

# Auditing for Sustainable Forest Management: The Role of Science

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## INTRODUCTION

Achieving forest sustainability has proved an elusive and contentious goal. Improving forest management globally offers a significant means of improving environmental, social, and economic conditions. International efforts to secure a forest convention have failed, however. In the United States, the goal of improving forest management is widely recognized, but the proper way to achieve it is hotly contested. Management of U.S. national forests, for example, is among the most controversial natural resource management issues.<sup>1</sup>

One of the most significant recent developments aimed at bringing about more sustainable forest management is forest certification. Certification serves as an indicator for consumers or other interested parties that specific operations or products satisfy the certifying entity's sustainability standards. Certified entities may enjoy improved market access or price premiums, which can provide an incentive to operate in a sustainable manner and obtain certification. Whether a particular operation will be deemed sustainable, and thus be certified, turns on an assessment, or audit, of whether its management complies with standards for sustainability set by the certification system. An effective auditing process is therefore an essential element of certification if it is to advance sustainable forest management.

In 2005, the U.S. Forest Service (USFS) dramatically changed its approach to national forest management, adopting an "adaptive management" paradigm. With this shift comes the need for an auditing process at the center of agency planning and project-level decisions. The USFS audits will share many characteristics with certification auditing, including a stated goal of sustainable

1. Perhaps the most potent example of controversy over national forest management centered on the spotted owl in the northwest. See, e.g., Brendon Swedlow, *Scientists, Judges, and Spotted Owls: Policymakers in the Pacific Northwest*, 13 DUKE ENVTL. L. & POL'Y F. 187 (2003). For a discussion of national forest management in California illustrating its controversial nature, see Lawrence Ruth, *Conservation on the Cusp: The Reformation of National Forest Policy in the Sierra Nevada*, 18 UCLA J. ENVTL. L. & POL'Y 1, 20-58 (2000).

management.<sup>2</sup>

Not all forest auditing regimes that aim to measure sustainability are necessarily equally effective. Among the core considerations in evaluating an auditing regime is the role that science plays in the process. The use of science in auditing establishes fundamental parameters of consistency and objectivity. The more effectively science is incorporated into an auditing regime, the more reliable one can expect audit results to be.

This study seeks to analyze the role of science in three auditing regimes, evaluate the differences between them, and draw lessons that can point the way toward more effective use of science in the auditing of forests for sustainable management. Part I provides background on the rise of forest certification as a mechanism to promote sustainability and on the role of sustainability in national forest management planning. Part II provides an overview of the auditing procedures of the two primary certification regimes in the United States. Part III provides an in-depth comparison of the role of science in certification auditing under these regimes. Part IV describes the framework for auditing established by USFS in 2005, including the role of science within it. Part V discusses the reasons for and implications of the differences between the certification auditing regimes, then draws upon this analysis to assess the new USFS regime and suggest how it can be improved. Part VI concludes that a consistent definition of sustainable forest management coupled with relatively detailed guidelines for auditors will provide the most verifiably accurate measure of sustainable forest management, which can produce a reliable certification system and, with proper mandates to adopt auditor recommendations, a sound approach to national forest management.

#### I. IMPORTANCE OF CERTIFICATION SYSTEMS AND THE NEW USFS APPROACH FOR ACHIEVING SUSTAINABLE FOREST MANAGEMENT

“Sustainability” refers to the concept that decisions should be made so as to meet present needs without compromising the ability of future generations to meet their needs.<sup>3</sup> It is commonly

2. See generally 36 C.F.R. pt. 219 (2005).

3. See, e.g., OUR COMMON FUTURE: THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT at ES-7 (Gro Harlem Brundtland, ed., 1987) (“[h]umanity has the ability to

discussed in terms of three elements: environmental, social, and economic.<sup>4</sup> The application of this concept to forests is an attempt to secure management of forests that will allow all three elements to be satisfied in perpetuity.

Forests are of unquestionable global significance because they provide a variety of essential services pertinent to all three elements of sustainability.<sup>5</sup> However, efforts to address concerns over the fate of the world's forests through traditional avenues of international law, such as treaties, have failed.<sup>6</sup> Political interest in such an agreement developed in advance of the 1992 Rio Earth Summit, for example, but the Summit ultimately reflected international disunity on the issue.<sup>7</sup> Despite concerted efforts by environmental NGOs leading up to Rio, what emerged was so obviously weak that many lost faith in the hope that a multilateral environmental agreement could begin to resolve global forest problems.<sup>8</sup> The 1992 Forest Principles, formally entitled the *Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests*, provided little more than recognition of the significance of forests as an environmental issue and, rather than firmly committing

make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.”).

4. For example, Agenda 21, adopted at the 1992 U.N. Conference on the Environment and Development (the Rio Earth Summit), includes a section on “Social and Economic Dimensions” of sustainable development, which addresses topics such as poverty eradication, and a section that discusses environmental considerations of sustainable development, such as deforestation. Agenda 21 adopted by United Nations Conference on Environment and Development, June 3–14, 1992, U.N. Dept. Econ. & Soc. Affairs, *available at* [www.un.org/esa/sustdev/documents/agenda2/english/agenda21toc.htm](http://www.un.org/esa/sustdev/documents/agenda2/english/agenda21toc.htm). USFS has also used this tripartite in its regulatory frameworks for sustainability. 36 C.F.R. § 219.10 (2005).

5. PHILIPPE SANDS, *PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW* 546 (2nd ed. 2003); U.N. Env't. Programme [UNEP], *Global Environmental Outlook 3: Past, Present and Future Perspectives* 90 (2002), *available at* <http://www.unep.org/geo/geo3/english/pdf.htm>; THE WORLD BANK, *SUSTAINING FORESTS: A DEVELOPMENT STRATEGY* 15–16 (2004) (discussing social and economic sustainability).

6. Radoslav S. Dimitrov, *Knowledge, Power and Interests in Environmental Regime Formation*, 47 *INT'L STUD. Q.* 123, 134–37 (2003).

7. *Id.* at 135.

8. See Steven Bernstein & Benjamin Cashore, *Non-State Global Governance: Is Forest Certification a Legitimate Alternative to a Global Forest Convention?*, in *HARD CHOICES, SOFT LAW: COMBINING TRADE, ENVIRONMENT, AND SOCIAL COHESION IN GLOBAL GOVERNANCE* (John Kirton & Michael Trebilcock, eds., 2005), *available at* [http://www.yale.edu/environment/cashore/pdfs/2004/04\\_kirton\\_sof\\_nce\\_chapter.pdf](http://www.yale.edu/environment/cashore/pdfs/2004/04_kirton_sof_nce_chapter.pdf) (“even prominent [NGOs] have withdrawn their support [for a forest convention], fearing a convention might do worse at promoting sustainable forest management than no treaty at all.”).

nations to international governance for sustainable forest management, reflected the lack of international consensus on the issue.<sup>9</sup> This problem remains starkly evident in the international institutions designed to continue multilateral efforts for improving forests.

Currently, the most important state-based international framework for addressing forest sustainability is the United Nations Forum on Forests (UNFF), under the auspices of the United Nations Economic and Social Council. UNFF was established in 2000 as part of an international arrangement on forests.<sup>10</sup> At the fifth session of UNFF in May 2005 (UNFF-5), participants intended to review the effectiveness of the international arrangement on forests and consider future actions, including the establishment of a legally-binding agreement.<sup>11</sup> European nations and Canada viewed UNFF-5 as an opportunity to work toward firm international commitments for the improvement of forest management and insisted at the outset that UNFF-5 yield significant changes in the status quo of global forest governance.<sup>12</sup> However, negotiations broke down and UNFF-5 did not even produce a significant statement of political commitment.

An important component of the failure to make significant progress at UNFF-5 was the consistent opposition of the United States to legally-binding international commitments. The United States “favored identifying flexible policies and actions at the national level, which would contribute to achieving agreed-upon objectives, rather than setting quantified international targets.”<sup>13</sup> In response to proposals for an international code of practice, for example, the United States refused to accept anything beyond a

9. See SANDS, *supra* note 5, at 548–49.

10. Under the UN Commission on Sustainable Development, forests were addressed through the Intergovernmental Panel on Forests (IPF) from 1995 to 1997 and the Intergovernmental Forum on Forests (IFF) from 1997 to 2000. See U.N. FORUM ON FORESTS [UNFF], ABOUT UNFF: HISTORY AND MILESTONES OF GLOBAL FOREST POLICY, available at <http://www.un.org/esa/forests/about.html>. UNFF was established following the Fourth Session of IFF by the Economic and Social Council Resolution 2000/35 and essentially builds upon the work of IPF and IFF. See *id.*

11. See, e.g., 13 Earth Negotiations Bull. 123 (May 16, 2005) available at [www.iisd.ca/download/pdf/enb13123e.pdf](http://www.iisd.ca/download/pdf/enb13123e.pdf).

12. 13 Earth Negotiations Bull. 133, 14 (May 30, 2005) available at <http://www.iisd.ca/download/pdf/enb13133e.pdf>.

13. 13 Earth Negotiations Bull. 127, 1 (May 20, 2005) available at <http://www.iisd.ca/download/pdf/enb13127e.pdf>; see also 13 Earth Negotiations Bull. 133,14.

general statement of political commitment. The code, originally conceived as a potential compromise that could avoid more contentious divisions, became one of the breaking points in negotiations as the gap between the United States and Brazil, at one extreme, and the E.U. and Canada, who sought a firm and detailed code, could not be bridged.<sup>14</sup>

The failure of UNFF-5, and particularly the position espoused by the United States, highlights the importance of alternative avenues for promoting sustainable forest management at both the national and global level. In this context, it becomes especially important to assess the strengths and weaknesses of the approaches advocated by the United States and, perhaps more pertinently, of current initiatives within the United States designed to improve on-the-ground forest conditions.

In the absence of a promising multilateral agreement, environmental NGOs and others have begun to promote certification of forests meeting specific criteria for sustainable management as a means to foster improved management. These non-state regimes represent one of the most important recent developments in global forest protection and non-state-based international governance. Along with forest certification efforts, national policies concerning forest management remain critically important to achieving the goal of sustainable forest management. In the United States, the most significant area in which sustainable management may flourish through governmental effort is the national forest system.

#### A. Promoting Sustainable Forestry Through Markets: The Functioning and Context of Forest Certification Systems

##### 1. Roots and Structure of Certification Regimes

Forest certification arose shortly after the disappointment at Rio as an effort by the environmentally concerned public in the North to promote protection of tropical forests in the South.<sup>15</sup> The first major international forest certification system was Forest Stewardship Council (FSC), created by a coalition of

14. 13 EARTH NEGOTIATIONS BULL. 133, 14.

15. See, e.g., Ewald Rametsteiner and Markku Simula, *Forest Certification—An Instrument to Promote Sustainable Forest Management?*, 67 J. ENVTL. MGMT. 87, 88 (2003).

environmental NGOs led by the World Wild Fund for Nature.<sup>16</sup>

FSC has ten internationally applicable principles of sustainable forest management.<sup>17</sup> The principles are very broad statements covering environmental, social and economic elements of sustainability through a fairly wide array of specific topics, including indigenous peoples' rights, workers' rights, distribution of forest benefits, environmental impact, the need for a management plan, and the need for monitoring and assessment.<sup>18</sup> The first nine of FSC's principles were ratified in 1994, the tenth was ratified in 1996.<sup>19</sup> The international body of FSC also established criteria, which are more detailed standards set under each principle.<sup>20</sup> Indicators for each criterion are developed at the national or regional level to provide more locally-specific standards.<sup>21</sup>

The structural design of FSC is important for understanding its

16. BENJAMIN CASHORE ET AL., GOVERNING THROUGH MARKETS: FOREST CERTIFICATION AND THE EMERGENCE OF NON-STATE AUTHORITY 11 (2004). The world's first forest certification system was actually the Rainforest Alliance's Smartwood Program, which began in 1989 and is now based in Richmond, Virginia. *Id.* See also SUSTAINABLE FORESTRY: SMARTWOOD, <http://www.rainforest-alliance.org/programs/forestry/smartwood/index.html> In California, Scientific Certification Systems (SCS) began its Forest Conservation Program two years later. CASHORE, GOVERNING, *supra* note 16, at 11; see also SCS Forest Certification Program, <http://www.scs-certified.com/forestry>. Subsequently, both of these organizations became certified auditors for FSC, as well as maintaining their own certification systems. See Jeffrey Hayward & Ilan Vertinsky, *High Expectations, Unexpected Benefits: What Managers and Owners Think of Certification*, J. OF FORESTRY, Feb. 1999, at 13 ("[a]ll FSC certification in the United States has been done under either the SmartWood Program . . . or the [program] implemented by Scientific Certification Systems . . . Both programs were accredited by the FSC in 1995 and follow its principles and criteria"). Rainforest Alliance was a player in the development of FSC and most of the certification work currently performed by SCS is under the FSC system. CASHORE, GOVERNING, *supra* note 16, at 11; telephone interview with Dr. Robert Hrubes, Senior Vice President, SCS, January 2005. Dr. Hrubes is a forester and resource economist who has served on FSC's board, worked in USFS, and played a large role in developing SCS's protocol for FSC audits. Technically, one could trace the history of certification in the United States to the creation of the American Tree Farm Association in 1941 (see RICK FLETCHER ET AL., FOREST CERTIFICATION IN NORTH AMERICA 1 (rev. ed. 2002), available at <http://eesc.orst.edu/agcomwebfile/edmat/EC1518.pdf>), but the context and function of that system is distinguishable from certification as it is discussed here.

17. FSC, FSC PRINCIPLES AND CRITERIA FOR FOREST STEWARDSHIP (April 2004) (FSC ref. code FSC-STD-01-001) [hereinafter FSC PRINCIPLES AND CRITERIA], available at [http://www.fsc.org/keepout/en/content\\_areas/77/71/files/FSC\\_STD\\_01\\_001\\_FSC\\_Principles\\_and\\_Criteria\\_for\\_Forest\\_Stewardship\\_2004\\_04.PDF](http://www.fsc.org/keepout/en/content_areas/77/71/files/FSC_STD_01_001_FSC_Principles_and_Criteria_for_Forest_Stewardship_2004_04.PDF). 1.

18. *Id.*

19. *Id.* Principle 9 was amended and two criteria were added to Principle 10 in 1999. *Id.*

20. *Id.*

21. The national and regional criteria applicable in the United States are available through the FSC-US website at [http://www.fscus.org/standards\\_criteria/](http://www.fscus.org/standards_criteria/).

vision of sustainable forest management and how to achieve it. FSC governance structure seeks to give equal voting weight to representatives of environmental, social, and economic interests.<sup>22</sup> The primary international body of FSC is the general assembly, whose membership is divided into three chambers (environmental, social, and economic).<sup>23</sup>

FSC also has national bodies, as well as regional working groups. The primary purpose of these bodies is to establish national and/or regional indicators, which are standards developed under the criteria established by the international body.<sup>24</sup> Under the FSC system, the principles, criteria and indicators are all standards to be applied in assessing compliance.

Globally, FSC retains fairly universal support from environmental NGOs as a preferred alternative to its competitors, but industry support for FSC varies by region.<sup>25</sup> For example, the forest industry has moved in significant ways toward acceptance of FSC in the United Kingdom, Sweden, and parts of Canada, but has remained staunchly opposed to FSC certification in Germany and the United States.<sup>26</sup>

## 2. Forest Certification Systems in the U.S. Context: FSC & SFI

In the United States, FSC adopted a regional, multi-level approach consisting of nine regional working groups that develop region-specific standards, as well as a national office, rather than the more nationally-centered approach adopted in most other

22. *Id.* It also includes equal representation of northern and southern stakeholders. *Id.* It is worth noting that the inclusion of both industrial forest companies and non-industrial forest landowners, who are the interests that have to implement FSC decisions, into one “economic interests” category has created considerable tension among economic interests and may play some role in their critiques of FSC. CASHORE, GOVERNING, *supra* note 16, at 12. For a critique of FSC from the other end of the spectrum, see THE RAINFOREST FOUNDATION, TRADING IN CREDIBILITY: THE MYTH AND REALITY OF THE FOREST STEWARDSHIP COUNCIL (2002), available at <http://www.rainforestfoundationuk.org/files/Trading%20in%20Credibility%20full%20report.pdf>.

23. FSC: Governance, <http://www.fsc.org/en/about/governance> (last checked 2/15/2006).

24. CASHORE, GOVERNING, *supra* note 16, at 12.

25. See generally, Benjamin Cashore et al., *Forest Certification (Eco-Labeling) Programs and Their Policy-Making Authority: Explaining Divergence Among North American and European Case Studies*, 5 FOREST POL’Y & ECON. 225 (2003).

26. CASHORE, GOVERNING, *supra* note 16, at 6–7. A primary focus of the book is to make sense of this divergence, thus many passages are relevant to this point.



countries.<sup>27</sup> This increased support from environmental groups, who viewed the relative autonomy of the regional working groups as advantageous, but also increased resistance from industry and forestland owners, who viewed the multi-level governance structure as unduly cumbersome and inefficient.<sup>28</sup>

Industry was active in the development of certification, despite its resistance to FSC. Beginning in 1993, the American Forest and Paper Association (AF&PA) devoted significant effort to developing its alternative to FSC, the Sustainable Forestry Initiative (SFI), and to securing its status as legitimate.<sup>29</sup> While SFI began as a voluntary system giving vast discretion to entities seeking certification, over the course of several years it adopted several features that allow it to be presented as a serious alternative to FSC, such as a fully developed set of standards for auditing and the accreditation of independent third-party auditors.<sup>30</sup>

Currently, SFI standards include nine principles, which provide over-arching guidance and are not directly applied as standards during the audits, as well as thirteen objectives used in audits, with several performance measures under each and several indicators under each performance measure.<sup>31</sup> Seven of the objectives concern land management.<sup>32</sup> The others address topics such as public and landowner involvement, training and education, and research.<sup>33</sup>

The SFI standards are set by the Sustainable Forestry Board (SFB).<sup>34</sup> SFB has fifteen members, five of which represent SFI participants (forestry operations that hold SFI certificates).<sup>35</sup> The

27. *Id.* at 102–103.

28. *Id.*

29. *Id.* at 101.

30. *See id.* at 106–07 (summarizing the actions of this type taken by SFI in table form); *see also* Fletcher et al., *supra* note 16, at 2 (grouping SFI and FSC together as more stringent than other programs because they both have extensive specific indicators that must be met). While all AF&PA members must participate in SFI, third-party auditing remains voluntary under SFI. This paper does not discuss the first and second-party auditing options under the SFI system.

31. SUSTAINABLE FORESTRY INITIATIVE, SUSTAINABLE FORESTRY INITIATIVE STANDARD: 2005–2009 STANDARD at 3–11, [hereinafter SFI, 2005–2009 STANDARD] *available at* <http://www.aboutsfb.org/generalPDFs/SFBStandard2005–2009.pdf>.

32. *Id.* at 4–7.

33. *Id.* at 7–12.

34. SUSTAINABLE FORESTRY INITIATIVE, SFI PROGRAM, <http://www.aboutsfb.org/sfiprogram.cfm>.

35. SUSTAINABLE FORESTRY INITIATIVE, About the Sustainable Forestry Board,

other ten members are evenly divided between representatives of environmental nonprofits and members of the broader forestry community.<sup>36</sup>

What followed from the parallel development of FSC and SFI in the United States has been characterized as a competition for legitimacy. The contest between the two major certification systems in the United States exhibits a great degree of polarization in terms of acceptance among environmental interests and the forest industry.<sup>37</sup>

FSC, with a firm base in the environmental community, took various steps in an effort to increase support for its system in the broader community and to bring industrial forestry operations into its system. FSC scored some significant victories, such as adoption of procurement policies that clearly preferred FSC certification by Home Depot and other major U.S. retailers in 1999.<sup>38</sup> However, FSC has had consistent difficulty gaining significant support from U.S. forest industry and landowners.<sup>39</sup>

SFI, on the other hand, has made slow but steady progress in gaining increased acceptance even among environmental NGOs (although they still overwhelmingly tend to prefer FSC).<sup>40</sup> Throughout its existence, SFI has made a variety of changes aimed at becoming a serious competitor with FSC and less vulnerable to criticism by environmentalists. It moved to allow third-party auditing, worked to internationalize itself, and actively sought participation of some of the more conservative environmental groups, such as The Nature Conservancy.<sup>41</sup> These moves all tended to decrease the perception of SFI as an industry-controlled system.

Currently, vastly more U.S. forestland is certified by SFI than by FSC. In the United States, SFI has certified approximately 39 million acres,<sup>42</sup> while FSC has certified less than 14 million acres.<sup>43</sup>

<http://www.aboutsfb.org/aboutsfb.cfm>.

36. *Id.*

37. CASHORE, GOVERNING, *supra* note 16, at 89.

38. *Id.* at 111–12.

39. FSC has maintained fairly steady support from a small number of landowners and members of the forest industry, but these offer little more than a niche market opportunity, rather than the broader appeal FSC seeks. *Id.* at 112–13.

40. *Id.* at 115, 117.

41. CASHORE, GOVERNING, *supra* note 16, at 104–121 (particularly tabular summary at 106–08).

42. Sustainable Forestry Board, The 2003–2004 Annual Report of the Sustainable Forestry Board, Inc., 9, available at [http://www.aboutsfb.org/generalPDFs/SFB%20Annual%](http://www.aboutsfb.org/generalPDFs/SFB%20Annual%20Report.pdf)

This disparity probably results largely from the firm support of industry for SFI and the preference for SFI certification by small landowners.<sup>44</sup> Additionally, the SFI auditing process may be more attractive to landowners because it is less expensive. One auditor estimated that the auditing process alone costs thirty percent more under FSC than SFI and that even greater cost differences would be felt in the need to make changes on the land to comply with the systems.<sup>45</sup>

While the amount of land under each system is certainly one significant measure of success, it does not necessarily reflect the impact of each system on management practices in a way that broadly promotes sustainable management. Perhaps more importantly, it does not reflect the degree to which certification ensures that management within a certified operation is actually sustainable. Measuring success in those terms is much more difficult.

## B. Sustainability and U.S. National Forest Management

Forest certification regimes in the United States do not operate on national forest lands.<sup>46</sup> However, the U.S. Forest Service (USFS)

20Report%2003-04.pdf. This refers to land certified through third-party auditing. If other certification is included, SFI has certified approximately 63 million acres in the United States. Id.

43. FSC-Certified Forests in the U.S., 1 (2005). According to FSC's brochure, 10 YEARS OF FSC: 1993-2003, over 15 million hectares had been certified in North and South America combined as of July 2004. FSC, *10 Years of FSC: 1993-2003* at 6, available at [http://www.fsc.org/keepout/en/content\\_areas/88/1/files/10\\_Years\\_of\\_FSC\\_\\_final.pdf](http://www.fsc.org/keepout/en/content_areas/88/1/files/10_Years_of_FSC__final.pdf).

44. Non-industrial private interests own fifty-eight percent of productive forestland in the United States, while industry owns thirteen percent. CASHORE, GOVERNING, *supra* note 16, at 94. Among private landowners in the United States, who are the major source of U.S. wood, more than eighty percent manage relatively small parcels for nontimber benefits. For them, the costs of certification appear prohibitive (especially under the more expensive FSC program) while the benefits remain difficult to assess, at best. *See, e.g.*, Fletcher, *supra* note 16, at 5. Of course, one could also argue that SFI has certified more land than FSC because SFI certification is easier to obtain due to a less demanding set of standards and less rigorous auditing procedures. *See* discussion *infra* section III.

45. Telephone interview with Michael Ferrucci, May 24, 2005. Mr. Ferrucci is a partner in both Interforest, LLC, which provides a wide variety of forestry consultation services (including certification audits), and Ferrucci & Walicki, LLC, a land management company that serves private landowners. Mr. Ferrucci has been involved in numerous audits under both FSC and SFI and is a lecturer on forestry at the Yale School of Forestry and Environmental Studies.

46. The decision not to bring certification to U.S. national forests was made early in the development of FSC in the United States, primarily because of environmentalist desire to maintain pressure for improvement of USFS management from within. CASHORE,

has incorporated sustainability, defined along the same lines as it is defined by certification regimes, into its management vision. Through the planning regulations promulgated under the National Forest Management Act, USFS has established sustainability as a major goal in the legal framework that controls on-the-ground management of the national forests.

In 2000, USFS adopted regulations that firmly embraced sustainability and gave priority to ecological sustainability factors.<sup>47</sup> Recently, however, USFS has adopted a new approach to management that gives equal weight to the three components of sustainability and assigns a major role to auditing of forest conditions, thus creating significant parallels between a major aspect of its forest management and the oversight provided by certification regimes.<sup>48</sup> There is no significant experience with auditing under the new regulations yet, but by examining the framework they establish we are able to consider a third approach to auditing for sustainability in U.S. forests. Further, the experience with certification audits provides a basis for evaluating the auditing regime established by the 2005 regulations.

The 2005 planning rule (which formally announced the new regulations) firmly embraces the concept of “adaptive management,” which it defines as “[a]n approach to natural resource management where actions are designed and executed and effects are monitored for the purpose of learning and adjusting future management actions, which improves the efficiency and responsiveness of management.”<sup>49</sup> Although not explicitly stated in the regulations, the goal of adaptive management under the USFS system is to achieve sustainability of the forests.<sup>50</sup>

GOVERNING, *supra* note 16, at 95.

47. *See generally* USFS, Final Rule: National Forest System Land Management Planning, 65 Fed. Reg. 67,514 (Nov. 9, 2000) (to be codified at 36 C.F.R. pts. 217 & 219). Particular examples of this emphasis include 36 C.F.R. § 219.19 (2001) (“[s]ustainability . . . is the overall goal of management of the National Forest System”) and 36 C.F.R. § 219.20 (2001), which provides significantly greater detail concerning the need to ensure ecological sustainability than the combined provisions for economic and social sustainability in 36 C.F.R. § 219.21 (2001).

48. *See* USFS, Final Rule: National Forest System Land Management Planning, 70 Fed. Reg. 1023 (Jan. 5, 2005) (to be codified at 36 C.F.R. pt. 219) [hereinafter “USFS Rule”].

49. 36 C.F.R. § 219.16 (2005).

50. *See* 36 C.F.R. § 219.1(b) (“the overall goal of managing the National Forest System is to sustain the multiple uses of its renewable resources in perpetuity while maintaining the long-

The preamble to the rule describes the principles upon which it is based. It states that plans should be “strategic in nature,” setting forth goals and guidance as to how they can be met.<sup>51</sup> Further, plans “must be adaptive and based on current information and science,” which the preamble explains can be enhanced through an environmental management systems approach.<sup>52</sup> Overall, the plans are to “guide sustainable management” of national forests.<sup>53</sup>

The required components of the plans are: desired conditions, objectives, guidelines, suitability of areas, and special areas.<sup>54</sup> The desired conditions are aspirational goals for management to achieve, but are not commitments.<sup>55</sup> Objectives are more concrete in that they are time-specific and describe intended outcomes, but, again, they are not commitments.<sup>56</sup> The term “guidelines” is used in the rule to describe factors that should be considered in making specific decisions under the plan.<sup>57</sup> USFS used that term, rather than “standards,” “to reflect a more flexible menu of choices consistent with the nature of plans set forth in this rule.”<sup>58</sup> The final two plan components relate to identification of uses appropriate to particular areas.<sup>59</sup> Together, these components can be viewed as roughly equivalent to the more detailed standards set by certification systems (except that they are not requirements).

As discussed in more detail in Section IV below, the 2005 regulations require USFS to use monitoring and evaluations to provide information that informs the creation of plans and assess whether management practices are meeting the standards established in the plans. Particularly in this second sense, the USFS

term productivity of the land”); *see also* 36 C.F.R. § 219.3(a) (2005).

51. USFS Rule, 70 Fed. Reg. at 1024.

52. *Id.* at 1025. An environmental management system is “[t]he part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy of the planning unit.” *Id.* at 1061. While this has some significance for USFS forest auditing, the monitoring and evaluation requirements express the core requirements that are relevant in a comparison with certification auditing. For more information on environmental management systems and USFS, see <http://www.fs.fed.us/emc/nepa/ems/index.htm>.

53. USFS Rule, 70 Fed. Reg. at 1025.

54. *Id.* at 1024.

55. *Id.* at 1025.

56. *Id.* at 1026.

57. *Id.*

58. *Id.*

59. *Id.* at 1026–27.

procedure has meaningful similarities to the role of auditing in certification regimes.

## II. OVERVIEW OF CERTIFICATION AUDITING

The basic goal of auditing is to assess whether management practices in a forest satisfy the regime's standards for sustainability. It is the process by which certification regimes determine whether a forest management operation will be certified.<sup>60</sup>

The main body of data used for an audit is collected by the entity seeking certification.<sup>61</sup> If an entity becomes certified, it will be subject to significant monitoring requirements that will provide data for future audits.<sup>62</sup> The auditing team reviews this data, consisting of relevant field data and documents, in terms of the methods used to collect and assess it, and conducts a degree of "field testing" to ensure its accuracy.<sup>63</sup> Auditors also interview members of the entity seeking certification, as well as the people responsible for collecting the primary data.<sup>64</sup>

### A. FSC Auditing

The FSC auditing process has been described according to seven distinct phases. These are: (1) pre-assessment/preliminary evaluation; (2) closing gaps; (3) stakeholder consultation; (4) the main assessment/full evaluation; (5) the evaluation report and peer review; (6) certification (once all prior phases lead to a finding of conformance); (7) ongoing surveillance or maintenance

60. This paper discusses only third-party certification auditing, not SFI's other auditing options. First-party auditing, in which the operation audits itself, and second-party auditing, in which a trade group or other associated entity performs the audit, provide a much less independent, and thus less reliable, assurance of sustainable management.

61. Ruth Nussbaum, *Forest Certification: Verifying "Sustainable Forest Management"* 5 (2000) (paper presented at the workshop on "Streamlining Local-Level Information for Sustainable Forest Management", Aug. 28–30, 2000, University of British Columbia, Canada, available at <http://www.gtz.de/de/dokumente/en-d48-forest-certification-verifying-sustainable-forest-man.pdf>). Because it relies on a voluntary undertaking by managers, any certification regime must limit the amount of resources it demands of entities seeking certification and thus cannot involve field research as in-depth as an academic study. Telephone interview with Dr. Hrubes, *supra* note 16.

62. FSC PRINCIPLES AND CRITERIA, Principle 8, *supra* note 17 at 6–7; SFI, 2005–2009 STANDARD, Objective 13, *supra* note 31 at 11. FSC monitoring requirements tend to be more stringent than SFI's. Telephone interview with Michael Ferrucci, *supra* note 45.

63. Nussbaum, *supra* note 61, at 5.

64. *Id.*

visits throughout the certification period.<sup>65</sup>

Initially, the auditing organization and the entity communicate in order to provide the auditors with an opportunity to gain information necessary for planning the main audit, which may involve one to five days of field evaluation, as well as to give the entity an understanding of the auditing process.<sup>66</sup> It is also an opportunity for identification of gaps between existing circumstances and the requirements for certification, which the entity will then be able to close before certification (or decide that it no longer wishes to seek certification).<sup>67</sup> If the entity continues to seek certification, a process of consultation begins in which the auditor receives comments from the interested public on the entity's performance and the criteria that the auditor will employ, which may raise concerns regarding specific standards.<sup>68</sup>

The main assessment proceeds over the course of anywhere from a day to several weeks and may result in findings of non-compliance with certain standards, which will lead to corrective action requests, also referred to as pre-conditions or conditions.<sup>69</sup> These can be either minor (requiring correction within a specified time, but not preventing certification), or major (requiring correction before the entity can be certified).<sup>70</sup>

Following the main audit, the certifier must prepare a report that is sent for peer review by at least two independent specialists in various fields.<sup>71</sup> The report must also contain a public summary (the main report is proprietary) and a discussion of actions taken to address non-compliance.<sup>72</sup> If all the previous steps are satisfactorily completed, the applicant can be certified for a period of up to five years (the period is set by the auditor) and will be subject to

65. Nussbaum, *supra* note 61, at 6–7. Dr. Nussbaum was formerly the director of SGS QUALIFOR, an assessor for FSC that is active in more than 60 countries. The description of FSC certification in her work describes the process followed by SGS QUALIFOR, but also reflects what FSC requires of its auditors as expressed in FSC-STD-20-007, FOREST MANAGEMENT EVALUATION (2004). These categories are essentially parallel to the SCS auditing process. See SCS Forest Conservation Program, Certification Manual, QS-03-01, at 15–25 (May 6, 2005), available at [http://www.scs-certified.com/PDFS/forest\\_certification\\_manual.pdf](http://www.scs-certified.com/PDFS/forest_certification_manual.pdf).

66. Nussbaum, *supra* note 61, at 6; SCS Certification Manual, *supra* note 65, at 15–16.

67. Nussbaum, *supra* note 61, at 6.

68. *Id.*

69. *Id.* at 6–7; SCS Certification Manual, *supra* note 65, at 19–20, 22–33.

70. Nussbaum, *supra* note 61, at 7; SCS Certification Manual, *supra* note 65, at 20.

71. Nussbaum, *supra* note 61, at 7; SCS Certification Manual, *supra* note 65, at 19.

72. Nussbaum, *supra* note 61, at 13, 18.

mandatory annual review audits and potential unscheduled audits.<sup>73</sup> Under the FSC system, the final certification decision is made by a committee comprised of non-team-members drawn from the auditing body, based on the recommendation of the auditing team.<sup>74</sup>

## B. SFI Auditing

The structure of auditing under the SFI system follows similar stages, but is distinguishable from FSC primarily by increased involvement of the entity seeking certification and greater flexibility.<sup>75</sup> Additionally, SFI auditing involves significantly less consultation with the stakeholders<sup>76</sup> and there is no peer review of the final report.

Prior to an SFI audit, the auditing firm will work jointly with the entity seeking certification (referred to as a “program participant”) to determine the objectives and scope of the audit to be performed.<sup>77</sup> The auditing firm is responsible for insuring that the determination applies “all relevant portions” of mandatory SFI standards at “an appropriate geographic scale” that allows for an “accurate field determination of conformance for the entire operating unit” to be certified.<sup>78</sup> In this process, however, program participants may modify SFI indicators “to address local conditions” with the auditors’ consent.<sup>79</sup> A plan for completing the audit is developed jointly by the auditors and the participant.<sup>80</sup>

For the main assessment, the auditing firm determines whether the program participant is in compliance with the relevant SFI

73. 1 MERIDIAN INSTITUTE, COMPARATIVE ANALYSIS OF THE FOREST STEWARDSHIP COUNCIL AND SUSTAINABLE FORESTRY INITIATIVE CERTIFICATION PROGRAMS 32 (2001).

74. *Id.*

75. SFI recently updated its audit procedures. See SFI, AUDIT PROCEDURES AND QUALIFICATIONS along with its 2005–2009 STANDARD, *supra* note 31, available at <http://www.aboutsf.org/generalPDFs/SFBStandard2005-2009.pdf>. However, most of the procedures outlined in the previous documents remain relevant—the most notable change is the move from first and second party verification to an exclusive focus on third-party certification in the 2005 document. See generally SFI, THE SUSTAINABLE FORESTRY INITIATIVE VERIFICATION/CERTIFICATION PRINCIPLES AND PROCEDURES 2002–2004 (2002); SFI, 2001 EDITION SFI VERIFICATION PROCESS (2001).

76. Telephone interview with Michael Ferrucci, *supra* note 45.

77. SFI, 2005–2009 STANDARD, *supra* note 31, at 22.

78. *Id.*

79. *Id.*

80. 3 MERIDIAN INSTITUTE 36 (2001), available at [http://www.merid.org/comparison/FSC\\_SFI\\_Comp\\_Analysis-Volume\\_III.pdf](http://www.merid.org/comparison/FSC_SFI_Comp_Analysis-Volume_III.pdf); see SFI, 2005–2009 STANDARD, *supra* note 31, at 22.



standards.<sup>81</sup> The auditors may identify major nonconformances, which must be corrected prior to certification, or minor nonconformances, which the participant must agree to correct within one year in order to be certified.<sup>82</sup> Following the audit, the auditors and participant meet to discuss the findings and to resolve differences or disputes, but the auditors retain final authority over the findings.<sup>83</sup> The auditors file a confidential report detailing the objective, scope, processes, findings, and other information pertinent to the audit.<sup>84</sup> In order to make public statements or claims regarding the SFI certification, a participant must supply a report discussing the audit to SFB, which is then made public.<sup>85</sup> The participant is then subject to surveillance audits at least every eighteen months.<sup>86</sup> In order to maintain certification, the participant must either undergo a complete recertification every five years, or may rely on surveillance audits for recertification if each SFI standard has been fully reassessed within the five year period through such audits.<sup>87</sup>

### III. THE ROLE OF SCIENCE IN AUDITING UNDER THE FSC AND SFI CERTIFICATION SYSTEMS

Scientific methodology and information serve as tools to an auditor seeking to verify whether on-the-ground practices comply with pre-established standards. The role of science in an audit can be understood functionally to include the type of data used, the methodology applied in assessing that data and in testing its validity, and the process employed to reach a conclusion as to whether the operation satisfies the standards applied. The more completely the auditing procedures incorporate scientific principles, the more likely auditing results will be objective and replicable. In auditing designed to test for sustainability, the “science” that is relevant will cover assessment of environmental, social, and economic elements. There are three broad avenues

81. SFI, 2005–2009 STANDARD, *supra* note 31, at 22.

82. *Id.* at 23.

83. 3 MERIDIAN INSTITUTE 37 (2001). Other interested or relevant parties may also be involved in the meeting. This procedure apparently remains a standard part of the auditing process, although it is not explicitly mentioned in more recent SFI documents.

84. SFI, 2005–2009 STANDARD, *supra* note 31, at 23.

85. *Id.* at 24.

86. *Id.* at 23.

87. *Id.*

through which science enters the auditing process under each regime: auditing procedures established by the certification system, the standards against which management is assessed, and requirements concerning the accreditation of auditing firms and the qualification of auditors.

#### A. Auditing Procedure

Both certification systems rely on independent auditing organizations to develop detailed protocols for use in particular audits. Nonetheless, the certification systems can control the extent to which science is used in an audit through specific data or methodology requirements, as well as more general requirements for verification of forest managers' assessments and planning. There is a threshold difference between the two certification regimes that drives the discussion below: FSC has recently provided fairly detailed requirements aimed at ensuring that all audits conducted under its standards are objective and consistent,<sup>88</sup> but SFI guidance regarding audit procedure remains quite limited.

The main evaluation in an FSC audit involves a characterization of the forest management units (FMUs) within the audit area, selection and evaluation of some FMUs, and evaluation of the operation's management system.<sup>89</sup> The first step is analysis and description of all FMUs within the area to be evaluated, including their forest type and the systems in place to manage them.<sup>90</sup> The next step is an analysis of the requirements for effective systems to assure compliance with FSC standards, followed by determination of whether the manager has the capacity to carry out and is actually carrying out such management effectively.<sup>91</sup> FSC then requires that auditors characterize FMUs into groups and select a set of FMUs within each group for assessment.<sup>92</sup> The selection of FMUs to assess

88. FOREST MANAGEMENT EVALUATION, *supra* note 65, at 1.

89. *Id.* at 3–7. Audits may also cover only one FMU, in which case the full audit concentrates on that FMU. The requirements under FSC's recently developed SLIMF project are somewhat less demanding. *See generally* FSC SLIMF Streamlined Certification Procedures: Summary (2004) (FSC ref. code FSC-POL-20-101).

90. FSC FOREST MANAGEMENT EVALUATION, *supra* note 65, at 3.

91. *Id.* at 4.

92. *Id.* at 5–6. The document states that sampling of all FMU sets that do not completely meet small and low intensity managed forest criteria shall follow the sampling requirements for group certification audits. If the FMU set does meet such criteria, sample number is determined by a formula set by FSC. *See id.* at 5.

begins with a determination of an appropriate minimum number of FMUs for assessment (the sample), which is based on the number of FMUs in the group, the need to produce a reliable assessment and other factors.<sup>93</sup> Where there are less than 100 individual forest areas in a group, this will normally require assessment of at least one third of the individual areas.<sup>94</sup> The auditor must employ a degree of randomization when determining which specific FMUs to assess and must ensure that the sample is representative of the geographic and management characteristics of the entire area.<sup>95</sup> Further, the auditor must directly investigate any specific allegations of violations that are received (through stakeholder consultation, for example).<sup>96</sup> The auditor is not necessarily required to determine compliance with all of the FSC principles and criteria for each FMU.<sup>97</sup> Instead, the auditor must ensure that all standards are applied to each set of like FMUs and explicitly justify the non-application of any standards to particular FMUs.<sup>98</sup>

In actually evaluating specific FMUs, the auditor's task is divided into document review, field assessment, and stakeholder consultation.<sup>99</sup> The core requirement for document review and field evaluation is that the auditor review sufficient documentation and visit a sufficient number and variety of sites to "make direct, factual observations" to verify compliance with the standards evaluated in the given FMU.<sup>100</sup> Field assessment must be sufficient to make direct observations "over the range of conditions under management" by the auditee, such as productive forests with various geographic characteristics and at various stages of re-growth, protected areas and areas surrounding waterways.<sup>101</sup>

Through these required auditing procedures, FSC's audit system focuses on use of scientific methodology to secure a strong and representative set of data concerning both the management system and the actual forest conditions. The explicit purpose of providing

93. *Id.* at 5, 11–12.

94. *Id.* at 11. Deviation from this requirement is allowed, but must be explicitly justified.

95. *Id.* at 5.

96. *Id.*

97. *Id.* at 6.

98. *Id.* However, for group certification full evaluation of each location may be required.

99. *Id.* at 6.

100. *Id.*

101. *Id.*

guidance on the auditing process is “to reduce the level of subjectivity and reduce the appearance of inconsistency between sampling levels implemented by different certification bodies in different situations.”<sup>102</sup> FSC auditors are now required to select samples using a methodology that guarantees a level of objectivity, such as randomness and a careful calculation of a sample size sufficient to secure accurate verification. Additionally, audit conclusions under the FSC system must be based in significant part on data gathered through direct observation,<sup>103</sup> thus ensuring an accurate data set and providing meaningful verification of the methodology and conclusions in information provided by the auditee.

SFI has provided much less guidance on audit procedure. SFI requirements state generally that auditing shall proceed according to an “evidence-based approach.”<sup>104</sup> Any particular audit under SFI must be planned in advance through a joint effort between the auditors and the auditees.<sup>105</sup> The auditors are to ensure that the plan “allow[s] for accurate field determination of conformance for the entire operating unit” and whether the auditee “has effectively implemented its SFI Standard program requirements on the ground.”<sup>106</sup> Beyond these requirements, the only guidance for auditing is that auditors must assess each element of the SFI standards during an audit.<sup>107</sup>

In contrast to FSC, the specific requirements for the SFI auditing procedure do not address questions of methodology in sampling. SFI does provide a general requirement for field-testing data and examining on-the-ground conformance.<sup>108</sup> However, as the next section demonstrates, the SFI standards set very few requirements in regard to forest conditions, so the relevant data and conclusions will be focused almost exclusively on the presence of a

102. *Id.* at 1.

103. *See, e.g., id.* at 6 (“The auditor(s) shall visit a sufficient variety and number of sites within each FMU selected for evaluation as to make direct, factual observations as to compliance with all indicators of the applicable Forest Stewardship Standard that are under evaluation at that FMU and for which such inspection is a necessary means of verification, over the range of conditions under management by the applicant forest management enterprise”).

104. SFI, 2005–2009 STANDARD, *supra* note 31, at 21.

105. *Id.* at 22.

106. *Id.*

107. *Id.*

108. *See id.*

management system. Nothing in SFI's standard explicitly requires verification of auditees' conclusions regarding the impact of management on forest conditions or even of the data upon which such conclusions are based.

A further indication of FSC's greater emphasis on the scientific credibility of its audits is the extensive reporting requirements it has developed.<sup>109</sup> FSC provides a detailed, five-page list of specific information that must be provided in each audit report.<sup>110</sup> For example, auditors must provide a "[c]lear and systematic presentation of observations and considerations on which the certification decision is based" and "[e]xplicit identification and discussion of any issues that were hard to assess . . . and explanation of the conclusion reached."<sup>111</sup> SFI's reporting requirements are stated in a brief paragraph, which contains no reference to assurances of scientific credibility.<sup>112</sup> Further, FSC requires peer review of all audit reports for initial certification.<sup>113</sup> SFI does not.

## B. Standards and Science

Most distinctions concerning the role of science under the certification regimes are related to differences in the standards that the regimes have set. By establishing the measures against which management practices are judged, the standards determine the specific types of data that must be assessed and suggest the methodology required to assess them.

### 1. Environmental Standards

FSC clearly defines its interpretation of environmental sustainability in terms of maintaining ecological productivity of natural forests. For example, FSC's Principle 6, Environmental Impact, states: "Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain

109. See generally FSC, FOREST CERTIFICATION REPORTS (2004) (FSC ref. code FSC-STD-20-008), available at [http://www.fsc.org/keepout/en/content\\_areas/77/13/files/FSC\\_STD\\_20\\_008\\_Forest\\_certification\\_reports\\_V1\\_0.PDF](http://www.fsc.org/keepout/en/content_areas/77/13/files/FSC_STD_20_008_Forest_certification_reports_V1_0.PDF).

110. *Id.* at 3–9.

111. *Id.* at 7–8.

112. SFI, 2005–2009 STANDARD, *supra* note 31, at 23.

113. FSC ACCREDITATION MANUAL, Part 3.2, Section 11.

the ecological functions and the integrity of the forest.”<sup>114</sup> As elaborated in criteria and indicators, the role of auditing under this approach is largely to assess whether forest conditions indicate compliance with FSC’s definition of environmental sustainability.

SFI embraces flexibility throughout its standards, requiring much less assessment of forest conditions. For example, SFI requires that participants have “programs to promote biological diversity.”<sup>115</sup> Contrasting this with FSC’s criterion that such diversity “shall be maintained”<sup>116</sup> reveals the flexibility in SFI’s approach. This difference in the standards translates into a significant difference in the demand for scientific assessment during the audit, in terms of both data requirements and analytical methodology.

An audit under FSC’s biodiversity standard seeks to assess whether diversity is actually maintained, whereas an SFI auditor need only review the existence of a program that is credibly aimed at promoting diversity. Given the nature of the FSC standard, a competent audit apparently requires data concerning the biological diversity of the area at several points in time, which must then be analyzed to determine whether diversity has been maintained.<sup>117</sup> Under the SFI standard, in contrast, most data can be drawn from the operation’s planning documents because the auditor need only assess the existence of the plan reasonably aimed at protecting biodiversity.<sup>118</sup> Auditing to FSC’s standard requires a more penetrating analysis of forest conditions. SFI’s standard only requires assessment of the operation’s efforts to address such conditions, without explicitly tying standards to an operation’s actual impact.

Other standards pertaining to biodiversity protection further illustrate that FSC standards contemplate a more penetrating look into the success of measures taken to protect the environment, whereas SFI standards call only for verification that measures in place are intended to achieve protection and apparently rely on the participant to judge success for itself. For example, FSC requires safeguards “which protect” threatened and endangered species including “[c]onservation zones and protection areas.”<sup>119</sup> SFI

114. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 4.

115. SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (Performance Measure 4.1).

116. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.3).

117. *Id.*

118. SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (Objective 4).

119. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.2).

requires a “[p]rogram to protect”<sup>120</sup> such species and “[p]lans to locate and protect known sites associated with viable occurrences of critically imperiled and imperiled species and communities.”<sup>121</sup>

Under the FSC standards, auditors must secure a sufficient scientific basis to conclude that the measures taken to protect endangered species are reasonably successful. Along with data concerning the presence of threatened or endangered species, auditing to FSC’s standard requires data sufficient to conduct an evaluation of whether protection areas are well-suited to and sufficient for protection of those species. To do this, an auditor needs to verify the accuracy of specific data, such as the characteristics of protection areas. The ultimate evaluation under the FSC standard necessarily entails application of ecology and/or wildlife biology principles, culminating in a judgment of whether the data supports a conclusion that the threatened or endangered species is actually being adequately protected.

Under the SFI biodiversity standards, auditors need not judge success, just the presence of programs, plans and assessments. An evaluation of whether these measures are sufficient to achieve protection is not required. Indeed, SFI only requires planning to protect “known sites” where imperiled species’ populations are “viable,” which suggests that the auditor’s job is to work from data collected by the manager without any significant verification of its accuracy. Ultimately, the auditor need only ensure that the forestry operation has given some attention to protection of species diversity through programs and plans to locate and protect imperiled species. Nothing in SFI’s standard suggests that an auditor must conduct an independent analysis of the sufficiency and validity of plans or programs to protect species. In other words, independent scientific assessment of whether the species are being protected is not called for by SFI—there is not even an explicit requirement that auditors assess the validity and robustness of managers’ determinations on this point.

The two certification regimes also set different standards for protection of ecosystem diversity. FSC requires that “[r]epresentative samples of existing ecosystems within the

120. SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (SFI Performance Measure 4.1, Indicator 2).

121. SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (SFI Performance Measure 4.1, Indicator 3).

landscape shall be protected in their natural state.”<sup>122</sup> SFI requires a “[p]rogram to promote the conservation of . . . ecological or natural community types[,]”<sup>123</sup> as well as “[a]ssessment . . . of forest cover types and habitats . . . and incorporation of findings into planning and management activities, where practical and when consistent with management objectives.”<sup>124</sup>

Auditing to the FSC standard requires an inventory of existing ecosystems and an analysis of what is required to protect a “representative sample.”<sup>125</sup> This will frequently be a complex analysis because the auditor must first determine what constitutes a distinct ecosystem and what its components are, then assess whether measures taken to protect samples are sufficient to preserve their “natural state.”<sup>126</sup> The manager will gather most necessary data, but an auditor under the FSC system is expected to verify the accuracy of the data through some degree of field sampling.<sup>127</sup> For example, an auditor may determine that certain large predators are a part of a particular ecosystem, which may then require an analysis of whether the area protected as a sample provides sufficient range for the predator. The analysis may become even more complex where a type of ecosystem exists in a degraded condition because in that case the standard does not make clear whether protecting the ecosystem in its natural state requires affirmative measures to improve the area’s condition.<sup>128</sup> However, an auditor could reasonably conclude that improvement is necessary for full compliance based on an interpretation of a separate environmental standard that states: “[e]cological functions and values shall be maintained intact, enhanced, or restored.”<sup>129</sup> Such a conclusion would then require the auditor to assess measures taken by the manager to restore the degraded ecosystem.

An audit under the SFI standard can be much simpler. First, an auditor need only determine that a program exists to protect community types (without even a clear mandate that such a

122. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.4).

123. SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (Performance Measure 4.1, Indicator 1).

124. *Id.* (Performance Measure 4.1, Indicator 5).

125. *See* FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.4).

126. *See id.*

127. FSC FOREST MANAGEMENT EVALUATION, *supra* note 65, at 2–3, 6.

128. *See* FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.4).

129. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.3).



program be scientifically sound).<sup>130</sup> Second, the auditor is not explicitly required to assess the accuracy of an inventory of community types, forest cover types, or habitats.<sup>131</sup> The auditor is only required to determine that such an inventory has been compiled. Finally, even assuming an accurate inventory, the use of such information is left firmly to the discretion of land managers. In regard to forest cover types and habitats, the determination of whether its incorporation is practical will generally be difficult to assess scientifically because practicality will be intimately tied with the manager's vision for the operation.<sup>132</sup> Further, if an auditor finds that measures are inconsistent with management goals, the standard does not prevent managers from changing their goals rather than their practices.<sup>133</sup> Thus, the SFI standard provides little role for scientific assessment of forest conditions.

Overarching differences in the role of science in the FSC and SFI auditing regimes are apparent in their standards pertaining to areas of particular environmental significance. FSC requires managers to conduct an assessment to identify "high conservation value forests," then imposes a requirement that decisions in those areas "shall always be considered in the context of a precautionary approach."<sup>134</sup> In one of its more prescriptive standards, SFI requires that managers "identify special sites and manage them in a manner appropriate for their unique features."<sup>135</sup> The difference between "precaution" in the FSC standard and "appropriate" in the SFI standard shows the difference in their approach to scientific uncertainty—FSC requires managers to err on the side of environmental sustainability, while SFI allows uncertainty to provide discretion. In the context of an audit, the FSC standard serves to give environmental sciences priority—if doubt exists as to whether management practices are harmful, they should be avoided. On the other hand, the SFI standard requires a balance of a broad array of considerations to determine what is appropriate.

130. See SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (Performance Measure 4.1, Indicator 1).

131. See *id.* (Performance Measure 4.1, Indicator 1 and Indicator 5).

132. See SFI, 2005–2009 STANDARD, *supra* note 31, at 6 (Performance Measure 4.1, Indicator 5). The meaning of "where practical and when consistent with management objectives" is not elaborated and, thus, could include various non-scientifically verifiable management considerations.

133. See *id.*

134. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 7 (Principle 9).

135. SFI, 2005–2009 STANDARD, *supra* note 31, at 7 (Performance Measure 6.1).

This limits the role science can play in determining whether the standard is satisfied in a given situation because, even if a practice may be environmentally harmful, such harm may be outweighed by another factor said to make it “appropriate.”

Environmental sustainability under SFI is largely left to the managers’ discretion, which can frequently be justified through scientific complexity and uncertainty. SFI standards require only slightly more than compliance with applicable environmental laws and consideration of environmental impacts in planning. For example, SFI’s standard on protection of water bodies requires managers to develop plans based on science and to comply with both applicable laws and best management practices developed by the EPA.<sup>136</sup>

FSC, on the other hand, reacts to uncertainty in the area of environmental sustainability with a precautionary approach. Its standards compel managers to err on the side of environmental protection when the environmental impacts of management techniques are uncertain. The most obvious example of this precautionary approach is a flat prohibition on the use of genetically modified organisms.<sup>137</sup> In the same vein, FSC sets high scientific hurdles for managers seeking to use scientifically questionable techniques. In order to employ non-native biological control agents, for example, U.S. managers must have a peer reviewed evidentiary basis for concluding the agents are non-invasive and safe for indigenous species.<sup>138</sup>

The differences apparent in the examples provided above suggest that FSC’s standards reflect the forest conditions that FSC deems necessary to secure environmental sustainability and requires scientific assessment during the audit to verify compliance. SFI, on the other hand, signals areas where scientific assessment is necessary, but leaves the choice among scientifically defensible options to managers. Thus, FSC standards appear more prescriptive and precautionary, employing science to measure compliance, whereas SFI relies on participants’ use of science to plan for environmental sustainability, allowing management

136. SFI, 2005–2009 STANDARD, *supra* note 31, at 5 (Objective 3.1).

137. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 5 (Criterion 6.8).

138. FSC, U.S. NATIONAL INDICATORS FOR FOREST STEWARDSHIP 17–18 (2001) [hereinafter FSC-U.S. NATIONAL INDICATORS] (Indicator 6.8.a), *available at* [http://www.fscus.org/images/documents/FSC\\_National\\_Indicators.pdf](http://www.fscus.org/images/documents/FSC_National_Indicators.pdf).

discretion in the face of potential uncertainty.

## 2. Social and Economic Standards

In the area of social standards, FSC clearly provides more specific direction and a greater role for science than SFI. For example, FSC criterion 4.4 requires that “[m]anagement planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups . . . directly affected by management operations.”<sup>139</sup> In the United States, the national indicators expand on this requirement, essentially requiring a notice and comment procedure for proposed management activities, with a further requirement that “[s]ignificant concerns are addressed in management policies and plans.”<sup>140</sup> FSC criterion 4.4 signals the need for social science in the auditing procedure because it requires “evaluations of social impact.”<sup>141</sup> Objectively assessing such evaluations and whether their results were adequately incorporated will generally require a social scientist.<sup>142</sup>

SFI has standards related to social concerns, but it is not clear that they are scientifically assessable. For example, participants are to “support and promote . . . mechanisms for public outreach, education, and involvement related to forest management.”<sup>143</sup> Indicators related to this standard include the provision of educational and recreational activities.<sup>144</sup> Where participants are harvesting on public lands, SFI requires that they participate in relevant public processes and confer with affected indigenous peoples.<sup>145</sup> The social standards developed by SFI do not appear to require that science play a role in either managers’ decisionmaking or audits.<sup>146</sup>

The economic standards of SFI are somewhat more fully elaborated than those of FSC. Nonetheless, the SFI standards appear to provide greater flexibility and to rely on the participant

139. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 4 (Criterion 4.4).

140. FSC-U.S. NATIONAL INDICATORS, *supra* note 138, at 7 (Indicator 4.4.c).

141. *Id.* at 7 (Criterion 4.4).

142. Social scientists are commonly a part of FSC auditing teams, as discussed in Section III.C, *infra*.

143. SFI, 2005–2009 STANDARD, *supra* note 31, at 10 (Performance Measure 12.2).

144. *Id.* at 10–11.

145. *Id.* at 11 (Performance Measures 12.3, 12.4).

146. SFI auditing teams generally do not include social scientists, *see* Section III.C, *infra*.

to incorporate science. For example, SFI requires participants to ensure “long-term harvest levels based on the use of the best scientific information available.”<sup>147</sup> An indicator under this objective is the presence of a “long-term resource analysis.”<sup>148</sup> Thus, SFI calls for participants to use background scientific information and scientific analysis, but does not set a strict harvest level requirement. An auditor will need only to assess whether the participant has planned for long-term harvest sustainability and incorporated generally accepted scientific information.

In contrast, the relevant FSC criterion simply states that “[t]he rate of harvest of forest products shall not exceed levels which can be permanently sustained.”<sup>149</sup> The FSC-U.S. national indicators specify that, generally, the rate of growth must meet or exceed the rate of harvest for a period of no more than ten years.<sup>150</sup> This prescriptive standard requires detailed data for competent assessment and suggests the need for forestry science. Other FSC economic standards suggest the need for an auditor with a professional background in economics in order to reach compliance conclusions. For example, operations are required to take into account “the full environmental, social, and operational costs of production, and ensur[e] the investments necessary to maintain the ecological productivity of the forest.”<sup>151</sup> This prescription will require fairly sophisticated economic analysis in order to verify compliance.

As with environmental standards, FSC’s approach to social and economic sustainability requires a much greater role for science in audits than SFI’s approach. FSC’s firm prescriptions require detailed data and in-depth analysis to determine whether they are satisfied. At most, SFI requires that auditors verify the existence of science-based plans created by the managers.

147. SFI, 2005–2009 STANDARD, *supra* note 31, at 4 (Objective 1). Notably, FSC’s standards pertaining to management plans require that plans or supporting documents describe the “[r]ationale for rate of annual harvest and species selection,” which suggests a need for managers to document their use of science similar to SFI’s requirements. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 6 [Criterion 7.1(d)].

148. SFI, 2005–2009 STANDARD, *supra* note 31, at 4 (Indicator 1.1).

149. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 4 (Criterion 5.6).

150. FSC-U.S. NATIONAL INDICATORS, *supra* note 138, at 10 (Indicator 5.6.b).

151. FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 4 (Criterion 5.1).

### C. Accreditation of Auditing Firms and Composition of Auditing Teams

The individuals responsible for performing audits are an essential element in determining the role that scientific methodology and knowledge will play in the actual audits. Most obviously, the level and type of scientific background auditors have will determine their ability to draw upon scientific knowledge and methodology in performing audits. This includes consideration of the disciplines represented in an audit team because different types of scientists may view and assess similar information differently. Additionally, and at least equally significant, who performs the audit is fundamentally important because decisionmaking throughout the audit requires the use of judgment.

The auditors' judgment will influence the audit in several important ways. In order to perform a competent audit within a realistic budget, auditors must make determinations about where to focus their energies. This applies not only to determining which aspects of an entity's operation to assess most carefully, but also which standards require the most attention and what various standards mean.<sup>152</sup> In addition, distilling the findings of an audit into final decisions regarding the satisfaction of particular standards and the ultimate certification decision requires the exercise of professional judgment.<sup>153</sup> The extent that science plays a role in this process (the degree of statistical analysis in reaching decisions or the amount of randomization in determining what to assess on the ground, for example) could vary as much by auditing firm as by certification system because the systems set relatively few specific requirements.<sup>154</sup> Certification systems control this variation partially through the requirements they set for auditing entities and individual auditors. Both FSC and SFI have established criteria for determining the qualification of independent auditing firms, as well as requirements for the auditing teams.

FSC accreditation is open to any entity, without any requirements for membership in particular groups.<sup>155</sup> SFI requires that firms

152. Telephone interview with Michael Ferrucci, *supra* note 45.

153. Telephone interview with Dr. Hrubes, *supra* note 16.

154. *See* section III.A, *supra*. While FSC has recently elaborated some specific requirements likely to increase uniformity and consistency across auditing firms, SFI sets virtually no such requirements.

155. Achim Droste, FSC Accreditation Process for Applicant Certification Bodies 5 (2004)

performing audits under its system be Environmental Management System registrants and accredited by the American National Standards Institute or the Standards Council of Canada.<sup>156</sup> FSC ensures that auditing entities have management systems in place similar to those required for membership in these organizations.<sup>157</sup> FSC accreditation lasts for a maximum of five years, after which the entity must apply for re-accreditation.<sup>158</sup> SFI does not specify a period during which accreditation lasts, but requires that auditors engage in some form of continuing education.<sup>159</sup>

The basic FSC requirement for auditing teams is that they have sufficient expertise to evaluate the social, economic, and environmental aspects of the forest being audited.<sup>160</sup> The most recent FSC standards for the qualifications of auditors now provide that auditing organizations must establish auditor qualifications that are at least equal to the requirements provided in ISO environmental management auditing guidelines.<sup>161</sup> Additionally, FSC requires that lead forest auditors complete a training program on the FSC system established by the auditing entity.<sup>162</sup> Further, lead auditors must have participated in at least three previous FSC audits, have a university education or five years of experience in a relevant discipline and, additionally, at least five years of professional experience in a relevant area of work.<sup>163</sup>

SFI also establishes specific requirements for members of audit teams. In particular, it requires:

at least one member of the audit team shall have knowledge of forestry operations in the region undergoing the audit, at least one member shall have knowledge of applicable laws and regulations, and

(FSC ref. code ABU-GUI-10-111), available at [http://www.fsc.org/keepout/en/content\\_areas/77/35/files/ABU\\_GUI\\_10\\_111\\_final.pdf](http://www.fsc.org/keepout/en/content_areas/77/35/files/ABU_GUI_10_111_final.pdf).

156. SFI, AUDIT PROCEDURES AND QUALIFICATIONS 2005–2009, *supra* note 75, at 23.

157. See generally, FSC, THE APPLICATION OF ISO/IEC GUIDE 65:1996 (E) BY FSC ACCREDITED CERTIFICATION BODIES (2004) (FSC ref. code FSC-STD-20-001), available at [http://www.fsc.org/keepout/en/content\\_areas/77/107/files/FSC\\_STD\\_20\\_001\\_General\\_requirements\\_for\\_FSC\\_certification\\_bodies\\_V2\\_1.PDF](http://www.fsc.org/keepout/en/content_areas/77/107/files/FSC_STD_20_001_General_requirements_for_FSC_certification_bodies_V2_1.PDF); FSC ACCREDITATION MANUAL (2002).

158. DROSTE, *supra* note 155, § 5.16, at 5.

159. SFI, AUDIT PROCEDURES AND QUALIFICATIONS 2005–2009, *supra* note 75, at 24.

160. FSC, QUALIFICATIONS FOR FSC CERTIFICATION BODY AUDITORS 3–4 (2005) (FSC ref. code FSC-STD-20-004), available at [http://www.fsc.org/keepout/en/content\\_areas/77/101/files/FSC\\_STD\\_20\\_004\\_Qualifications\\_for\\_FSC\\_certification\\_body\\_auditors\\_V2\\_2.pdf](http://www.fsc.org/keepout/en/content_areas/77/101/files/FSC_STD_20_004_Qualifications_for_FSC_certification_body_auditors_V2_2.pdf).

161. *Id.* § 1.1, at 2. Moreover, separate qualifications are established for lead chain of custody auditors. *Id.* § 1.3 *et seq.*, at 3.

162. *Id.* § 1.2.1, at 3.

163. *Id.* § 1.2.2-2.3, at 3.

at least one member shall be a professional forester as defined by the Society of American Foresters (SAF), the Canadian Institute of Forestry, or licensed or registered by the state(s) or province(s) in which the certification is conducted. For forest management audits, the audit team shall have expertise that includes plant and wildlife ecology, silviculture, forest modeling, forest operations, and hydrology.<sup>164</sup>

SFI also specifies educational and work experience requirements for its auditors, generally requiring a minimum of secondary education and five years experience or a professional degree in forestry and two years experience.<sup>165</sup>

FSC's requirement that auditing teams be competent to evaluate social, environmental, and economic aspects of forestry leads to teams with a more diverse range of disciplinary backgrounds. The interdisciplinary nature of FSC teams is the primary difference between auditing teams performing FSC audits and those performing SFI audits.<sup>166</sup> SFI auditing teams may be composed entirely of professional foresters, although they often include a biologist or ecologist. Perhaps as a result of the emphasis on foresters, SFI auditing teams tend to have greater strengths in the operational aspects of forestry (such as logger training) than FSC teams.<sup>167</sup> FSC auditing teams also include foresters as well as specialists in ecology, wildlife biology and/or social sciences. Based on the public audit reports available for SFI audits and FSC audits performed by Scientific Certification Systems (SCS),<sup>168</sup> FSC auditing teams tend to represent a greater diversity of scientific disciplines.<sup>169</sup>

Examples of SCS auditing teams illustrate the range of disciplines employed under the FSC systems. In an audit covering 101,000

164. SFI, 2005–2009 STANDARD, *supra* note 31, at 23 (2005).

165. *Id.* at 24.

166. This fact was suggested by auditors I interviewed and is reflected in the public summaries of audit reports under the two systems.

167. Telephone interview with Michael Ferrucci, *supra* note 45.

168. *See supra* note 16.

169. A comprehensive study of public audit reports was not undertaken, but all reports reviewed supported the conclusion that SFI auditors are primarily foresters and that all FSC auditing teams with more than one member include foresters plus at least one member with significant expertise in another scientific discipline. Public reports of audits performed by SCS are available at [http://www.scs-certified.com/forestry/forest\\_certclients.html](http://www.scs-certified.com/forestry/forest_certclients.html). Public reports for SFI audits are generally available through the certified entities' websites, although SFI has recently begun posting some audit reports at <http://www.aboutsf.org/auditreports.cfm>. In reviewing these documents, the discrepancy in length and detail was noteworthy. FSC summaries are much longer and provide detail on the auditing process, whereas many of the SFI public reports do little more than report the fact of certification.

privately-owned acres in Maine, the auditing team consisted of a wildlife biologist with over twenty years experience and a forester with extensive experience in SFI and FSC certification, as well as a broad range of forest management issues.<sup>170</sup> In an audit covering 235,000 privately-owned acres, the auditing team consisted of a professional forester and forest economist with over 25 years experience (and the author of SCS's FSC auditing protocols); a specialist in environmental policy, natural resource management, rural sociology and community development; a forest contractor with extensive forestry experience; a research scientist (natural history and ecology) with over 25 years experience and training as a vertebrate zoologist; and a scientist with extensive academic credentials in sustainable management and botany.<sup>171</sup> On smaller-scale projects, the teams are, not surprisingly, less diverse and may even be composed of only a single individual.<sup>172</sup> Auditing teams under the SFI may contain the same level of expertise (and perhaps even the same individuals), but the teams usually emphasize a background in forestry over other disciplines.

Recently, entities have begun seeking certification under both SFI and FSC. In response, some auditing firms now offer joint certification options, where a single audit is used to assess an operation under both systems. This highlights important similarities of the process. An auditor who has been involved in many joint certification audits stated that the field time involved is identical for both systems under the protocol he uses.<sup>173</sup> He confirmed, however, that the FSC system requires greater assessment of forest conditions and that auditing teams under FSC generally include a social scientist and someone with a strong

170. SCS, PUBLIC SUMMARY OF THE FOREST MANAGEMENT AND STUMP-TO-FOREST GATE CHAIN-OF-CUSTODY CERTIFICATION EVALUATION REPORT FOR THE BASKAHEGAN COMPANY 4, 19 (2004), *available at* [http://www.scs-certified.com/PDFS/forest\\_Baskahegan.pdf](http://www.scs-certified.com/PDFS/forest_Baskahegan.pdf).

171. SCS, PUBLIC SUMMARY CERTIFICATION REPORT ON THE EVALUATION OF MENDOCINO REDWOOD COMPANY 3, 8-10 (2000), *available at* [http://www.scs-certified.com/PDFS/forest\\_mendocinoredwood.pdf](http://www.scs-certified.com/PDFS/forest_mendocinoredwood.pdf). It is worth noting that four of the team members have Ph.D. level educations.

172. *E.g.*, SCS, PUBLIC SUMMARY OF THE FOREST MANAGEMENT AND STUMP-TO-FOREST GATE CHAIN-OF-CUSTODY CERTIFICATION EVALUATION REPORT FOR THE FORT BIDWELL INDIAN RESERVATION 4, 7 (2004), *available at* [http://www.scs-certified.com/PDFS/forest\\_FortBidwellPS.pdf](http://www.scs-certified.com/PDFS/forest_FortBidwellPS.pdf), in which a single forester with extensive involvement in FSC audited 3,244 acres.

173. Telephone interview with Michael Ferrucci, *supra* note 45.



background in ecology, neither of which are required under SFI.<sup>174</sup>

The regular inclusion of ecologists and social scientists on FSC audit teams reinforces the conclusion that FSC mandates scientific assessment of forest conditions in auditing for environmental sustainability and employs scientific assessment to measure social and economic sustainability. SFI's program concentrates on managers' planning and, therefore, greater reliance on auditors with forestry backgrounds is appropriate. This suggests that FSC both demands more rigorous assessment of management impact and embraces a broader role for science in measuring different types of impact. Overall, the differences in FSC and SFI auditing team composition further suggests that the differences in procedural requirements and standards discussed above translate to significant differences in the type of science employed and the depth of scientific assessment during audits under the two systems.

The auditing experience under these two certification systems provides a background against which we can consider the strengths and weaknesses of the system recently constructed by USFS. Although USFS occupies a different position than certification regimes, the auditing under those regimes may provide the most appropriate parallel to the auditing that is required under the new USFS approach. In particular, the experience with using science in certification audits can shape our understanding of how science may be used under the new USFS regime.

#### IV. THE ROLE OF SCIENCE IN THE AUDITING FRAMEWORK ESTABLISHED BY USFS

The adaptive management approach adopted by USFS calls for a greatly increased role for auditing, inviting a comparison of this auditing with certification auditing. Auditing under the USFS system is described primarily as "evaluation," but also includes what the regulations describe as "monitoring." The regulations and directives describe USFS auditing in enough detail to allow a consideration of the role science will play.

##### A. Overview of Monitoring and Evaluation Regulations

USFS's adaptive management approach is said to "prioritize[]

174. *Id.*

agency resources to monitoring.”<sup>175</sup> Monitoring is described as a “central element of adaptive management planning . . . because monitoring is the key to discovering how to make project specific decisions consistent with objectives and to discovering what ultimately may need to be changed in a plan.”<sup>176</sup>

The 2005 rule explicitly requires development of monitoring programs in the planning process for particular national forests.<sup>177</sup> These monitoring programs can be changed without amending management plans.<sup>178</sup> The monitoring program for each national forest is to be established through a process that involves public participation and gives attention to the following considerations: “(i) Financial and technical capabilities; (ii) Key social, economic, and ecological performance measures relevant to the plan area; and (iii) The best available science.”<sup>179</sup> The program must establish monitoring to assess “whether plan implementation is achieving multiple use objectives,” “the effects of the various resource management activities within the plan area on the productivity of the land,” and “the degree to which on-the-ground management is maintaining or making progress toward the desired conditions and objectives for the plan.”<sup>180</sup>

The 2005 rule establishes three types of required evaluations: comprehensive evaluations at least every five years, annual evaluations, and evaluations whenever there is a plan amendment.<sup>181</sup> All evaluations will culminate in a public report.<sup>182</sup> For comprehensive evaluations, the report must describe the “area of analysis” and describe the social, economic, and ecological conditions and trends, including a discussion of changes since the previous evaluation.<sup>183</sup> The discussion of conditions and trends must be “based on available information, including monitoring information, surveys, assessments, analyses, and other studies as

175. *USFS Rule*, *supra* note 48, at 1024.

176. *Id.* at 1027.

177. 36 C.F.R. §219.6(b) (2005).

178. *Id.* The reason for the ease of changing the program is “to more quickly reflect the best available science and account for unanticipated changes in condition.” *USFS Rule*, *supra* note 48, at 1027.

179. *Id.* § 219.6(b)(1).

180. *Id.* § 219.6(b)(2)(i)–(iii).

181. *Id.* § 219.6(a). Notably, the first two correspond with requirements under both FSC and SFI for re-certification every five years and surveillance audits in the interim.

182. *Id.*

183. *Id.* § 219.6(a)(1).

appropriate.”<sup>184</sup> Annual evaluations are based on the monitoring required by the regulations.<sup>185</sup> Evaluations for a plan amendment analyze the issues relevant to the amendment and may be based on information in comprehensive evaluations.<sup>186</sup>

### B. Science in USFS Auditing

The 2005 rule emphasizes the importance of basing decisions on science. The preamble asserts that “[p]rotection and management of the [national forests] should be based on sound science, which is fundamental to this final rule.”<sup>187</sup> However, whereas the 2002 proposed rule would have required that decisions be consistent with the best available science, the 2005 rule only requires that the best available science be considered.<sup>188</sup> The rule does require that decisionmaking officials document their consideration of the best available science and affirm that it was “appropriately interpreted and applied.”<sup>189</sup> The official must “evaluate and disclose substantial uncertainties” in the science evaluated and “risks associated with plan components based on [the best available] science.”<sup>190</sup> The method used “to evaluate the consideration of science in the planning process” is left open, though peer review and a science advisory board are listed as options.<sup>191</sup>

Science can play an important role in the USFS audits along the same lines as it does in certification audits. In particular, the protocols established by USFS will greatly impact the role that science plays. Standards in the form of desired conditions, objectives and guidelines in management plans (including considerations of their auditability) may also affect the shape of USFS audits.<sup>192</sup>

184. *Id.* § 219.6(a)(1)(ii).

185. *Id.* §§ 219.6(a)(3), (b)(2).

186. *Id.* § 219.6(a)(2).

187. *USFS Rule, supra* note 48, at 1024.

188. *Id.* at 1027.

189. 36 C.F.R. §§ 219.11(a)(1), (4) (2005).

190. *Id.* §§ 219.11(a)(2), (3).

191. *Id.* § 219.11(b).

192. It is not clear whether audits will be shaped by standards, but because their purpose is to measure impacts it appears likely that assessment against standards will be a part of the system. *See* 36 C.F.R. § 219.6(b)(2) (2005). It is also worth noting that at least one commentator has suggested that the personnel involved in designing audits will be important to how science is used under the new rule. Jeffrey Rudd, *The Forest Service's Epistemic Judgments: Enhancing Transparency to Ensure "New Knowledge" Informs Agency*

### 1. Auditing Procedure

Several interim directives related to monitoring and evaluation requirements have been developed under the 2005 planning rule.<sup>193</sup> These interim directives have begun to sketch a picture of what forest auditing will look like under the new regulations.

The procedure for conducting audits under the USFS system depends primarily upon direct data collection by USFS, unlike the certification auditing regimes.<sup>194</sup> The primary approach to evaluating environmental sustainability focuses on ecological diversity, which is to be judged against a baseline of historical variation.<sup>195</sup> This is a change from USFS's previous species-centered approach.<sup>196</sup> The first step in evaluating ecological diversity under the USFS system is a determination of the level of rigor required based on a preliminary assessment.<sup>197</sup> The rigor of the audit is supposed to turn on the level of risk to ecosystems and species, especially as affected by current and proposed management actions, complexity, uncertainty, and cost.<sup>198</sup> Ecosystem diversity is to be assessed based on data concerning composition, structure and processes of "the biological and physical resources in the plan area."<sup>199</sup> The dataset described in the directives appears complex and in-depth, including, for example, detailed descriptions of the diversity and distribution of species.<sup>200</sup> The directives call for a "range of variation" approach to analyzing this data in most cases.<sup>201</sup>

*Decisionmaking Processes*, 23 TEMP. ENVTL. L. & TECH. J. 145, 207 (2004) (arguing that the agency should consult non-agency scientists in order to best determine what scientific methods should be used).

193. The directives relevant to the *USFS Rule* are available at <http://www.fs.fed.us/emc/nfma/index5.html>.

194. See generally, USFS, FOREST SERVICE HANDBOOK, SCIENCE AND SUSTAINABILITY, *Interim Directive No. 1909.12-2005-05* (March 4, 2005) [hereinafter *Sustainability Directive*], available at [http://www.fs.fed.us/emc/nfma/includes/directives/id\\_fsh\\_chapter\\_40\\_sustainability.pdf](http://www.fs.fed.us/emc/nfma/includes/directives/id_fsh_chapter_40_sustainability.pdf). Currently, the directive only addresses sustainability. The section on science is reserved.

195. *Id.* at 11–12.

196. See USFS, FOREST SERVICE MANUAL, LAND MANAGEMENT PLANNING, *Interim Directive No. 1920-2005-2*, at 59 (March 4, 2005) [hereinafter *Land Management Directive*], available at [http://www.fs.fed.us/emc/nfma/includes/directives/id\\_fsm\\_1920\\_land\\_management\\_planning.pdf](http://www.fs.fed.us/emc/nfma/includes/directives/id_fsm_1920_land_management_planning.pdf).

197. *Id.* at 59–60.

198. *Id.*

199. *Id.* at 61; *Sustainability Directive*, *supra* note 194, at 14–15.

200. *Sustainability Directive*, *supra* note 194, at 14.

201. *E.g.*, *id.* at 16–17. The directive notes that other approaches may be appropriate where there is too little information to apply the range of variation analysis. *Id.* at 17.

This analysis requires a reference period, which will generally begin prior to European settlement in the area, and an estimate of disturbances to various ecosystem characteristics over that period.<sup>202</sup>

In addition, the directive provides for analysis of current conditions of various ecosystem characteristics and disturbance regimes, the status of ecosystem diversity, and current risks, which should be described in a manner useful for development of plan goals.<sup>203</sup> It also requires in-depth data collection and analysis of species diversity to inform plan goals.<sup>204</sup>

The directives provide less detailed guidance on social and economic evaluation. The basic approach is to be one that identifies and describes the issues relevant to various facets of social and economic sustainability.<sup>205</sup> Such evaluation includes working with interested people to analyze relevant issues, such as the uses, products and ecological services provided by the management area.<sup>206</sup> Ultimately, the evaluation will culminate in an analysis of the past, present and projected conditions and trends in the area.<sup>207</sup>

The USFS directives establish a firmly scientific approach to auditing that is potentially a very powerful tool for designing sustainability goals and measuring management success in meeting them. As conceived, it requires significantly greater data collection and more in-depth analysis than either of the certification auditing regimes. If USFS audits were used to create mandatory sustainability goals with which all management decisions complied, the system would have an excellent chance of achieving sustainable management. Whether this approach will actually contribute to sustainable management of national forests, however, turns entirely on how the information and advice generated during audits feeds into the development of plan goals and actual management decisions.

## 2. Sustainability Standards in Auditing

It is not clear whether the USFS monitoring and evaluation will

202. *Id.* at 16–17.

203. *Id.* at 18–20.

204. *Id.* at 21–29. The focus is primarily on “species-of-concern” and “species-of-interest,” which describe species that are not federally listed as threatened or endangered, but nonetheless face significant risks.

205. *Id.* at 6.

206. *Id.* at 7–8.

207. *Id.* at 9–10.

involve auditing to particular standards in the way that the certification audits do. Auditing is intended to provide information about the extent to which management meets standards set in management plans, however, so these standards should play a role in shaping the audits.<sup>208</sup> Further, the adaptive management approach contemplates that information gained through assessment of forest conditions will inform the development and modification of standards in management plans.<sup>209</sup>

The USFS approach to environmental standards focuses on two elements: ecological diversity and species diversity.<sup>210</sup> The basic approach is to conduct an evaluation (as described above) in order to provide a basis for the development of management standards in the form of desired conditions, objectives, and guidelines.<sup>211</sup> Although specific examples cannot be identified at this time, the framework established by the regulations states that “[t]he overall goal . . . is to provide a framework to contribute to sustaining native ecological systems by providing ecological conditions to support diversity of native plant and animal species in the plan area.”<sup>212</sup> In a sense, this regulatory requirement can be understood as the equivalent of a principle under the certification regimes, the specific applications of which will be devised at the management unit level.

The USFS approach to social and economic standards emphasizes “sustaining social and economic systems within the plan area.”<sup>213</sup> In order to achieve this, the regulations require assessment of the social and economic conditions and trends in the plan area related to the forest.<sup>214</sup> This approach will likely include sociological and economic analysis, which demonstrates a greater incorporation of science into the process of auditing for these aspects of

208. See *Land Management Directive*, *supra* note 196, at 55–56; see also 36 C.F.R. § 219.6(b)(2)(iii).

209. See, e.g., 36 C.F.R. § 219.6(a) (“The overall aim of planning is to produce responsible land management for the National Forest System based on useful and current information and guidance”). The use of information gained during the audit process to inform standards is, of course, very different from certification, where standards do not develop in response to auditing information. Indeed, this is a potential strength of the USFS system.

210. 36 C.F.R. § 219.10(b) (2005); *Sustainability Directive*, *supra* note 194, at 11–27. This approach is geared toward meeting USFS’s statutory obligations. See § 219.10(b).

211. *Sustainability Directive*, *supra* note 194, at 11–27.

212. 36 C.F.R. § 219.10(b).

213. *Id.* § 219.10(a).

214. *Id.*

sustainability than required under the SFI system.<sup>215</sup>

A detailed analysis of the relationship of standards to auditing under the USFS system cannot be carried out at this time because standards under the new approach have not yet been developed. Nonetheless, the framework established by the regulations makes clear that management decisionmaking need not comply with the standards,<sup>216</sup> which leads to the conclusion that USFS standards will have significantly less impact on actual management practices than they do under the certification systems. Even if compliance is scientifically assessed, planning decisions need not conform to the conclusions.<sup>217</sup> For this reason, standards developed under the USFS are not likely to have a significant impact on the role of science. Although USFS has created a firmly scientific auditing procedure, the effect of this procedure can be drastically undermined by the profound flexibility provided to managers through the non-mandatory nature of the USFS standards.

## V. LESSONS DRAWN FROM CERTIFICATION AUDITING AND APPLICATION TO THE USFS FRAMEWORK

### A. Science in FSC and SFI Audits

The differences in the role that science plays in auditing under the FSC and SFI systems can be summarized simply. FSC ensures a more complete incorporation of scientific principles in assuring the sustainability of certified forests. This is most apparent in the strong emphasis FSC places on assessment of forest conditions, which requires direct observation of sample forest areas selected through a specific, objective procedure. Under all of its standards, FSC's explicit requirement for a sufficient sample of auditor-collected data provides a means of verifying the accuracy of data and conclusions presented by the auditee. SFI's system requires very little assessment of forest conditions and turns, by and large, on the auditee's own goals for sustainability and assessment of its

215. See, e.g., *Sustainability Directive*, *supra* note 194, at 6 (discussing the development of technical guidance for use of social sciences in social and economic evaluation).

216. See generally *USFS Rule*, *supra* note 48, at 1023–1027, which is discussed in section I.B above.

217. This follows from both the flexibility noted in section I.B above and the express disavowal of any firm requirement that decisions be consistent with the best available science noted in the *USFS Rule*, *supra* note 48, at 1027.

progress. In this way, SFI is much more flexible and, therefore, provides a much less consistent guarantee that a forest has been objectively assessed against a uniform standard for sustainability.

The role of science in auditing under the two certification systems correlates with their different origins and affiliations. FSC, as an NGO-driven body created to increase sustainable management of forests globally, places a heavy emphasis on assessment to ensure that forest conditions meet pre-established standards for sustainability derived from stakeholder processes. SFI, developed as an industry response to FSC in the United States, imposes much less constraint on management options by requiring simply that they incorporate science in planning.

For FSC, science serves as a tool to verify on-the-ground compliance with a pre-established vision of sustainability. Although it is severely restrained by the need to encourage voluntary participation in the system and the significance of cost in this equation, it appears that FSC seeks to use science as a vehicle to impose its vision on land managers. In order to be certified, managers must demonstrate that indicators of natural forest sustainability (as defined by FSC) have been achieved on the ground.<sup>218</sup>

In stark contrast, science under SFI's system acts as a shield to deflect criticism that it does too little to ensure sustainability.<sup>219</sup> SFI focuses almost exclusively on participants' use of science for management planning, but without any clear requirement for auditors to assess the validity of managers' data or methodology.<sup>220</sup>

218. FSC now certifies plantations as well, *see* FSC PRINCIPLES AND CRITERIA, *supra* note 17, at 9 (Principle 10), but most of the focus in certification is on natural forests.

219. In competing with FSC, SFI's primary obstacle has been criticism by the environmental community that it does not sufficiently ensure sustainable management. *See* Section I.A.2, *supra*. Changes in the SFI program that increased the use of science in SFI auditing and provided increased objectivity, such as third party auditing, appear to have been responses to these criticisms. CASHORE, *supra* note 16, at 9–10. This was reflected, for example, in letters between Michael Brune of the Rainforest Alliance Network and William H. Banzhaf and Colin Moseley of the Sustainable Forestry Board in 2003. The initial letter is available at <http://www.dontbuysfi.com/letter/>, subsequent letters were previously available on SFB's website prior to its reconstruction and may soon be available on the reconstructed site.

220. This is not to say that FSC does not require an equally high level of scientific planning by managers, just that it does not rely on that planning as an indicator of sustainability to the extent that SFI does. For examples of FSC requirements for scientific planning, *see* Indicators 6.1 (requiring environmental assessments) and 7.2 (requiring updating of management plans based on monitoring data or new scientific information).



SFI seeks to achieve the legitimacy and credibility associated with objective scientific assessment by basing its certification on the incorporation of science in planning. Thereby, SFI requires only a very limited role for science in auditing and places a smaller burden on managers seeking certification than FSC auditing.

Whether or not one agrees that FSC's standards supply an accurate yardstick for sustainability, the FSC system must be adjudged to more fully incorporate scientific principles into audits. FSC sets explicit on-the-ground measures of sustainability in the standards, establishes a uniform sampling methodology, requires verification of auditee-collected data, and demands scientifically credible reporting. These factors show that the role of science in FSC auditing is to ensure that certified products verifiably conform to FSC standards. An SFI-certified product, on the other hand, can only be said to come from a forest where managers have established programs that are intended to lead to their own vision of sustainability.

#### B. Lessons for USFS

The USFS framework for auditing is designed to rigorously assess forest conditions, but it does not establish any firm requirements for sustainability. This unusual combination may serve to provide the appearance of an auditing process firmly grounded in science without providing that process with the ability to influence management decisions. Concerns that the new regulations will allow much greater harvesting may be well-founded. There is nothing in the regulations to prevent this. If USFS seeks to establish a system that provides the same level of assurance as FSC certification, the focus must be on producing sound standards and ensuring strict compliance with them. The current auditing design is well suited to facilitating such an approach.

It is not clear whether USFS will soundly base its standards on science. Because an agency official has final authority over plans and must report his consideration of science,<sup>221</sup> one hopes that scientific considerations will thoroughly influence the vision of sustainable management that emerges in the forthcoming

221. Note that USFS consciously allowed decisionmakers to deviate from conclusions suggested by science by requiring only that officials "take into account the best available science," rather than "be consistent with" such science as the 2002 proposed rule would have required. 36 C.F.R. § 219.11 (2005); *USFS Rule*, *supra* note 48, at 1027.

management plans, but there are no guarantees. In this regard, the regulations create a system at least as flexible as SFI's. Every planning unit can create its own vision of sustainability.

Even with the best desired conditions, objectives, and guidelines in place in a management plan, the non-mandatory character of these USFS standards permits actual management activities to fall far short of them without consequence. Scientific uncertainty could be used by USFS to justify decisions inconsistent with indicators of sustainability that are established at higher levels in the planning process. In fact, decisions could deviate from standards even when science suggests conformance is appropriate.<sup>222</sup> This absence of firm requirements for forest conditions follows the flexible SFI approach. Neither system provides a firm guarantee that actual management conforms to a vision of sustainability.

If USFS wants to create a system that uses auditing to create sustainable management, two key changes are needed. First, officials should be required, under most circumstances, to follow the recommendations contained in evaluations when adopting standards in management plans. Second, at least some of the standards created in the plans must express firm requirements rather than optional guidelines. Even in the absence of regulatory changes, officials should embrace these two recommendations as guides to decisionmaking.

If USFS adopts an approach that seriously seeks to implement standards for sustainability that are designed with careful attention to science, it will be a promising system. The USFS auditing procedures may prove both more extensive and more scientific than either certification system. As described in the directives, the procedures appear carefully crafted to provide a detailed and accurate guide for sustainable management. Ultimately, however, the test of this system will not be its scientifically-based auditing procedure, but whether officials choose to implement the information produced by auditing with a genuine desire to achieve sustainable management.

USFS, as a regulatory agency, is clearly in a different position than FSC or SFI. USFS actually manages large forest areas and can be sued for failing to follow its own regulations. One avenue for seeking greater guarantees of sustainable management would be to

222. See 36 C.F.R. § 219.11.

require that national forests be certified by FSC or SFI, as some state forests have been. However, mandating certification would subordinate USFS decisionmaking to the certifiers' requirements because USFS could be compelled to follow certifiers' recommendations as a means of meeting the mandate in their regulations. Thus, the USFS solution to auditing for sustainable forestry should be located within the agency itself. USFS can and should learn from certification auditing, however. In particular, it should incorporate a greater degree of mandatory standards based on forest conditions, as FSC does.

Mandatory condition-based standards can be incorporated into the adaptive management framework by retaining local power to establish specific standards, revisable on a periodic basis, with which all management decisionmaking must comply, as well as long-term aspirational goals. The detailed auditing procedure established by USFS should then produce a set of recommendations for meeting locally-established sustainability standards and goals, which should control decisionmaking in all but the most extraordinary circumstances. To ensure compliance, the agency should be legally accountable when managers deviate from the standards and recommendations, thereby providing citizens with the power to enforce the sustainability mandate.

In summary, USFS can learn from FSC and SFI in order to incorporate the best of each system. In line with USFS's adaptive management approach, it may make sense to allow a degree of flexibility in defining sustainability, as SFI does. However, this flexibility should come in a public process that establishes goals and standards for forest management. Once goals are established, they should be translated into fairly precise measures of forest conditions that will indicate whether progress toward the goals is being achieved. Audits, using the full panoply of scientific tools described in current guidance, should culminate in mandatory guidelines designed to ensure that particular management decisions further the goals established in management plans. In other words, auditing should be used to restrain discretion on particular decisions by measuring the impact of past decisions, predicting the range of acceptable future decisions, and providing decisionmakers with clear direction for achieving stated goals. Such audit-based guidelines would provide a litigation-hook for citizens concerned that managers are giving too little attention to

sustainability goals, but would not unduly tie USFS's hands in the face of outside certifiers' recommendations or restrict the agency through inflexible national standards.

## VI. CONCLUSION

For the consumer seeking to purchase forest products from a well-managed source, FSC certification provides the greatest guarantee that an operation's management is sustainable. This is because FSC employs a consistent definition of sustainability and the greatest level of detail in standards concerning actual conditions in the forest, as well as an auditing methodology that emphasizes verification of data and application of scientific principles from multiple disciplines. The SFI system provides a framework for sustainability, but the variation in terms of how operations implement this system can be broad. Many forest managers are likely to find SFI certification easier to achieve for this reason—they maintain greater discretion over how to plan for sustainability. This provides little assurance for consumers, however.

The USFS approach incorporates elements of both certification systems' approach to auditing. It holds promise, but the opportunities for failure are also great. Its requirements for verification of forest conditions will, perhaps even more than FSC's audits, provide a detailed measurement of whether management has been sustainable. However, the USFS system contains a profound and overriding potential for officials to disregard this assessment because management decisions need not follow established goals or scientific advice.

The keys to success under the USFS regime will be creation of a strong and measurable vision of sustainability in the management plan and decisionmaking that uses the data gathered from evaluations and monitoring to ensure compliance with that vision. Transforming the audit's role from one of isolated information collection to one that produces mandatory guidelines on a range of acceptable decisions that will lead to progress toward management goals would make the USFS system an adaptable, credible and promising avenue to sustainable forestry.