 10 FSC Principles and Criteria, the SCS protocol is endorsed by the FSC-International.

Both SmartWood and SCS normally award certificates for five years. However, they both usually insist on subsequent annual audits as a condition for certification. The annual audits will usually cover different geographic areas in the ownership so as to best appraise the conditions of the entire ownership. Many of the same stakeholders are contacted again on subsequent audits to ensure that the landowner continues to be a good neighbor.

Individual *Resource Managers* can also be certified by FSC through either SmartWood or SCS. These certificates are generally sought by consulting foresters who manage small holdings of many landowners. Audits are similar to those of large, singularly held ownerships. Generally, audit teams will evaluate several ownerships that are managed by the Resource Manager seeking certification. After a certificate is awarded, subsequent audits are performed on other ownerships not initially included in previous audits.

Sustainable Forestry Initiative

The SFI certification process is based on international auditing procedures and follows protocol of the American National Standards Institute's (ANSI) U.S. standards (ANSI-ISO 14010-96, ANSI-ISO 14011-96, ANSI-ISO 14012-96). There are multiple third-party auditing bodies that are accredited to issue an SFI certificate. Some of the firms that have conducted third-party SFI audits in California include Pricewaterhouse Coopers, Arthur Anderson, and KPMG. For each audit team, there is a designated *lead verifier* who is required to be certified by the Registrar Accreditation Board in one of four possible grades of environmental auditor under the ISO-14001 Environmental Management System standard so as to ensure that they have obtained appropriate training in accepted verification principles, procedures and practices.

Within SFI, landowners must decide on the holdings that they will seek certification for. Generally, all lands within a geographic region will be audited during a given audit. Thus, a landowner will likely seek certification for all holdings within California. Usually, landowners have previously conducted first- or second-party audits previously and have some sense of the effort needed to become third-party certified. Landowners are required to file a notice of intent to seek certification with the Sustainable Forestry Board before any claims may be made about the landowner's attempt to become certified. Landowners then solicit bids for SFI auditing to firms that have no direct interest in the ownership. Interested firms present the landowner with their qualifications and audit procedures and then contracts are negotiated between the landowner and the selected auditing firm. The lead verifier conducts a *Gap Analysis* to assess whether the landowner has the necessary material needed to conduct an audit and to clarify the geographic scope and scale of the certification.

A certification team is then assembled with input from both lead verifier and the landowner. There are many qualifications of audit team members to ensure that these other *verifiers* have the education, training, and experience to conduct an adequate and fair audit. SFI requires that, at a minimum, each team will have expertise in wildlife ecology, silviculture, forest hydrology, and operations. Further, each team must include at least one professional forester as defined by the Society of American Foresters or licensed by the state in which the audit took place.

During an audit, all core indicators will be investigated. Further, additional indicators may be examined with the agreement of the landowner. Upon selection of the core indicators (mandatory) and other indicators (with landowner consent), the lead verifier, in consultation with the landowner, creates an audit plan that identifies the verification criteria and indicators that will be examined, the audit team and their official responsibilities, how conformance to the SFI Principles and Objectives will be assessed, and a timetable in which a completed audit report will be generated.

Generally, a meeting is conducted with the audit team and the landowner to familiarize the participating parties. This is also used to ensure that the landowner is aware of the methods that will be employed in the audit and the types of data that will be collected. The audit teams decide on a representative sample of the land holdings to be certified and then proceed to assess the conformance of the landowner to the SFI Principles and Objectives. While SFI does not require input from the local community as does FSC, it does encourage interviews with regulators and others to ensure that the landowner is in compliance with the FPRs.

After necessary data are collected, another meeting is convened to discuss audit results between audit team members, the landowner, and other appropriate stakeholders. This meeting allows opportunity for the landowner to potentially counter any negative results found in the audit. However, ultimate decisions on audit results lie with the lead verifier. Subsequent to the meeting, a final report is written by the audit team and submitted to the landowner, which includes how and when the audit was performed and the ultimate conclusions of the audit. If all indicators are found to be in conformance, then an SFI certificate is awarded at this time. If the landowner desires to publicly proclaim their SFI certification and use SFI labeling, then a summary of positive results must be made publicly available. This summary does not have to include any specific findings from the audit.

COSTS

The cost of all three protection systems can be extremely burdensome to landowners, particularly those with small ownerships and less capital. Indeed, the preparation and submission of a single THP can cost well in excess of \$10,000. All landowners must pay for surveys for wildlife, rare plants, and archaeological sites; for notification to the public, downstream landowners, and Native Americans contacts; for the RPF to generate, represent, and modify the plan; for the cost of submitting the plan; for extra measures required by regulators; and for others. The costs for long-term planning documents are even more taxing. For example, NTMPs, intended to give some relief to non-industrial forest landowners, can cost in excess of \$15,000 for preparation.

And one larger landowner has reportedly expended more than \$1 million in the preparation of their SYP.

Certification confers additional costs to the landowner, both in added time for preparatory work and in the actual audit. Prices are set by the auditing firms and vary dependant on the audit company, the size of the ownership, the complexity of the ownership, the amount of pre-work completed before the actual audit, the level of public input (FSC only), and others. When solicited for the cost for certification, costs for initial FSC audits varied from 10¢ to 47¢ per acre, but were substantially reduced in subsequent audits. The annual cost to FSC-certified Resource Managers ranged from \$1,000 to \$1,500. Little response was given from those with SFI certification, but one large landowner stated that they had spent in excess of \$250,000 to date for their certificate.

There have been complaints by smaller landowners that there is little accounting for scale of operations in the certification process. These landowners cannot afford to hire the staff necessary to adequately prepare and complete the work necessary for certification without running an immense deficit. Thus, they fear that they may be unfairly kept from realizing the potential benefits that certification promises. A FSC auditor forwarded one solution to the dilemma, suggesting that smaller landowners pool their resources in order to hire a FSC-certified Resource Manager.

It should be noted that there are other indirect costs associated with both the FPRs and with certification. As a result of the many protective measures within the standards of each, landowners may be forced to scale back harvest intensity below that desired, thereby leaving capital in the forest in the form of uncut trees. Certain watercourses can be upgraded in classification for wildlife purposes, again leaving more trees on the site. And because FSC requires that growing stock increase on the site, rotations will be forced to be lengthened, thereby putting those stands at greater risk to fire, insects, and disease.

ENFORCEMENT

All three systems have enforcement measures for compliance to their respective standards. CDF is allowed to inspect timber operations without notification at any time during or after a timber operation to ensure compliance to the FPRs (PRC 4604). Further, DFG, WQCB, or the State Water Resources Control Board can inspect a timber operation after 24-hour notification and if accompanied by a representative of CDF. If the CDF inspector witnesses activities that are in violation of FPRs and that may cause significant adverse impacts to soil, water, wildlife, or timber resources, then (s)he has authority to issue a stop order that is effective immediately and throughout the next day (PRC 4602.5). This stop-order may be extended five additional days, excluding Saturday and Sunday, by a supervising forest officer if upon inspection, (s)he finds that the original stop-order was warranted. Accused violators can appeal penalties to the superior court in the county where the violation allegedly occurred (PRC Section 4601.3). Further, a timber operator can present a claim to the State Board of Control, which can reward the operator from \$100 to \$1,000 per day the stop-order was in effect. CDF may require

corrective actions to commence within 30 days to resolve the violation. If the violator refuses, CDF will provide the necessary mitigation and then charge the landowner, usually at a rate well above that on the open market. A lien for said services can then be placed on the land in question for a period of up to 10 years (PRC 4608).

As certification is voluntary, only the FPRs provide for criminal and civil penalties. Any person who willfully violates provisions of the FPRs is guilty of a misdemeanor and may be punished by a fine of not more than \$1,000 for each violation and/or imprisonment up to six months in county jail. In practice, a sentence of imprisonment was rarely levied due to the courts rightly placing more emphasis on violent crimes. Also, because the monetary penalty was much lower than costs associated with the preparation of a THP, some violators considered the penalty to be nothing more than the “cost of doing business.” Thus, there was little enforcement available.

However, SB 621 became effective in January 2000, enacting much stiffer penalties for conscious violators of the FPRs. Civil penalties now include a fine of up to \$10,000 for each violation. The first civil penalty for violating provisions within the FPRs was settled against a Crescent City man, who was fined \$12,000 for illegally harvesting logs without a THP and without a timber operator’s license.

Because certification is voluntary, there are no civil or criminal penalties associated with either FSC or SFI. However, both programs may require corrective measures to be completed or risk revocation of their certificate. Both SFI and FSC will award a certificate for minor violations as long as the landowner provides an action plan with a timeline to adequately address the nonconformance. Revocation of a certificate can stigmatize a landowner, which then works toward financial damage in the marketplace. In the case of SFI, it can also lead to expulsion from AF&PA.

DISPARITY IN ASSESSMENT

California forests are some of the most legally protected private forestlands in the world. No state in the country can claim the number or degree of standards that must be met in California. The extent of regulation does not necessarily equate to the best forest management in the country, but it does ensure that the minimum level of forestry is much higher in California than anywhere else in the nation.

The discussion that follows is important to this study because it indicates how the FPRs differ from the certification systems as they relate to the political process enacted in California. California’s 56-year history of the regulatory experience has evolved into operational modes that define how regulators and forest landowners interact. These relationships are important since the basic requirements of the certification systems require compliance with all state legal requirements.

Even though the standards for the minimum level of forestry are already high, they are regularly exceeded in practice. This is due in part to variable interpretation of the standards by state

regulators. Some CDF inspectors have openly stated that they believe the standards of the FPRs, higher than anywhere else in the country, to be a “C-” job, and that they fully expect forest managers to do better. Other non-CDF regulators, many of whom have little formal knowledge of forestry, have even stronger feelings. This expectation is sometimes manifested in the field by regulators who, during a pre-harvest inspection, insist that RPFs adjust THPs above the minimum standard before their agency will support plan approval.

This trend, in turn, has led RPFs to regularly “lowball” their planned forest practices within a THP even though they fully intend more extensive forest protection in the field. The pre-harvest inspection has been likened to horse trading where the buyer (RPF) starts bidding low (meeting the minimum state standard) knowing that the seller (state regulators) will counter whatever is first offered with a higher price (greater protection). Interestingly, many industrial and smaller forest landowners have internal forest management policies that exceed the standards of the FPRs. However, they are reluctant to explicitly describe those policies for fear of setting precedent and subsequently being forced to always meet those higher standards. Additionally, any provisions described in a THP are enforceable by CDF, even if those provisions exceed the FPRs.

Forest managers and regulators from multiple agencies readily agree that there is a disparity in the interpretation and implementation of state standards in the different forest Districts in the state. To the person, every individual interviewed for this report, including representatives from forest industry, CDF, DFG, RWQCB, and others, agreed that the Coast District is the most contentious in the state and, thus, the most difficult to gain THP approval. This apparently stems in part from less than amiable relationships between the various regulatory agencies there, particularly between CDF and DFG or RWQCB. Elsewhere, CDF and the other advisory agencies often have a strong working relationship and can, thus, negotiate and agree on a given protection measure in the field during a pre-harvest inspection. The discord between agencies on the Coast District, however, does not lend itself to field negotiations and an impasse is often reached between CDF and the other agencies that results in non-concurrences being filed.

While CDF is the lead regulatory agency and has final approval on protective measures required¹, other agencies may file a “non-concurrence” on the approval of the THP. Some have accused CDF inspectors of requiring landowners to meet DFG or RWQCB demands, which are far in excess of state regulations, in order to minimize incidences of non-concurrences, which are frowned upon by agency administrators. The landowner must then make a decision on whether to spend the time and money needed to appeal a potentially denied THP or to grudgingly agree to conform to the desires of the regulators. Most often, the choice is conformance.

Multiple forest managers, independent of one another, described a similar scenario in the Coast District. During a PHI, regulators from DFG or RWQCB demand a certain protective measure

¹ PRC 4582.9 allows “Head of Agency” appeal of an approved THP under specific requirements. This provision is never used according to CDF (2002), allows the director of DFG and/or the WQCB to request the BOF to overrule the director of CDF on the approval of a THP.

be implemented. The forest landowner then refuses on the basis that it is too expensive, far above what is required by law, and will not result in the intended outcome. CDF agrees with the RPF and attempts to negotiate another option, which the initial regulator refuses. The landowner still refuses to agree to a required measure, at which point the initial regulator declares that he will file a non-concurrence if the THP is approved. CDF then explains to the RPF that (s)he does not want any non-concurrences and that (s)he will find some reason to deny the THP. Realizing the expense, time, and effort to appeal the denial to the Board of Forestry, the RPF grudgingly accepts the regulator's demands.

It should be noted that CDF inspectors, in addition to sometimes-difficult relationships with other state regulatory agencies, are often caught in the middle of a political crossfire between environmental activists who feel they are a pawn for industry and the same industry which feels they far too often overstep their authority. This unenviable position has led to frustration in some inspectors, who simply want to do their jobs well, yet are consistently barraged with criticisms on all sides.

There were multiple reasons given for the discord between the regulatory agencies on the Coast District. Some believe it is simply a matter of conflict between strong personalities. Others attribute it to the intense degree of environmental activism in the region, which has been driven for over 100 years by concerns for old growth coast redwood forests. This school of thought contends that as activists become more vocal in their criticisms of an agency, the regulators feel compelled to require more of the landowners, even if it is much greater than is required by the FPRs.

One obvious element to the conflict is the difference in training and experiences of employees from the various agencies. CDF generally hires RPFs whose education was obtained at traditional forestry institutions with an historic emphasis in timber management. Many CDF foresters have previous experience in the timber industry or federal agencies such as the U.S. Forest Service. DFG biologists, however, are usually trained in the field of wildlife biology or zoology. And RWQCB review team members come from a variety of backgrounds, usually involving some specific environmental protection emphasis, geology, or engineering. Thus, most regulators from DFG and RWQCB have little hands-on experience in forest management and the timber industry that they are charged with regulating.

There is also disparity in rules interpretation and implementation among varying landowners. CDF admits that landowners who regularly display good forestry practices are not scrutinized as hard in the field due to a trust that has developed through time. Other landowners, who in the past have shown less compliance to the FPRs, are required to do more and are more closely inspected during and after timber operations. CDF also admits that those landowners who have attained third-party certification through FSC or SFI have usually developed that long-term trust. CDF also says, however, that there are landowners without certification who have also developed that same level of trust.

Regional disparity also exists within certification. Even though there are national standards for both FSC and SFI, it is abundantly clear that the on-the-ground rigor for certification differs

geographically, particularly between states with varying degrees of regulation. It is unambiguously stated in both certification standards that all state regulations must be met (FSC 1.1; SFI Principle 5). Thus, California, with an extensive array of layered state regulations, will inherently have more difficult standards than will other regions of the United States where there are little to no regulations concerning forest practices. FSC, as noted earlier, has regional standards that are intended to address pertinent forest management issues for a given region. Even though FSC-International must endorse all regional standards, they will inherently differ from one another, which could potentially lead to greater difficulty in attaining standards between regions.

Also, the high level of public involvement in California lends itself to greater difficulty in meeting certification standards, especially by FSC. Public input is part of the FSC social component of certification. Where public input is great, especially if antagonistic, landowners are held to a higher standard by FSC in order to adequately address concerns by those interested outside parties. One forest manager commented that he had once protested actions required by FSC auditors as they were far above the actions required on other FSC-certified forests, but was told that he must submit to the more rigorous requirements as he was in a “different social context.” It is especially difficult during the initial audit in areas of vocal environmental activism because auditors must explore all outside public concerns and accusations. Subsequent annual audits are somewhat easier to pass as auditors have had time to become familiarized with community stakeholders who continually make unsubstantiated claims or believe the company is not a good steward regardless of on-the-ground evidence to the contrary. Greater public input also leads to greater scrutiny by state regulators and thus more difficulty in gaining approval for the state plans, a requirement of both certification systems.

MANAGEMENT IMPLICATIONS

Because the California standards for forestry practices are higher than other regions of the country, the standards required for FSC or SFI certification there will also be inherently higher. However, as a result of the immense amount of planning and documentation already required by the state, California forest landowners may have to provide less initial effort at certification than in other parts of the country. For example, foresters in North Carolina who are seeking certification from both FSC and SFI recently reported that although they believed that they were doing an excellent job of managing their forests, they had difficulty in providing the documentation necessary to prove it to the audit teams (Jervis et al. 2002).

THPs, while extensive and accounting for cumulative effects, do not adequately provide the information that is needed by either FSC or SFI. This is because THPs do not provide for long-term planning, nor do they provide planning over an entire ownership. However, they do provide an excellent reference in which to begin the long-term planning necessary for certification.

Those landowners who have gained state approval for a NTMP, SYP, or Option-A will likely have the greatest ease of gaining certification. Unlike THPs, these documents do not focus on a

single point in time or space. Instead they force the landowner to demonstrate how they will achieve maximum sustainable production of their timber resource in the long term and over their entire ownership, while simultaneously accounting for environmental parameters such as soil productivity, water quality, and wildlife habitat.

While state-approved plans adequately provide much of the information needed by certifiers, there are other activities that could potentially hinder a landowner's ability to gain certification. For many landowners, one of the largest obstacles in obtaining FSC certification will be the elimination of chemicals in their forest management. While FSC states that chemicals are discouraged but not prohibited, at least one landowner stated that he was required to plan on how chemical use would eventually be eliminated in his forest management activities. Also, due to the large social component of FSC, some have found difficulty meeting the requirement of accounting for local input into management plans, especially in areas of antagonistic environmental activism. One of the larger hurdles for many landowners in gaining SFI certification will be committing resources to research in the areas outlined previously.

Another stumbling block to certification will be the expense involved in attaining and keeping a certificate. This is especially true for smaller landowners who do not have the capital needed for the initial audit, nor for the subsequent annual audits. These smaller landowners may be unfairly kept from attaining the potential benefits of certification for this reason alone. Some options for these landowners may be to pool their resources with other like-minded landowners and seek an FSC-certified Resource Manager to manage their lands. However, this option may not be realistic since many of these certified managers have recently decided that the personal annual expense of retaining their certificate is not worth the payoff. Small landowners may have some hope in that SFI now mutually recognizes the American Tree Farm System, a certification program designed for smaller landowners, and is examining mutual recognition with other groups.

Regulatory relief has been another way that has been suggested to reduce costs and thus allow more landowners to participate in certification. There is some sound reasoning in this in that many of the standards for certification equal or exceed state standards. However, similar to the problems in converting THPs to certification, certifiers examine only portions of an entire ownership, while THPs scrutinize a single timber operation on a single part of the ownership. Even so, this does not suggest that state policymakers should not further explore this option. Another way to potentially provide relief is for administrators in the regulatory agencies to somehow resolve the contention between the agencies discussed earlier. The lack of cooperation in some areas has worked to the detriment of the forest landowner, who is left with an overwhelming sense of frustration with the system.

Indeed, many forest managers are somewhat perplexed as to why their profession is so heavily scrutinized compared to other land management activities that cause far more deleterious long-term effects to the environment. For example, forest managers question why there is no public cry to arms over the burgeoning number of vineyards being planted onto California's hillsides, which provide little public benefit and cause more significant and permanent adverse impacts to soil, water, and wildlife than timber operations ever could.

Finally, another way to offset the costs of certification and allow more participation is for the certification systems, in collaboration with retailers, to work toward providing that as yet unrealized initial promise of a premium for certified wood sold in the market. Forest certification originally envisioned many worthy goals. However, if there continues to be little to no financial incentive for forest landowners to undergo the arduous and expensive certification process, then these same goals may go unrealized.

CONCLUDING REMARKS

The legal standards for forest management on private lands in California are higher than in most parts of the world. As discussed, state regulations provide protection to many of the state's environmental and cultural resources similar to that demanded by FSC and SFI. Further, the RPFs charged with managing timber resources in California have more rigorous licensing requirements than any other state. And California requires an accounting of how forests will be managed sustainably by its largest landowners.

Unfortunately, the approach to environmental protection in California is extremely burdensome to private landowners, which in turn may result in many unforeseen, long-term negative effects. Part of the burden to California landowners is attributable to prescriptive standards that allow little flexibility for most forestry practices. Consequently, a professional forester crafting a THP might be forced by regulatory standards to include practices that might not equate to the best practice for that particular situation. Classical forest management is based on adapting a variety of options to each on-the-ground problem. However, the state regulatory process forces a one-size-fits-all approach that cannot accommodate all the variables of California's landscapes. While many rules have exceptions or optional practices that can be used if explained and justified, this process causes additional labor for the RPF preparing the plan and more scrutiny by the state regulators reviewing the plan.

Current state regulations also force an immense monetary burden on California landowners. Because of the high cost of the regulatory process, California landowners are not on a level playing field with competition from other states or countries. Some landowners, particularly small, non-industrial ownerships, find it difficult to not only remain competitive with other regions, but also find it taxing to simply remain solvent. This, in turn, has led to a reduction over time in the amount of forestlands that are actively managed. While some factions who aim to eliminate all harvesting in the state may cheer this trend, it should instead be of great concern to the majority of California's populace.

While state regulations are intended to protect California's forestlands, an unintended consequence of overbearing regulatory expenses will be an eventual degradation of forest health in many of California's forestlands. The absence of active forest management caused by overbearing regulatory expenses, coupled with a continued absence of fire on the landscape, will and has led to overstocked, unhealthy stands in many forest types in California. These unhealthy stands then facilitate insect and disease epidemics while also contributing to a higher risk of catastrophic wildfire.

Further, the ever increasing cost to forest landowners for complying with the FPRs could drive some to utilize their land for purposes other than the growing and harvesting of timber. Conversion of lands to alternative activities such as subdivisions cause permanent environmental changes that are far more drastic than forestry activities.

California has a seemingly insatiable appetite for forest products, yet impedes supplying its needs from its own forestlands due to the enormous expense of the regulatory process, which limits supply. At present, California is a net importer of wood from other regions and countries that have much lower standards of environmental protection. For those who truly think globally, it would seem much more environmentally responsible to utilize renewable resources that are harvested in some of the most legally protected private forests in the world rather than exploit other countries that have less rigid standards.

So given the immense cost of state regulation, should California landowners voluntarily incur another cost in third-party certification? This, of course, is a decision left to the individual landowner. Both FSC and SFI certification systems have noble goals, many of which are obtained by simply adhering to state regulations. And at present, there are few economic incentives to gain certification. This may change in the future, however, and landowners must make conscious decisions based on their individual business strategies. Given the degree of environmental protection afforded to California forests, all forest landowners, whether certified or not, should consider seeking some type of environmental recognition and labeling by retailers.

Finally, one point appears clear, the current approach and particularly the expense of state regulations are hindering forest management in California. Californians should be proud of the environmental protection that occurs on its forestlands; however, changes in current policy must occur lest the system become counterproductive to the same forests it seeks to protect.

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LITERATURE CITED

- American Forest & Paper Association. 2003. Sustainable Forestry Initiative Condition for Membership. URL address accessed on February 2, 2003:
http://www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/What_is_the_SFI_Program_/What_is_the_SFI_Program_.htm
- Fletcher, Rick, Paul Adams, and Steve Radosevich. 2001. Comparison of two forest certification systems and Oregon legal requirements. Report to the Oregon Department of Forestry, December 14, 2001.
- Forest Stewardship Council Pacific Coast Working Group. 2002. Pacific Coast (USA) Regional Forest Stewardship Standard Draft 8.01, August 29, 2002.
- Jervis, Larry, Judson Edeburn, Warren Boyette, Susan Moore, Frederick Cabbage, Daniel Richter, and William Gardner. 2001. Forest certification on state and university lands in North Carolina. In: Proceedings, Conference on Global Initiatives and Public Policies: First International Conference on Private Forestry in the 21st Century. March 25-27, 2001. Atlanta, Georgia.
- Mater, Catherine, Will Price, and V. Alaric Sample. 2002. Certification assessments on public and university lands: a field-based comparative evaluation of the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) programs. Technical Report to the Pinchot Institute for Conservation. June 2002.
- Meridian Institute. 2001. Comparative analysis of the Forest Stewardship Council and Sustainable Forestry Initiative Certification Programs.
- Sustainable Forestry Initiative. 2002. 2002-2004 Edition Sustainable Forestry Initiative (SFI Program), July 1, 2002.

APPENDIX

Survey Sent to All Landowners in California Certified by FSC or SFI

1. What district in California describes the primary location of the land you manage?
 - a) Coast Forest District
 - b) Northern Forest District
 - c) Southern Forest District
2. In what year did you last harvest timber under a Timber Harvesting Plan?
3. Under which system is your land certified or will be certified? (Circle all that apply)
 - a) Forest Stewardship Council (FSC) by Scientific Certification Systems (SCS)
 - b) Forest Stewardship Council (FSC) by SmartWood
 - d) Sustainable Forestry Initiative (SFI)

Rating the Difficulty of Meeting Standards

For each of the three forest protection systems below, please rate from 1 to 5 how difficult it was to meet the standards for the given area of ecological concern:

- 1- No standard to meet
- 2- Little difficulty
- 3- Somewhat difficult
- 4- Difficult
- 5- Extremely difficult

		Forest Protection System																	
#	Area of concern	CA Forest Practice Rules (FPR)					Forest Stewardship Council (FSC)					Sustainable Forestry Initiative (SFI)							
1	Sustainability	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
2	Regeneration	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
3	Stocking levels	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
4	Water resources	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
5	Soil resources	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
6	Air quality	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
7	Chemical use	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
8	Rare, threatened, & endangered species	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
9	Wildlife habitat	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
10	Exotic species	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
11	Genetic diversity	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
12	Structural diversity	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
13	Landscape-level management	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
14	Reserve or special areas	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
15	Fire protection	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
16	Insect/disease protection	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
17	Visual resources	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
18	Recreation	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
19	Traffic	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
20	Archaeology	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5
21	Native American concerns	FPR	1	2	3	4	5	FSC	1	2	3	4	5	SFI	1	2	3	4	5

A Comparison of California Forest Practice Rules and Two Forest Certification Systems

Written questions

1. What benefits do you expect to receive from certification?
2. Why did you choose the system that your land is/will be certified under?
3. What expertise, other than forestry, is required to gain certification under the system that your land is/will be certified?
4. What are the *time* requirements needed to meet standards in the California Forest Practice Rules versus that needed for certification?
5. What are the *monetary* requirements needed to meet standards in the California Forest Practice Rules versus that needed for certification?
6. What is the initial cost per acre to become certified? What is the annual cost necessary to maintain certification?
7. How would you describe the process for recertification (ease of representative contacts, meeting changes in requirements, etc.)?

8. Additional comments you would like to add:

Thank you for mailing completed survey to:

**Dr. Chris Dicus
Natural Resources Management Dept.
Cal Poly State University
San Luis Obispo, CA 93407**

**You may also e-mail completed survey to
“cdicus@calpoly.edu”**

If you would like further information or a report of the project please provide the following:

Name

E-mail address

Mailing Address

THANK YOU FOR HELPING US WITH THIS PROJECT!