

AN ABSTRACT OF THE THESIS OF

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This study compares the requirements of three forest certification systems, the Sustainable Forestry Institute (SFI), the Forest Stewardship Council (FSC), and the International Organization for Standardization (ISO), with the 2005 McDonald-Dunn Forest Plan Revision. The analysis was done with a series of matrices comparing the requirements of SFI and FSC with the content of the McDonald-Dunn plan. ISO, which lacks specific requirements, was not included in the matrices. The McDonald-Dunn plan generally satisfies the SFI standard with the exception of the absence of specific written plans. Achieving FSC certification would require more substantive changes to McDonald-Dunn management practices. Specifically, FSC requirements that would be problematic for McDonald-Dunn managers include chemical use reduction, prohibition of genetically modified organisms, maintenance of ecological functions and the limitation of plantations. ISO is a flexible system in which the managers create their own standards and means of monitoring compliance. The McDonald-Dunn plan already contains these elements. Although SFI and FSC certification would provide an external review of management and teaching and research opportunities about certification, it would limit other research, be expensive, and restrict the outreach ability of the forest regarding industrial forestry practices. The more flexible ISO approach is most compatible with the McDonald-Dunn plan.

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A Comparison of Three Certification Systems with the 2005 McDonald-Dunn Forest

Plan Revision

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A Comparison of Three Certification Systems with the 2005 McDonald-Dunn Forest Plan Revision

INTRODUCTION

The purpose of this study is to compare three forest certification systems, the Sustainable Forestry Initiative (SFI), the Forest Stewardship Council (FSC) and the International Organization of Standards (ISO) Environmental Management System (EMS) with the 2005 McDonald-Dunn Forest Plan. For each system a brief history and introduction is given. Then a discussion follows for each system of the areas that are compatible with the McDonald-Dunn Forest Plan and those areas where the plan does not satisfy the requirements. The scope of this project is intended to be similar to that of a pre-assessment for seeking certification. It points out areas that should be addressed before considering certification but does not attempt to evaluate compliance with specific requirements of the systems.

Certification History in the USA

In the late 1980's and early 1990's there were many concerns about the future of the world's forests. People saw many threats to forests such as the conversion of forest land to agriculture and unsustainable harvest levels and pollution, among many other issues. Public concern was growing about the sustainability of forest practices (Fletcher 2005). This concern was evident at the 1992 Earth Summit in Rio. It was the discussion of these issues and the lack of a resolution to them that were the catalysts for creating forest certification systems. The Forest Stewardship Council (FSC) was formed in 1993 in order to address the question of what makes a forest sustainable (Washburn and Miller

2003, p. 8). The Sustainable Forestry Initiative (SFI) followed shortly after in 1995 (Wallinger 2003, p. 9).

It is important to note that FSC and SFI were not the first certification systems. There were other standards which preceded them such as the Rogue Institute and Scientific Certification Systems. The principles of these early groups influenced the development of FSC (Fletcher 2005). Although they were not the first, SFI and FSC are now among the most popular systems in the United States. The original focus of the certification movement was on preventing the destruction of tropical forests. However, it has grown in to a worldwide initiative. It is actually more popular in temperate regions than the tropical regions it was intended to protect (Fletcher 2005).

Creating a market premium for certified wood or making certification a condition for operating in a market was the original incentive for landowners to become certified (Laband 2004 p.21). While some argue that this has happened, it has yet to be proven on a broad scale that would be applicable to industrial forestry as a whole.

The McDonald-Dunn Forest

The McDonald-Dunn forest is approximately 11,250 acres in size and serves as the main teaching and research laboratory for the Oregon State University College of Forestry. Revenue generated by the forest is used to support the teaching, research and outreach activities of the College of Forestry.

The current draft of the management plan is a revision of the existing management plan. It is intended to be in place for the next ten years, at which time another revision will occur. This plan was written by an interdisciplinary team composed of OSU faculty, McDonald-Dunn' staff and interested outside parties, under the direction of the Forestry

Executive Committee in the College of Forestry. Public input was sought and incorporated into the plans at all stages. The plan is meant as a guide for management activities. Specific prescriptions and policies will be developed by staff as they implement the plan. The plan was structured around seven goals:

1. Provide diverse opportunities for learning, discovery and dissemination of new knowledge.
2. Optimize net revenue to support education, research, and outreach in the College of Forestry.
3. Sustain forest ecosystems
4. Identify, protect, and perpetuate cultural heritage sites
5. Provide safe, quality recreation opportunities
6. Establish, maintain, and enhance good relationships with neighbors
7. Demonstrate a commitment to continuous improvement

A notable new feature of this plan is the focus on developing an adaptive management system. This will require monitoring and evaluating the effectiveness of the plan. There is a commitment in the plan to an annual internal review and a third party review every five years. Areas that are lacking in performance will be identified and addressed immediately. The 2005 revision kept the three geographic zones of the forest which were defined in the 1993 plan. In addition to the three geographic zones, four landscape-scale management themes were adopted. Theme 1 is short rotation wood production with high return on investment. Theme 2 is high quality, growth maximizing timber production. Theme 3 is visually sensitive, even-age forest. Theme 4 is structurally diverse forest. In addition to these themes there are several special areas and projects identified:

- Old growth reserve areas have been retained
- Nesting, roosting, and foraging habitat for northern spotted owls will be maintained
- Oak savannas, prairies, and woodlands will be evaluated and restoration projects implemented

- An invasive species control and containment program will be developed with a major focus on false-brome
- A hardwood analysis and management strategy will be developed
- Snags and down wood will become the focus of an extensive research program
- A research program will investigate options for managing riparian zones

The plan also includes a Memorandum of Agreement between the College of Forestry and the Confederated Tribes of the Grand Ronde (Fletcher, et al. 2005 p. 51). This agreement will improve the management of the many cultural resources found on the forest.

SUSTAINABLE FORESTRY INITIATIVE

Introduction

As with all certification systems, the SFI system outlines standards by which any interested party can judge the quality of management. The participants in the program must be committed to practicing sustainable forestry and be involved in promoting the practices to all forest landowners. Responsibility to the forestry profession and to educating society as a whole is stressed in the SFI standard (Sustainable Forestry Board 2004 p.9). This standard has been widely adopted by industrial forest owners, as well as many other types of forest owners and managers.

History

The SFI standard began in 1990 as the result of the efforts of the American Forests Council, working on the behalf of the American Paper Institute (API) and the National Forest Products Association (NFPA), during a conference on the future of forestry. This conference led to the adoption of ten management principles in 1992. API and NFPA merged to create the American Forest and Paper Association (AF&PA) which in 1994 began the process that lead to the creation of the SFI Principles and Implementation Guidelines. Then, in 1995 in order to gain feedback and review of the standards, the External Review Panel (ERP) was created to provide a formal process for stakeholder review. An industry standard was created in 1998. In addition, during that year three options for verification were introduced: first-, second-, and third-party. In order to address concerns of effectiveness, consistency, and credibility, the Sustainable Forestry Board (SFB) was created in 2000 to manage the SFI Standard. In 2001 the SFB

was made an independent entity with full authority over the standard and verification of compliance (Wallinger 2003, p. 9, 16). All members of AF&PA are required to abide by the SFI standard.

Content

The 2005-2009 SFI standards consist of thirteen objectives. Seven objectives address land management, one objective is specific to program participants who are involved in procuring wood and fiber, one deals with research, science and technology, one with training and education, one with legal and regulatory compliance, one with the public and landowner involvement in the practice of sustainable forestry, and one with management review and continual improvement. Each objective has a series of Performance Measures. Each Performance Measure has a series of Core Indicators and Other Indicators (Sustainable Forestry Board 2004 pp. 4-11).

There is considerable emphasis on research and education in the standards for SFI. Participants are required to conduct their own research and/or support entities that conduct or fund research (Sustainable Forestry Board 2004, p. 9). There are also requirements in the standards for educating employees, the public and other members of the forestry sector about sustainable forestry (Sustainable Forestry Board 2004, p. 9). Documentation of policies and procedures is required in the SFI standard. Due to its creation by an industry, the focus is on practicing industrial forestry in a responsible manner. It is about getting financial returns while ensuring the environment is not sacrificed.

FOREST STEWARDSHIP COUNCIL

Introduction

The Forest Stewardship Council's mission is to promote forest management that is environmentally, socially, and economically sound. This involves harvesting timber and non-timber forest products in a way that maintains the ecological integrity of the forest, managing forests in a way that is beneficial to people directly and indirectly affected by forest management activities, and planning operations in a way that are profitable but not at the expense of the ecological integrity of the forest (Washburn and Miller 2003, p.8). FSC was created to change the way people talk about and practice forestry. The reach of FSC is worldwide. They have principles and criteria which are universally applied. In the United States these standards have been supplemented through specific regional standards, one of which is the Pacific Coast standard. FSC claims to be the first comprehensive forest certification system after which all others have been created to compete with or to emulate (Washburn and Miller 2003, p.13). FSC is a non-profit organization that sets standards for sustainable forestry. They do not supply certification auditing. Instead they rely on independent, for-profit certifiers who are accredited by FSC (FSC-US website 2005).

FSC is a membership organization. The members are divided in to three chambers: economic, social, and environmental. Members vote on the board of directors and on decisions made by FSC. Due to the power members hold, there are strict statutes to insure members are committed to FSC principles (FSC-US website 2005).

History

According to Washburn and Miller, FSC was born out of the failure of the 1992 Earth Summit in Rio to describe what sustainable forestry is. In an attempt to answer this question, “loggers, foresters, environmentalists and sociologists came together in 1993 to form the Forest Stewardship Council (FSC)” (2003, p.8). At that time they established the organization’s mission. The group then developed FSC’s ten forest management principles. The original focus of FSC was on tropical forests, but it has since grown to a worldwide effort to promote sustainable management of forests (Washburn and Miller 2003, p.10). However, the majority of acres currently certified are in temperate regions (Fletcher 2005).

The Pacific Coast Standard was developed starting in 1995 by a working group that contained FSC members from Washington, Oregon and California. The members represented economic, social, and environmental interests. Membership in the working group was limited to those who are members of FSC. However, there were opportunities for public review and consultations with government agencies and non-member forest management companies (FSC Pacific Coast Working Group 2002, p.7). The standard took six and one half years to develop. The working group considered current regulations on forestry and consulted many experts in the region. The final draft of the standard was sent to FSC for approval in August 2002 (FSC Pacific Coast Working Group 2002, p.8).

Content

The FSC Pacific Coast Regional Forest Stewardship Standard Version 7.9 consists of ten principles. The principles are: 1)compliance with laws and FSC principles; 2)tenure and use rights and responsibilities; 3)indigenous peoples’ rights; 4)community relations

and workers' rights; 5) benefits from the forest; 6) environmental impact; 7) management plan; 8) monitoring and assessment; 9) high conservation value forests; and 10) plantations. Each principle has several criteria which describe acceptable management practices related to that principle (FSC Pacific Coast Working Group 2002, pp.11-41).

The focus of FSC is on moving the forest away from a resource to be exploited for human use and looks more at "restoring" the forest to a more "natural" state. This standard looks at things somewhat differently than SFI because it is more about protecting the environment without forgoing financial gain.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION – ENVIRONMENTAL MANAGEMENT SYSTEM

The International Organization for Standardization (ISO) develops voluntary technical standards for almost every sector of business, industry and technology. ISO began in 1947. Most of their standards are very specific. However, the ISO 14000 family of standards is generic (ISO website 2005). In 1993 ISO established technical committee 207 (ISO-TC 207) titled Environmental Management. In 1996 TC 207 developed ISO 14001 and 14004 which describe the requirements of an Environmental Management System (EMS) and gives guidance for the use of an EMS. The committee has since come out with ISO 14001:2004 and ISO 14004:2004. These standards are known as the ISO 14000 family (ISO website 2005).

An EMS is an alternative to a certification system with predetermined standards. ISO provides a model to follow when creating and using a management system. It is important to note that ISO 14000 is concerned with processes, not outcomes. It is not a product standard. There is no “ISO Label” that can be displayed on a product. If an organization chooses to be certified, any logo would come from the certifying body, not ISO. The ISO provides a structure under which an organization can create and monitor an EMS. The ISO standard 14001:2004 is used to specify what must be in an EMS as well as serving as an auditing tool (Jackson 2005). Jackson lists the elements that the ISO 14001 standard requires to be included in an EMS:

- Establishing an environmental policy
- Establishing environmental objectives and targets and implementing plans for meeting these.
- Evaluating environmental aspects and impacts
- Identifying regulatory requirements and evaluating compliance with requirements
- Defining roles and responsibilities

- Identifying and providing necessary training
- Communicating effectively
- Documenting processes that affect environmental impacts
- Controlling parameters that affect environmental impacts
- Evaluating which suppliers' goods and services affect environmental impacts
- Preparing for emergency situations
- Monitoring and measuring critical environmental parameters
- Initiating corrective actions when problems occur
- Maintaining environmental records
- Auditing the EMS
- Evaluating and reviewing the EMS to ensure it is effective, suitable, and adequate for your organization.

When an organization chooses to implement an EMS they write standards to fit their situation. The process begins by identifying environmental aspects and impacts of the organization. Environmental aspects are ways in which the organization's activities interact with the environment. Environmental impacts are any changes to the environment- positive or negative- that are a result of the organization's activities (USFS webpage 2005). Aspects and impacts which are of particular concern or interest to the organization are addressed in their EMS. A written plan is created in which the objectives are set, monitoring procedures are identified and a method of review is established. This allows the company to have a formalized procedure for evaluating the effectiveness of their management and their progress in areas they wish to improve. The EMS can be as broad in scope as the organization wishes to make it. There are only a few mandatory requirements in this system. They are: 1) complying with all applicable laws, 2) preventing pollution, and 3) committing to continual improvement (ISO website 2005). The plan must identify and document the roles and responsibilities of people within the organization with regard to implementing the EMS. There is one person who is designated to oversee the implementation of the EMS. They must be sure the EMS is used consistent with ISO

14001 and they must inform management of the progress as well as any needed improvements. When there is a documented occurrence of non-conformance, steps must be taken to fix the immediate problem as well as to identify how the situation can be avoided in the future (ISO website 2005). An EMS is designed to address the root cause of problems (USFS website 2005).

ISO 14001:2004 does not require auditing and certification. The system can be used purely as an internal tool for creating and monitoring a management system. The standards are voluntary; they can be used purely for increasing efficiency within an organization. If an organization chooses, for business reasons, to seek certification an independent auditor who has been accredited may be chosen to carry out the audit (ISO website 2005).

METHOD

In order to assess the readiness of the McDonald-Dunn to implement a certification system, a matrix was prepared as organized by Fletcher, Adams and Radosevich. Four matrices were prepared: 1) forest planning and monitoring, 2) forest management practices, 3) environmental considerations, and 4) socio-economic considerations. The 2005 revision of the McDonald-Dunn forest plan was compared to the standards set by SFI and the Pacific Coast version of FSC. ISO EMS was not included in the matrix comparison due to the lack of defined standards. The following is a summary of those findings. The complete matrices can be found in the appendix.

RESULTS

Sustainable Forestry Initiative Areas of Compatibility

The McDonald-Dunn is compatible with a majority of the objectives of the SFI standard. The current plan for the McDonald-Dunn is particularly strong in the requirement to calculate sustained yield. In developing the plan, maximum sustained yield was calculated and projected over the next one hundred years. The planned level of harvest is well below the growth of the forest. The management plan is also particularly strong in the area of establishing reserves or special areas. There are several reserves and special management areas identified and managed on the McDonald-Dunn Forest. The forest is also strong in the area of protecting community and cultural relationships. There are facilities and employees dedicated to allowing public use and interaction with the forest. In addition there is legal protection for culturally significant sites and resources which occur on the forest. Another area where the McDonald-Dunn Forest is especially strong is visual management. There are visually sensitive areas of the forest which have been identified and allocated to a silvicultural system which reduces the visual impacts of harvest activities. For the most part, the forest training of forest staff appears to be adequate for the requirements of SFI. The SFI standard has extensive requirements for training of employees in all aspects of management activities. The forest staff is trained in areas such as legal requirements and identification of sensitive or listed species (Deehan 2005).

Sustainable Forestry Initiative Areas of Incompatibility

The main areas that appear to be lacking are the absence of specific written policies.

The following principles must be addressed in policies:

1. Sustainable Forestry
2. Responsible Practices
3. Reforestation and Productive Capacity
4. Forest Health and Productivity
5. Long-Term Forest and Soil Productivity
6. Protection of Water Resources
7. Protection of Special Sites and Biological Diversity
8. Legal Compliance
9. Continual Improvement

The 2005 Forest Plan addresses many of these areas but some refinement might have to take place before SFI certification can occur. The Forest Plan addresses many of the areas in a broad sense. SFI requires detailed written policies.

An area that might be of concern in the future is the frequency of inventory.

Currently, the McDonald-Dunn would comply due to the combined use of growth and yield models and re-measurement to update the inventory. However, funding for inventory has been eliminated which could prevent the inventory from staying current in the future (Johnson 2005).

Forest Stewardship Council Areas of Compatibility

The new McDonald-Dunn forest plan is compatible with many of the requirements of the Pacific Coast Standard of FSC. In the area of planning, the McDonald-Dunn is strong in collecting a comprehensive inventory of a variety of site parameters, such as vegetation type, forest cover, cultural resources, and natural heritage areas. However, this inventory needs to be kept up to date, as discussed above. The Forest Plan is also strong in the area of calculating sustained yield. As mentioned above,

the sustained yield has been calculated for the next 100 years and the harvest level is set below the projected growth of the forest. This satisfies the requirement of FSC to strictly adhere to sustained yield.

The McDonald-Dunn plan includes a proposal for monitoring progress. FSC requires monitoring that is appropriate to the scale of the operation. This can range from a qualitative assessment for small woodlot owners to an in depth independent scientific review for large industrial landowners. The college forest falls in the small owner category; however they have decided to undertake a comprehensive monitoring program in order to attempt adaptive management. There are a series of sustainability measures identified for each goal of the forest which will be measured and tracked throughout the life of the plan (Fletcher, et al. 2005, pp.43-48).

The McDonald-Dunn forest also exceeds the FSC standards in several areas of forest management practices. This is most evident in the requirements for site preparation and reforestation. These requirements are largely a function of adhering to the Oregon Forest Practices Act (OFPA). There are extensive requirements in the OFPA for promptly reforesting a harvested site with the appropriate species. In addition, there are theme-specific requirements within the McDonald-Dunn plan for rapidly establishing a stand of trees after harvest. Theme One will require genetically improved planting stock as well as vegetation control. This is an area where there is potential conflict with the FSC standard. The current plan is to use chemical methods to control competing vegetation in order to allow the trees to get established and grow vigorously in the first few years after planting. FSC criterion 6.6 requires that reliance on chemical methods must be reduced with the

eventual goal of eliminating chemical use (FSC Pacific Coast Working Group 2002, p.31).

The forest plan meets the FSC expectation that thinning will be used as a management tool. Thinning is allowed in all management themes, although not specifically prescribed. The forest also exceeds FSC requirements in fire control. Again, the Oregon Forest Practices Act has specific, stringent requirements for controlling wild fires which the McDonald-Dunn must follow. For example, on all forest operations during fire season, there must be tools available to immediately control and report all fires.

In the area of environmental considerations, the McDonald-Dunn plan generally does not meet the FSC requirements; however, there are a few areas where it does. The forest protects all species required by the Endangered Species Act. They also provide protection for a sensitive species. Protection for additional sensitive species will be evaluated on a case-by-case basis. The McDonald-Dunn forest plan includes a landscape plan for providing habitat for the Northern Spotted Owl. This is one instance which would satisfy the FSC requirement to consider the impact of management activities on a landscape level. The proposed monitoring protocol might also satisfy this requirement. The FSC standard requires a more holistic view of landscape level management than is reflected by the owl plan.

The use of exotic species is another area where the plan apparently meets the FSC standard. The McDonald-Dunn plan does not specifically prohibit the use of exotics, but it also does not prescribe their use. There is a commitment to control invasive exotics,

especially false brome (Deehan 2005). However, chemical methods of control are being considered which would not be acceptable under FSC standards.

The forest also is compatible in the area of identifying special areas and reserves. The level of protection of the reserves and special areas might not be adequate for FSC standards, but they are identified and managed differently from their surrounding areas.

The McDonald-Dunn clearly exceeds the requirements in the area of protecting water and soil resources. FSC requires that all applicable laws are followed. The Oregon Forest Practices Act has extensive requirements for the protection of water. In addition, the forest participates in the Oregon Plan for Salmon and Watersheds. The college also has two research projects related to understanding and protecting water resources: 1) the Oak Creek study area and 2) a riparian area study. The management plan in tandem with the legal requirements meets the standards for protecting soil resources.

In the area of socio-economic considerations, the management of the McDonald-Dunn is very compatible with the requirements of FSC. FSC emphasizes the importance of retaining land in forest use; Oregon has very strong land use laws which satisfy the requirements of FSC.

The McDonald-Dunn has done a lot to enhance its relationship with the community and the indigenous cultures of the area. There are many cultural sites on the forest. Before any ground disturbing activity occurs, a survey is performed for cultural artifacts. If they are identified, the State Historic Preservation Office (SHPO) procedure is followed. The forest also allows recreation and public access where compatible with forest operations. There is a formal opportunity for the public to comment and review management plans

annually, as well as informal opportunities throughout the year for neighbors or interested citizens to comment. Worker relations and safety on the job is legally protected.

Another area where the management plan is very strong is in encouraging long-term economic viability of the forest management. An objective of the forest is to provide a reliable source of revenue to the college after funding management and infrastructure needs of the forest (Fletcher 2005). The management plan was crafted in such a way as to ensure this would occur.

One area where the forest is currently in compliance, although it could potentially change over time, is visual management. The current plan includes a shelterwood silvicultural system which will be employed in certain areas visible from the city of Corvallis. This is an attempt to mitigate the negative impressions people have of visible harvest units. It is not a broad commitment to managing all areas specifically for visual concerns, but it is an effort to reduce the impact to the local community.

Forest Stewardship Council Areas of Incompatibility

There are several areas which the forest would need to address if they desired to achieve FSC certification. As with SFI, FSC requires many specific written plans which do not currently exist for the McDonald-Dunn. The FSC written plan must include:

- A. Management objectives
- B. Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.
- C. Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.
- D. Rationale for rate of annual harvest and species selection.
- E. Provisions for monitoring of forest growth and dynamics.
- F. Environmental safeguards based on environmental assessments.
- G. Plans for the identification and protection of rare, threatened, and endangered species.

- H. Maps describing the forest resource base including protected areas, planned management activities and land ownership.
- I. Description and justification of harvesting techniques and equipment to be used (FSC Pacific Coast Working Group 2002, p.33).

Many of these areas are addressed in the 2005 Forest Plan but there is the possibility that more specific, technical documents would need to be prepared.

Another area that could require significant changes in paper work is chain-of-custody documentation. Currently the logs are branded and records are kept of each sale; however additional documentation would need to be completed if the forest were to achieve FSC certification.

The site preparation methods currently employed on the McDonald-Dunn would need to be altered in order to comply with FSC standards. Currently logging slash is piled and burned, a standard practice employed by the forest industry (Deehan 2005). The FSC standard calls for slash to be left distributed across the site as much as is practical.

As part of the research function of the forest, experimentation with genetically modified organisms (GMOs) could potentially occur (Deehan 2005). This is not in compliance with FSC standards. Although there are no plans to use GMOs operationally, it is doubtful the McDonald-Dunn could achieve certification if they do not specifically ban GMOs from being planted on the forest, even experimentally.

The FSC standards allow for fertilization but they discourage the use of man-made fertilizers. The McDonald-Dunn management plan calls for the use of fertilizers but does not specify the origin of what will be used. This would have to be addressed if the forest pursued certification through FSC.

FSC has a strong emphasis on maintaining natural ecosystem functions in order to maintain productivity. The McDonald-Dunn forest plan has the underlying goal of

avoiding loss of productivity but it focuses more on preventing damage to the resource rather than maintaining natural processes. As a part of the focus on maintaining natural ecosystem functions, FSC emphasizes landscape-level planning. This is partially addressed by the McDonald-Dunn South Zone landscape plan for the Northern Spotted Owl. However, FSC requires all activities be evaluated and completed with consideration to the impact it might have at the landscape level. A much more comprehensive evaluation of landscape-level effects would need to occur under FSC standards. Another area that relates to FSC's emphasis on maintaining ecosystem function is soil protection. The standards require measures to be taken to maintain or enhance the structure, fertility and biological activity. The current management policy of the forest emphasizes protection of the soil resource but does not have specific directives for the improvement of soil.

A major area of conflict between the FSC standard and the current management practices is the use and reliance on chemicals to control competing vegetation. The current practices on the forest, as well as the intended practices in the revised management plan rely heavily on the use of chemicals in order to control competing vegetation while new stands are being established. This practice would have to be eliminated in order to comply with FSC standards. New non-chemical methods would have to be developed and adopted in order to control competition while complying with FSC standards.

Environmental Management System Areas of Compatibility

The EMS-ISO approach is distinctly different from other certification systems because it is not a "one-size-fits-all" approach. The EMS-ISO system can be described as

“say what you will do and then do it.” The McDonald-Dunn has recently completed a process very similar to developing an EMS when the management plan was revised. Many of the requirements of an EMS were included in the plan. The McDonald-Dunn staff is currently in the process of establishing a protocol for implementing adaptive management and many areas have been identified as environmental concerns to be addressed through management. Examples of these concerns are the preservation of older forest structure, the restoration of Oak Savannahs, and researching silvicultural alternatives which might benefit wildlife and aesthetic values. The process of revising the written plan for the McDonald-Dunn Forest included the development of an environmental policy with specific objectives and ways to measure the accomplishment of the objectives. Implementing an EMS would only require editing or adding to the existing plan in order to meet the requirements of ISO’s 14001-2004 standard.

Environmental Management System Areas of Incompatibility

Because there are no set standards for an EMS there are no areas of incompatibility. Implementing an EMS would not require any changes in the management of the McDonald-Dunn forest, but it would require a more detailed management plan. A potential problem for implementing an EMS is that all the objectives and standards against which they will be measured must be identified. This could cause potential conflicts because the public would likely want to have input about what should or should not be included as a goal in the standard. With a system that has a rigid standard there would be no room for haggling about including one objective at the expense of another objective.

ADVANTAGES AND DISADVANTAGES OF CERTIFICATION FOR A RESEARCH AND TEACHING FOREST

The McDonald-Dunn forest is intended to be managed for the benefit of the College of Forestry. These benefits include financial support of college activities. The market premium that these systems were designed to capture has not yet materialized to the degree needed to make it worthwhile financially. The money and staff time that would have to be dedicated to certifying the forest is taken away from other projects that might ultimately provide more benefit. The forest is already managed to high standards and its management is the target of extensive public review and comment. Therefore the non-financial benefits of certification already largely exist on the forest (Salwasser 2005). There is a potential to provide a non-financial benefit of demonstration on the forest (Fletcher 2005).

Nothing in forestry is certain. Managers are dealing with a living system that is constantly changing. Although we may think now that we have the ability to identify which practices lead to sustainability, in the future we may find that we were wrong. As a research forest it is important to maintain some freedom to experiment with practices that may not be recognized today as contributing to sustainable forests. Without the freedom to research methods outside of those approved by one certification body, the forest risks becoming a laboratory for one system of management, ignoring other options that might hold promise for future management. The outreach function of the forest could potentially be restricted to those landowners who subscribe to the same certification system rather than to all landowners interested in options for forest management.

Maintaining the flexibility to experiment should be a top priority for the research forest if or when they consider implementing certification. FSC criterion 6.6 specifically states that pesticide use must be reduced and other methods used except in cases where other methods have been proven ineffective (FSC Pacific Coast Working Group 2002 p.31). This is an example of how the outreach and education function of the forest could be limited. If the forest is not allowed to experiment and develop methods for the responsible use of chemicals, their ability to advise owners on how to effectively and responsibly use chemicals will be reduced. Landowners will be looking to the forest for guidance on chemical use but the college will be restricted to demonstrating methods of non-chemical control. Currently, this would be unacceptable to many of the constituents the College seeks to serve.

Another example of the potential reduction in research freedom comes with FSC's restriction on using genetically modified organisms (GMO). The future of high productivity forests that take pressure off of native forests could be found in GMO's. If the forest is not allowed to evaluate this potential they won't be able to develop the needed guidelines for their responsible use. Again, forest managers will be looking to the McDonald-Dunn forest for guidance on intensive silviculture methods and the forest could not fulfill its role. It is important for the McDonald-Dunn to retain the current diversity of cultural regimes. There are areas where the silviculture is much less intense and chemicals or GMOs would not be of much use, but there are other areas where these methods are critical to accomplishing the goal of the regime.

There are also some potential research benefits for implementing certification. Multiple standards could be adopted and their outcomes compared. Students and faculty

could investigate how management changes under various systems. Practices that are allowed in one system might not be allowed in another. The resulting differences in forest composition and management style could then be compared. Certification is becoming a standard practice among agencies and industry alike. Given this trend, in the current revision of the Forest Management Curriculum at Oregon State University they are considering offering a certification option. Implementing certification on the McDonald-Dunn has the potential to benefit this program greatly. It would provide a valuable teaching laboratory for students as well as a demonstration tool for extension work. Teaching and research is the primary goal for the McDonald-Dunn and certification is an emerging trend that appears as if it will become a standard in the forestry field. Implementing it on the McDonald-Dunn would allow OSU to stay on the leading edge of forestry research and education.

Another benefit to consider is the value of having an independent or third party evaluation of the management of the forest. Many public agencies have implemented certification for this reason. The public is generally more comfortable that a forest is being managed well if an independent party verifies the manager's claims. This public relations benefit is seemingly satisfied by the Forest Plan's commitment to an independent review every five years. Providing an independent assessment would also be helpful for staff, who are unable to step back and evaluate the success of their management. An independent review would provide a new and valuable perspective.

A rigid certification system would apply one standard to all portions of the forest, removing some of the diversity of management methods that is so valuable for educational purposes. These are just a few examples of how a rigid certification system

could impact the research and outreach functions of the forest. On the other hand, an EMS would allow the McDonald-Dunn to identify areas they wish to concentrate on and provide a framework under which progress could be monitored and communicated to the public.

This flexibility is particularly attractive for a research forest because it doesn't enforce specific prohibitions which might be unduly constraining on research activities. For example, it would not require that pesticides or non-organic fertilizers are reduced with eventual elimination as the goal, as FSC does.

The EMS approach is also attractive for the McDonald-Dunn because they are already managed under the Oregon Forest Practices act which has many rigorous and specific requirements. Adding certification on top of the Oregon Forest Practices Act would be redundant in many areas. An EMS would allow the McDonald-Dunn to identify areas that are not specifically governed by the Forest Practices Act which it would like a system to measure their performance by.

WHICH SYSTEM

The EMS-ISO system is seemingly the most compatible with the current forest plan. While the McDonald-Dunn Forest has taken many steps towards qualifying for certification in any system due to their reasoned, scientific management, EMS-ISO appears to be the system which would best fit the mission and current management system of the Forest. There has already been significant effort put out by college staff and community members to craft a plan that has goals, standards, and measures in place. The college has in essence crafted its own standards by which it wishes to operate. These standards are in many cases above and beyond the legal requirements of the applicable state and federal laws. The EMS-ISO system allows the flexibility that is needed for research forests, while providing a credible and systematic way to assess and improve the environmental impact management has on the forest.

EMS-ISO does not require the use of a third-party certifier which significantly reduces the costs associated with achieving certification but does require an independent review. The commitment in the plan to a third party review every five years would likely satisfy this requirement. Also, much of the planning and standard setting has already been accomplished in the revision of the forest plan.

CONCLUSION

Certification is here to stay. There are many advantages to having a standard to operate by. However, the McDonald-Dunn management plan accomplishes many of the benefits a certification system would supply. It is unlikely that certification will be implemented on the McDonald-Dunn forest until such a time when markets favor certified wood. However, there are non-market benefits to certification that might prompt the McDonald-Dunn to consider adopting certification. Those advantages include teaching and research opportunities and an independent review of management performance. If certification is implemented, some changes to management practices might be necessary. The extent of those changes will vary depending on the system selected and, with any system; additional documentation would have to be developed.

BIBLIOGRAPHY

- Deehan, Ellen. Personal Interview. May 3, 2005.
- Forest Stewardship Council- Pacific Coast Working Group. "Pacific Coast (USA) Regional Forest Stewardship Standard." August 12, 2002. Version 7.9. Available online: <http://www.fscus.org/documents/index.php>. Accessed May 2005.
- Forest Stewardship Council-US Web site. Available: <http://www.fscus.org/>. Accessed May 2005.
- Fletcher, Adams and Radosevich. "Comparison of Two Forest Certification Systems and Oregon Legal Requirements." Final Report to the Oregon Department of Forestry. 14 December 2001.
- Fletcher, Rick. Personal Interview. May 4, 2005.
- Fletcher and Johnson, et al. McDonald-Dunn Forest Plan Revision. May 2005. Available online: <http://www.cof.orst.edu/resfor/>
- International Organization for Standardization Web site. Available: <http://www.iso.ch/iso/en/iso9000-14000/index.html>. Accessed May 2005.
- Jackson, Suzan. "ISO 14000 Frequently Asked Questions." Available: <http://www.iso14001.homestead.com/ISO14000FAQS.html>. Accessed May 2005.
- Johnson, Debora. "forest inventory and your paper." E-mail to Anna M. Starker. 19 May 2005.
- Laband, David N. "Why I Oppose Forest Certification." *The Consultant*. December 2004. pp 21-22.
- Salwasser, Hal. Personal Interview. May 5, 2005.
- Sustainable Forestry Board and American Forest and Paper Association. "Sustainable Forestry Initiative 2005-2009 Standard." 2004. Available online: <http://www.aboutsfb.org/sfi.htm>. Accessed May 2005.
- United States Forest Service Web page. <http://www.fs.fed.us/emc/nepa/ems/>. Accessed May 2005.
- Wallinger, R. Scott. "SFI Sustainable Forestry Initiative Program." *Journal of Forestry*. December 2003. Vol. 101, 8. pp. 9, 16-19.

Washburn, Michael P. and Katie J. Miller. "FSC Forest Stewardship Council Certification." *Journal of Forestry*. December 2003. Vol. 101, 8. Pp.8-13.

APPENDIX

Explanation of Rating System Used:

- (NR) item not required by this system
 (<) requirements or specificity less than other systems analyzed
 (=) requirements substantial and/or equal to other systems analyzed
 (>) requirements or specificity greater than other systems analyzed.

Forest Planning and Monitoring

Forest Planning & Monitoring	Required By Law	SFI	FSC-PCS	McDonald-Dunn Plan
Written Plans. <i>Required documentation of management policies and activities.</i>	(<) Operations plans sometimes required. (=)For stewardship option, plans required.	(=) Written plan required	(>) Extensive written plan required	(=) Written plan in place.
Inventory. <i>Requirements for keeping track of what exists on the land and how that changes over time.</i>	(<) Inventory required only for selected resources of public interest.	(=) Comprehensive inventory required, including biological and geological resources.	(=) Comprehensive inventory required, including a wide range of site parameters.	(=) Comprehensive inventory, including a wide range of site parameters.
Sustained Yield. <i>The ability of the land to continuously and perpetually supply society with resources of interest</i>	(<) Reforestation requirements help sustain yield over long term	(=) Calculation of sustained yield required	(>) Extensive requirements for calculation and adherence to sustained yield	(>) Sustained yield calculated and projected for 100 years, cut< growth

<p>Monitoring. <i>Requirements to track activities and assess their impact on the land.</i></p>	<p>(<) Some done by ODF, but little required for operators</p>	<p>(>) Operational monitoring required under continuous improvement objective. Also specific monitoring required for clearcuts, training and public relations</p>	<p>(=) Operational monitoring appropriate to scale of operation.</p>	<p>(>) Monitoring required for adaptive management objective; sustainability indicators identified and tracked by goal</p>
<p>Chain of Custody (COC)/Labeling. <i>Requirements for tracking wood or other products from the time they leave the forest to the time they reach the consumer</i></p>	<p>(<) Log branding required</p>	<p>(NR) Source identified labeling</p>	<p>(>) Full COC and eco-label available</p>	<p>(<) Log branding and extensive record keeping systems in place for sales of raw material</p>

Forest Management Practices

Forest Management Practices	Required Legally	SFI	FSC-PCS	McDonald-Dunn Plan
Regeneration. <i>Requirements for ensuring trees are established on a site after harvesting has taken place.</i>	(>) Extensive requirements	(=) Clear direction that sites must be promptly reforested after harvests	(=) Clear direction that sites must be promptly reforested after harvests	(>) OFPA plus extensive requirements plus requirements of theme or other use designation
Site Preparation. <i>Requirements for activities that take place post-harvest and prior to regeneration.</i>	(>) Extensive requirements for soil and water protection	(<) Minimal requirements	(NR)	(>) OFPA Extensive requirements for soil and water protection. Themes 1&2 rely on intensive site prep.
Legacy Structure. <i>Requirements for retaining trees, snags, down wood and other structural elements post-harvest.</i>	(=) 2 snags or green trees and 2 logs per acre for clearcuts greater than 25 acres.	(=) Retain stand level wildlife habitat elements.	(>) Extensive requirements. 10-30% basal area must be retained. At least 4 logs per acre, 3 to 10 snags per acre. For plantations: 4 trees and 2 snags per acre	(=) OFPA plus snag and down wood research.

<p>Genetics. <i>Requirements regarding the use of species that have been genetically manipulated in some way.</i></p>	<p>(=) Use locally adapted sources</p>	<p>(=) GMO's okay if law followed and sound scientific methods are used.</p>	<p>(>) GMO's prohibited</p>	<p>(>) Use locally adapted sources and naturally selected superior stock for themes 1 and 2.</p>
<p>Stocking Control. <i>Requirements regarding regulating the density of forest stands through harvest or other methods</i></p>	<p>(<) Only to abate forest health issues</p>	<p>(NR)</p>	<p>(>) Thinning expected</p>	<p>(=) Thinning allowed in all themes</p>
<p>Fertilization. <i>Requirements regarding the use of fertilizers to enhance the growth of trees.</i></p>	<p>(=) Fertilization allowed</p>	<p>(=) Fertilization allowed</p>	<p>(=) Fertilization allowed, but use of artificial fertilizers discouraged</p>	<p>(=) Fertilization allowed in all themes. Encouraged in themes 1 and 2.</p>
<p>Fire (including slash treatment). <i>Requirements regarding the prevention or planning for the occurrence of fire.</i></p>	<p>(>) Extensive directives, mostly for fire control</p>	<p>(=) Wildfire control and prescribed fires</p>	<p>(=) Wildfire control and prescribed fires</p>	<p>(>) OFPA. Extensive directives, mostly for fire control. College has equipment and internal training.</p>

<p>Pests & Pathogens. <i>Requirements regarding the handling of outbreaks of pests or pathogens that could harm the forest.</i></p>	<p>(=) Need to control outbreaks</p>	<p>(=) Need to control outbreaks and promote conditions which prevent outbreaks</p>	<p>(=) Non chemical methods to prevent and control outbreaks</p>	<p>(=) OFPA Need to control outbreaks</p>
<p>Access. <i>Requirements regarding the presence of roads or other means of access to the forest.</i></p>	<p>(=) Access necessary for management</p>	<p>(NR)</p>	<p>(=) Limit access to what is necessary for management</p>	<p>(>) Access necessary for management. Roads are maintained for year-round traffic</p>
<p>Harvest/Utilization. <i>Requirements regarding the methods used for harvest and requirements for increasing utilization of harvested material.</i></p>	<p>(<) No requirements for utilization</p>	<p>(=) Minimize waste and ensure efficient use.</p>	<p>(=) Minimize waste. Encourage optimal use and local processing</p>	<p>(>) Maximize revenue by exploring alternative markets. Material from each sale goes to multiple processing facilities to maximize utilization</p>
<p>Personnel & Supervision. <i>Requirements for the training and supervision of the people who carry out operations.</i></p>	<p>(=) Limited training required</p>	<p>(>) Extensive training required, also emphasis on research and education</p>	<p>(=) Training and supervision required</p>	<p>(=) Limited training required by OFPA plus case specific training for staff.</p>

Environmental Considerations

Environmental Considerations	Required Legally	SFI	FSC-PCS	McDonald-Dunn Plan
Ecological Function/ Long Term Productivity. <i>Requirements for ensuring the protection of environmental processes and the ability of the forest to maintain productivity.</i>	(<) Avoid productivity loss; emphasis is on prevention of resource damage.	(=) Avoid loss of productivity through biological conservation and other measures.	(>) Maintain natural ecological functions to maintain productivity	(=) Avoid productivity loss; emphasis is on prevention of resource damage; restore degraded ecosystems (oak woodlands and meadows)
Species Conservation. <i>Requirements for protecting and conserving species of interest and their habitats.</i>	(=) Threatened and endangered species only	(>) Manage and promote the quality and distribution of wildlife habitat through stand and landscape level plans.	(>) Specific requirements for habitat management: conservation zones, protected areas	(>) Protection for listed species and one sensitive species. Evaluated on a case by case basis.
Landscape Scale Concerns. <i>Requirements for considering the impacts of management at the landscapes level.</i>	(NR)	(>) Management at different scales	(=) Impact of activities shall be considered at the landscape level.	(=) Landscape plan for N. Spotted Owl in South Zone. Management plan is landscape level.

<p>Exotic Species. <i>Requirements regarding the use of non-native species in the forest.</i></p>	<p>(=) Use of exotic species must be justified by written declaration.</p>	<p>Use should be minimized and there must be documented research showing low risk.</p>	<p>(=) Use of exotic species must be carefully controlled and actively monitored</p>	<p>(=) Use of exotic species must be justified by written declaration. Invasive exotic species will be treated. No exotics are prescribed in the plan</p>
<p>Reserves/Special Areas. <i>Requirements for creating or maintaining areas to protect unique areas.</i></p>	<p>(=) Special areas protected</p>	<p>(=) Must identify and manage in a way that recognizes their special qualities.</p>	<p>(>) Special areas protected and reserve areas established.</p>	<p>(>) Special areas protected and reserves are established, but could be changed</p>
<p>Water Resources. <i>Requirements for the protection water quality and quantity.</i></p>	<p>(>) Extensive directives for water protection including riparian buffer requirements.</p>	<p>(=) Must meet water laws. Protect water quality. Riparian protection is required.</p>	<p>(=) Meet or exceed water laws.</p>	<p>(>) Extensive directives for water protection. Participate in Oregon Plan for Salmon & Watersheds. Participate in Oak Creek study area and riparian study.</p>
<p>Soil Resources. <i>Requirements for protecting the integrity and function of the soil on the site.</i></p>	<p>(=)</p>	<p>(=) Written policy to protect and maintain productivity</p>	<p>(=) Measures taken to maintain or enhance structure, fertility and biological activity</p>	<p>(=) Meet or exceed all laws</p>

<p>Chemicals. <i>Requirements or restrictions on the use of chemicals in forest operations.</i></p>	<p>(=) Notification required for each application</p>	<p>(=) Meet or exceed laws; minimize use, be economically and environmental ly responsible and train employees</p>	<p>(>) Use must be justified, with eventual elimination of use the goal</p>	<p>(=) OFPA laws. Will be used to establish plantations and possibly to control exotics</p>
<p>Air Quality. <i>Requirements for protecting the quality of the air during forest operations.</i></p>	<p>(>) Air is public asset and is specifically protected by law</p>	<p>(NR)</p>	<p>(NR)</p>	<p>(>) Air is public asset and is specifically protected by law</p>
<p>Plantation Establishment. <i>Allowance for establishing plantations</i></p>	<p>(=) No prohibitions as long as stocking and growth requirements are met</p>	<p>(=) Plantations allowed if all standards met</p>	<p>(>) Area allowed in plantation is restricted.</p>	<p>(=) Plantations comprise a large portion of the forest, Themes 1 and 2 especially.</p>
<p>Plantation Management. <i>Requirements for using plantation management techniques.</i></p>	<p>(NR)</p>	<p>(=) No restrictions as long as standards are met.</p>	<p>(>) Harvest openings average less than 40 acres, maximum of 80 acres. Adjacent areas have trees at least 10 feet tall or have achieved crown closure. Rely on biological control rather than chemical.</p>	<p>(>) Extensive directives for the establishment of plantations in Themes 1 and 2.</p>

Socio-Economic Considerations

Socio-Economic Considerations	Required Legally	SFI	FSC-PCS	McDonald-Dunn Plan
Land Tenure & Use. <i>Requirements for maintaining the land in forest use.</i>	(> Retaining land in forest use is mandated by state law	(NR)	(=) Use and tenure are points of emphasis	(> Retaining land in forest use is mandated by state law.
Community & Cultural Relations. <i>Requirements for responsible actions that will benefit the community as a whole and to protect cultural resources that are provided by the forest.</i>	(=) Public values are focus	(=) Focus is broader public. Staff must be retained for public outreach	(> Specific references and responsibility to local communities and indigenous people	(=) Plans in place for recreation, protection of cultural sites, seek public review and comment
Worker Relations. <i>Requirements regulating the treatment of workers and their safety.</i>	(> Worker rights and safety are specifically protected	(=) Significant training required for employees	(> Must show evidence of good conditions for workers and use local labor when possible	(> Legally Required
Economic Viability/Stability. <i>Requirements to manage in a manner that will ensure the long term economic success of forestry.</i>	(< Only broad goal is stated	(< Addressed implicitly through the SFI Standard	(=) Long term economic viability is goal; reinvestment required	(=) Long-term revenue for the college is a primary goal. Plans include funding of management and the needed infrastructure.

<p>Legal & Other Policy Requirements. <i>Requirements to follow all applicable laws and policies.</i></p>	<p>(>) Strictly bound to make and administer laws</p>	<p>(<) Must meet reforestation, water and chemical laws</p>	<p>(=) Must meet or exceed all applicable laws</p>	<p>(=) Must follow all applicable laws</p>
<p>Visual Management. <i>Requirements that consider and manage for the visual impact of activities.</i></p>	<p>(=) Visual management required for scenic corridors</p>	<p>(>) Major emphasis on visual management</p>	<p>(=)</p>	<p>(>) OFPA and The visual impact of management on areas seen from Corvallis is considered with Theme 3. Foresters trained in visual impacts of forestry.</p>