Revised Final

FSC Regional Forest Certification Standard

for the

Southwestern United States
Version 7.0
2/10/05

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15. Under review by the accreditation committee to the FSC board of directors.

The report includes the Forest Certification Standard for the Southwestern United States. This standard was developed by the Southwest Regional Working Group and is presented to the Forest Stewardship Council (FSC) for approval as the regional standard for the southwestern region.

The standard in this document is based on the FSC-U.S. National Indicators, which were modified to address regional ecological, social, and economic conditions. After approval by the FSC- U.S. Board and the FSC Secretariat, the Southwest standard must be considered by FSC-accredited certification bodies conducting assessments within the Southwest region.

Coordinator

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Introduction

REGIONAL DELINEATION

The southwestern region of the United States, as defined for the purposes of Forest Stewardship Council standards, is defined as the states of New Mexico and Arizona, and the southern parts of Utah and Colorado *below* the zone in which lodgepole pine becomes a major forest type. The northern boundary of the region is thus an ecological one. The western, southern, and eastern boundaries, while nominally political, are de facto ecological boundaries given the wide gap in forest coverage that coincides with these political lines. The forest economy of the region is relatively peculiar because lacks a corporate timber presence and land base. The southwest region is also characterized by a distinctive cultural mix (Native American, Hispano-American, and Anglo-American) and climate (arid) that contribute further to its discreteness.

STANDARD DEVELOPMENT PROCESS

This report is the product of five years of challenging discussion, debate, and stakeholder collaboration. The Southwest Regional Certification Standard was developed by the Southwest Working Group, which is a committee authorized by FSC-U.S. Several years ago, FSC-U.S. organized working groups in nine regions of the contiguous 48 states and charged them with developing a regional standard to augment those contained in the Forest Stewardship Council (FSC) Principles and Criteria.

Regional working groups developed drafts of the regional standards. The original Southwest standard was submitted to the FSC Secretariat in 1998, and was the first regional standard in the United States to be approved for formal endorsement as soon as pre-conditions set were fulfilled to the FSC Executive Director's satisfaction. Before the pre-conditions were completely addressed, the FSC-US established a Standards Committee that developed a set of national indicators to serve as guidelines for the regional working groups. The Southwest Working Group reconciled their draft regional standard with the conditions specified by FSC International and the FSC-US National Indicators during 2000- 2002. The draft standard was posted on FSC's website during the fall of 2001 for a 60-day period in order to glean public comments. Those comments, as well as suggestions by the Standard Committee, were incorporated into this document.

The FSC-US Standards Committee and the FSC-US Board of Directors reviewed and approved the Southwest Standard, respectively on July 18 2002 and August 12,2002.

REGIONAL WORKING GROUP

The original Southwest Working Group was comprised of 27 volunteers from diverse backgrounds and various locations within the region (see Appendix C). The group was recruited by direct solicitation and open nomination in the course of a series of six public information sessions held throughout the winter of 1996-1997. The original Working Group met six times from May 1997 to May 1998. Participation was balanced across environmental, social, and economic chambers. The group included individuals ranging in age from their early thirties to late sixties. Four members were women. Two members were Native Americans and a third directed an academic program for Native Americans. The issue of Principle #3 was submitted to a special working group drawn from Native American tribes and relevant government agencies, such as the Bureau of Indian Affairs. A wide range of professional backgrounds was represented in the Working Group, which included

forestry, hydrology, economics, soils science, botany, politics, poetry, and nuclear physics. Four individuals represented environmental organizations. Staff from state-level natural resource agencies and the USDA Forest Service also participated in the Working Group.

After a somewhat prolonged hiatus pending the development of the US National Indicators, the Working Group reconvened to address possible revisions based on counsel from FSC and the US Standards Committee. At this time, there were some changes in composition in terms of individuals involved, but not in the representation of the three chambers (see Appendix C). The reconvened Working Group labored extensively by email and a two-day in-person meeting in the summer of 2001.

DECISION-MAKING PROCESS

The Working Group made decisions by general consensus in the absence of obstructions. Obstructions were defined as an unwillingness to accept a decision, as opposed to a disagreement *and* a willingness to accept a decision. Three or fewer obstructions could be over-ruled by a 75% vote of members present. Otherwise, with four or more obstructions (less than a 75% over-rule), discussion would be continued until consensus was reached.

PEER REVIEW

The standard was sent to approximately 20 peer reviewers during the course of developing the first draft; the reviewers represented a variety of interests and expertise. The peer-review process was specifically used to incorporated interests that were not well represented in the Working Group, such as the Hispanic community and the timber industry. The peer-review process also incorporated the perspectives of nationally known conservation biologists and certifiers. Certifiers found the standards satisfactory. The Working Group was asked to respond to individual comments, and revisions were made by majority vote.

STAKEHOLDER REVIEW

The first draft was issued to approximately 600 stakeholders in the region, which including all FSC members. The members were provided a thirty-day comment period. Comments received were pooled and distributed to the Working Group. Revisions were again incorporated through a majority vote. Throughout the process, concerns expressed by outside parties have been forwarded to the Working Group by the coordinator.

PUBLIC COMMENT

A second public review, lasting two months, was held in the fall of 2001 after revisions were developed based on the first review and conditional approval by FSC and the US National Indicators. This time, draft standards were posted on both the FSC-US website and the Forest Trust website. No comments were received at this stage.

FIELD TEST

A field test of the draft Southwest Standard was conducted by SCS on the White Mountain Apache Reservation in June 2002. The draft standard worked well. A number of minor revisions and only two substantial revisions were proposed, all of which were addressed by the Regional Working Group.

TRANSPARENCY AND INCLUSIVITY OF THE PROCESS

The development process was open throughout. Seven initial informational sessions were initially held throughout the region. In addition, the preliminary informal gathering process of the Working Group, as well as public review of the standard were widely announced throughout the region. Summaries of Working-Group meetings were available through the coordinator. Copies of the draft standard were provided on request. Other requests for information received prompt responses. There were no restrictions in circulating documents. Individuals interested in becoming involved in the Working Group were invited to do so as desired.

PROVISIONS FOR THE FUTURE

Several Working-Group members have indicated a willingness to participate in future revisions of the standard, as directed by the FSC. Experience in the conduct of assessments in the region over the next several years will enable certifiers to determine the effectiveness of the standard. The first field test of the regional standard indicated that it was clear and functional, with minor revisions having been proposed, all of which have been incorporated. The development of new research findings in the region, as well as new technology and markets, may also result in a call for review of the standard by various stakeholders. At present, regular, formal reviews should be initiated by the FSC-US.

DISPUTE RESOLUTION

To date, there have been no disputes that have required any sort of formal resolution. In the context of the standard development, the procedure settled on by the Working Group in the contingency of a dispute that required formal resolution was a consensus decision by the Group itself, which, if unsuccessful, would be followed by referral to the FSC-US. Disputes related to certification assessments and decisions should be referred to the FSC-US if they are not resolved by the relevant parties.

INTER-REGIONAL HARMONIZATION

The National Indicators are the principal tool for harmonization and cross-border standardization. The Regional Working Group provided input into development of the FSC National Indicators; conversely, the regional coordinator worked closely with the FSC-US Standards Committee on the development of the Southwest Regional Standard. Approval by the FSC-US assures that the standard is consistent with those of other regions of the U.S. While similarities do exist between the Southwest and northern Mexico, concerns over harmonization will have to be addressed as standards are developed in that region of Mexico.

This work, plus the public review of the standard, provide documentation of the harmonization of the Southwest and other regions in the U.S.

The Rocky Mountain Region borders the Southwest Region and shares some similar forest types. The standard for the Rocky Mountain has been completed and approved by the FSC. Some members of the Southwest Working Group were involved in the Rocky Mountain process, and the Southwest coordinator provided assistance to the Rocky Mountain coordinator on procedural issues, as well as sharing considerable amounts of information. Moreover, the Southwest Regional Coordinator served on the US Standards Committee that reviewed the Rocky Mountain standard, and was thus familiar with that document in the course of finalizing the Southwest Standard. The two sets of standards are essentially consistent and conform to the US National Indicators, with differences between the regional standards reflecting differences in ecology, economics, and social issues. Other designated regions in the United States are decisively separated from the Southwest by geographical characteristics and bear little similarity to the region.

GUIDANCE TO CERTIFIERS/APPLICATION OF THIS STANDARD

The Southwest Regional Certification Standard has been arranged to conform to the FSC's Principles and Criteria (P&C) and the FSC-U.S. National Indicators. Concepts and requirements expressed in the FSC Principles and Criteria are included in the proposed standard for the Southwest Region of the United States. Those Criteria are considered an applicable standard, and during an assessment, FSC accredited certification bodies are expected to evaluate the degree to which each Criterion is met in the same manner as they evaluate the regional indicators. In some instances, regional indicators have been added that apply specifically to the Southwest Region. Where no indicators are provided, the relevant criterion is considered to be sufficiently specific to be directly assessed in the field.

This standard is a tool that must be applied with professional discretion by FSC accredited certification bodies, so the Southwest Working Group elected not to establish any "fatal flaw, preferring that FSC accredited certification bodies evaluate the cumulative weight of adherence to the overall body of the standard. The standard seeks to establish a rigorous performance bar that forest managers must clear to be certified, while providing managers latitude in selecting methods used to meet the performance objectives and giving FSC accredited certification bodies sufficient flexibility to exercise professional judgment.

In the context of the United States Southwest Standard, failure at the level of any one particular criterion does not preclude a positive certification decision.

PLANTATION MANAGEMENT

Plantation systems are not currently employed in the Southwest. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. National Indicators will be employed during the interim.

PRINCIPLE LEVEL FAILURE

In the SW region, an FSC Principle level failure (which precludes award of certification until appropriately corrected, or revocation of certification) results from the fundamental inability to achieve the goal of an FSC Principle through a major non-compliance that

1. has continued for one year or longer,
2. is systematic throughout the management organization,
3. has created adverse effects over a wide area, including lands controlled by the forest owner or manager as well as lands within the 2nd order watersheds immediately adjacent to the FMU.

SCALE-BASED INTERPRETATION/APPLICATION OF THE STANDARD

The Working Group recognizes differences in the economic capacity of various operators to fully carry out all the tasks referenced in the standard. The standard is to be interpreted in a way that balances requirements for desirable forest management activities within the limitations of economics and the best available science.

For example, it is financially unreasonable to expect a small landowner to conduct regular, rigorous monitoring of conditions pertaining to soil, water, and so forth. The typical 2,000-acre non-industrial private forest in the region cannot access the same monitoring resources as a corporate timber interest with extensive forest holdings or a US Forest Service Ranger District. The Working Group therefore directs certifiers to take account of economic capacities in scoring forest management operations. Operations with the requisite capacity should be conducting rigorous monitoring on soils, water, and other forest characteristics.

Certifiers must devote heightened scrutiny to public-forest management with considerable budgets and public-trust mandates. Management of public forests must be held to the most rigorous interpretation of the Southwest standard.

Discretionary leeway is not be interpreted by certifiers as a *carte blanche* for small forest management operations. This means, for instance, that small forest management operations must demonstrate a level of monitoring that is reasonable, given an operation's capacities. A small landowner or forestry consultant must be able to demonstrate an ability to track changes in the forest through time in such a way as to guide management planning and take corrective action when necessary. In sensitive areas, the forest owner or manager must take the necessary extra steps despite its size.

In all circumstances, high-intensity operations that pose potential risks of long-term compositional and structural change in a forest must activate the most rigorous interpretations of scientific standards for inventory, monitoring, and so forth. In a certification context, such operations present serious concerns and must therefore provide the utmost level of assurance that they are as sustainable as possible.

The concerns, expressed here in regard to monitoring, are be extrapolated throughout the standard in regard to issues, such as the maintenance of reserve areas and inventory requirements.

PUBLIC LANDS ISSUES

These regional indicators are considered by the U.S Standard Committee to exemplify sufficient scientific and technical rigor to be applied to any assessments conducted by accredited FSC accredited certification bodies in the Southwest. Indicators specific to public lands have been included in Principle 6. Additional indicators of performance, specific to their particular public mandates, may be required. The Southwest Working Group believes that the FSC-accredited certification body has the responsibility to develop additional indicators for these public-land expectations, on a case-by-case basis.

For information on the certification of federal lands and the applicability of these standards in that context see FSC-US federal lands certification policy at: http://www.fscus.org/documents/.

PERIODIC REVIEW PROCESS

The FSC-US Board will periodically review this standard during the accreditation period. At a minimum a comprehensive review will be conducted no later than 6 months prior to the expiration of the endorsement period (e.g. no later than February 26, 2008). During the review period the FSC-US Board will solicit feedback from Working Group members, certificate holders, certifying bodies, FSC members, interested individuals and the general public. Information from scoping will be reviewed by the FSC-US Board and incorporated into the standard as needed.

SOUTHWESTERN FORESTS

A relatively limited range of major forest types occur in the Southwest, and most of these occur as forested "montane islands." All forest types, from riparian broadleaf forests in the valleys to alpine bristlecone pine, play important ecological and social roles and need to be considered in the context of the standard where they occur. From a commercial management standpoint, however, there are four basic forest types of regional importance: ponderosa pine, mixed conifer (ponderosa pine, Douglas-fir, white fir), spruce-fir (Englemann spruce, corkbark or subalpine fir), and aspen. Mixes of tree species in these types tend to be simple. Habitat classifications (such as those described in USDA Forest Service General Technical Report RM-131) based on combined overstory/understory characteristics exhibit a greater level of diversity. Extensive pinyon-juniper woodlands also play an important economic role.

Ponderosa pine is the major forest type in the Southwest, though there is some intra-regional variation in predominance. Pine accounts for approximately 88% of the forest cover in Arizona, while Utah's forestlands are predominantly spruce-fir and aspen types. These differences in forest type derive from variations in general landscape features between southern states with broad mid-elevation plateaus and northern states with more mountainous landscapes.

Lowland-riparian forests which typically including a mix of cottonwood, willow, and other broadleaf species, have suffered drastic reductions in extent and quality throughout the region due to a combination of grazing, harvesting, mining, dams, and invasive exotic plants. In the arid Southwest, native riparian communities play an enormously important role for habitat, landscape connectivity, and water quality and quantity. Many riparian areas throughout the region are in dire need of restoration.

A number of examples of high-quality forest management can be found throughout the region, across a spectrum of forest types, and ownership classes and sizes. However, historical forest management practices in the region have been largely unsuccessful from the standpoint of long-term sustainability. Significant acreages of private forestland in the region have been subjected to extractive activities with little thought for long-term management (e.g. clear-cut logging for mining timbers, reduction of forest cover for purposes of livestock grazing, and forest high-grading). Such activities have contributed to substantial changes in forest structure, functions, and composition over time. On all lands, overall-management activities (including harvesting, fire and fuels management, grazing, etc.) have given rise to substantial acreages that are overstocked with slow-growing small-diameter trees. Moreover, recent FIA data suggest that, regionally, mortality continues to outpace growth in several of the larger-diameter classes among species and localities. Clear-cutting and seed tree harvests in all forest types but aspen have frequently required costly and repeated planting to secure regeneration, and in many cases, have resulted in understocking. While clear-cutting has fallen out of favor, uneven-aged silvicultural approaches generally remain poorly developed.

Restoration. The suppression of wildfire and the lack of prescribed burning, combined with overgrazing by livestock, has resulted in even more significant alterations of vegetative communities and the habitats they provide. Overstocking of trees in the small-diameter classes, impaired soil conditions, changed water-flow regimes, encroachment of woody species into openings, loss of aspen, and catastrophic fire in the pine type have been identified as growing problems throughout the region. As a result, there is now widespread need for and concern with forest "restoration." Ecological restoration is still a young science and is still largely in the stage of experimentation. Some significant research has been conducted in the region to develop and refine management approaches. At the same time, there remains a great deal of experimentation and research to be done.

Fire. A central element in the development of forest restoration strategies is the role of fire. Prescribed burning has only recently been reintroduced in the region, and the understanding and skill level of forest managers in working with prescribed fire is still largely in the development stage. Public tolerance for the effects of prescribed burning has not been adequately gauged, and it remains to be seen if the smoke and liability involved with significant levels of prescribed burning will be tolerated. Prescribed burning also comes at a cost, and it remains unclear if the public and private landowners are willing to shoulder the burden. At the same time, the results of fire suppression continue to unfold in the form of shifts in species compositions, increased magnitude of fires in some forest types, and increased tree densities. Whether, forest managers in the region will confront the array of challenges related to fire and its role in forest ecosystems (through prescribed burning; transformation in response to wildfires; or other management interventions, including timber harvest) remains to be seen.

Rare Wildlife Species. Endangered species have received a great deal of attention in the region in the last decade. Concerns over the Mexican spotted owl and the northern goshawk have caused substantial changes in management on national forests. The lynx is now a major focal point of forest management in Colorado. Re-introduction of the New Mexico wolf is also underway in a limited area of the national forest lands in Arizona and New Mexico.

Exotics. The ecological and economic ramifications of invasive exotic species are another cause of growing concern in the region. Native riparian tree and shrub species are being out-competed by Siberian elm, Russian olive, and tamarisk. Overgrazing by livestock has made forest understories and grasslands vulnerable to a wide range of weed species, including spurge and thistles. Finally,

ever-increasing road densities have contributed to the spread of invasive weeds. The removal of exotic plants can expensive, and many techniques are still in experimental stages.

Insects and Other Pathogens. Like other areas of the country, the Southwest region must contend with variety of problems that deal with forest insects and diseases, which include: the bark beetles, western spruce budworm, western tent caterpillar, and dwarf mistletoe. While often locally severe, few of these problems have reached epidemic proportions on a regional level. However, the historical management practices described above have created conditions that may result in future infestations and levels of infection far beyond that which we have experienced in the past. For example, dense ponderosa pine stands are highly susceptible to bark beetle infestation. As observed in neighboring regions, when these overstocked forests persist across a landscape, catastrophic results can occur. Within the limits of available science, a proactive approach is needed to move Southwestern forests toward a more natural structure and composition. Sound forest management can address most of the problems with insects and diseases in the region.

Industrial Practices. The arid climate of the region generally does not support high growth rates in tree species. This is probably the primary reason underlying the scarcity of industrial landholdings and associated intensive management regimes in the region. As a result, the use of plantation regimes, genetically modified trees, and chemical biocides, has been minimal, and it is unlikely that such components will attain to any significance in the region in the near future.

Old growth and other rare/sensitive ecosystems

The Working Group recognizes that:

1) Old-growth forest conditions, as well as a number of other forest types, such as riparian forests, have been severely reduced in the Southwest. Further reductions in these diminished types cannot be countenanced within the context of certification. This means there are no ecological grounds to allow fundamental shifts in structures and composition or new roads or other fragmentation of existing old-growth and/or riparian forests as a result management interventions.

2) The onus falls on the forest owner or manager to demonstrate that the impacts of any management activities in old-growth stands and other sensitive forest types are benign.

3) Past management interventions, such as fire suppression and livestock grazing may have created conditions requiring restoration practices to be employed in old-growth and other rare/sensitive ecosystems. This is particularly the case with respect to excessive numbers of small stems or "dog-hair" in ponderosa pine stands. Harvesting that clearly forms part of a restoration regime is acceptable inasmuch as such harvesting is carried out in harmony with other certification standards and remains restricted to restoration objectives.

REGIONAL SOCIO-ECONOMIC CONSIDERATIONS

Forest Ownership

Forestland in the Four Corners area is predominantly publicly owned and managed by federal agencies. Ownership of the remaining forest varies widely among the states, however. For example, private landowners account for a greater percentage of commercial forest acreage (27 percent) in New Mexico than in Arizona (1 percent), and tribal ownerships are much more significant in the two southern states than Colorado or Utah. Industrial ownership of land is not a factor in the region, and indeed, the number of larger industrial timber companies and their

participation in the regional forest economy is marginal when compared to the rest of the country. Most large forest ownerships in the region have a mix of forest and other ecotypes, such as grasslands.

Non-industrial private ownerships (NIPFs) in the region range from small parcels of one to several hundred acres all the way to over a million acres. Some large ranches have paid forest management staff, but the management of most properties is worked out among landowners and their agents and loggers. The number of private consultants is low compared with most other regions of the country. State forestry agencies provide management assistance to a number of NIPFs. Public forests are managed by the forestry staff of relevant agencies. Some tribal entities in the region maintain professional forestry staffs, although most rely at least in part on the Bureau of Indian Affairs (BIA) division of forestry for assistance.

Demographics

For the entire area, the recent population growth rate of 21.2 percent far exceeds the national average of 9.3 percent. The Four Corners region is adding slightly more than 200,000 people every ten years. This increase is generating attendant pressures on forests, such as new roads, heavier traffic, and habitat fragmentation, and is, at the same time, fueling concern over so-called "wildland-urban interface."

Forest Economics

As of 1998, the unemployment rate of 9.8 percent in the Four Corners region was higher than the national average of 5.3 percent. At 11.7%, Arizona had the highest unemployment rate, while Colorado had the lowest at 6.8 percent. Several New Mexico counties had an unemployment percentage higher than 15 percent. In 1989, the average percent of families below the poverty level in the Four Corners region was 19.5 percent. Large mill shutdowns in the mid- to late 1990s resulted in substantial loss of jobs and income in the wood products sector, and initiated a transition period marked by a growing small- and medium-sized forest-products sector. Nevertheless, the regional forest products sector continues to decline with mill and business closures occurring on a regular basis. Despite the pull out of large industrial operations, the large, remaining players still tend to dominate the forest economy. For instance, it is estimated that roughly 80 percent of the timber (45,000 MBF) milled in New Mexico is processed by two companies. In Arizona, the Fort Apache Timber Company (FATCO), a tribal operation milling 68,000 Mbf per year, owns sixty-eight percent of the state's conversion capacity. While recent research findings have indicated that wood products are not a significant contributor to the overall economy in the region, a good deal of business involved in the forest "economy" involves subsistence use, goods for trade, and informal sale arrangements. For many rural communities, the wood products sector is an important component of the often poorly diversified local economy.

Historical Conflicts Over Land

The history of migration and conquest is still fresh in peoples' minds in the region, in which diverse cultures –(Native American, Hispanic, and Northern European) continue to thrive. There are, however, a number of cases of long-running disputes over land ownership and tenure. Examples include the Navajo-Hopi land dispute and ongoing litigation over the demarcation of traditional Hispanic Land Grants in New Mexico. In many of these disputes, access to forest resources plays an important role. Local access to forests and forest resources remains critical, and conflict over access to resources persists, even where ownership is no longer in dispute, both on National Forest lands and large private ranches. As elsewhere in the nation, there is substantial debate over the appropriate use of federal lands, particularly national forests, in this case flavored

heavily by the particular cultural histories of the region.

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Applicability Note to Regional Standard regarding certification of federal lands. The process for certifying federal lands must comply with the FSC-US Board approved Federal Lands Policy and Federal Lands Findings, both of which are available at www.fscus.org/documents/. Certifiers should consult the Federal lands policy and findings to determine whether there are FSC-US approved indicators specific to the type of federal property being assessed, which must used in addition to these regional standards.

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES

Forest Management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

1.1 Forest Management shall respect all national, and local laws and administrative requirements.

1.1.a. Forest owners or managers comply with all relevant national, state, tribal, county, and municipal laws, case law, and administrative requirements. A partial list of relevant laws is provided in Appendix A.

> *For example, there is no evidence of continued or intentional non-compliance with legislation that relates to forest management by either the owner or manager.*

1.1.b. Forestry operations meet or exceed the current forest-practice regulations, best-management practices for forestry, and other protective measures for water quality that exist within the state(s) or other appropriate jurisdiction(s) in which the operations occur (e.g., a county or a tribal reservation).

1.1.c. To the extent required by law, forest owners or managers share public information, provide open records, and have procedures in place for public participation.

> *NOTE: This indicator should not be interpreted as limiting other indicators, criteria, or principles contained in this standard for public information or stakeholder participation.*

1.1.d. Management plans and activities are compatible with community goals for the protection and use of natural resources as articulated in current and approved community plans and community zoning laws.

1.2 All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.

1.2.a. Taxes on forestland and timber, as well as other fees related to forest management, are paid in a timely manner and in accordance with relevant federal, state, county, municipal, and tribal laws.

1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.

Applicability note: Forest owners and managers are not expected to be familiar with all the requirements of all relevant treaties and agreements.

Please refer to Appendix A for a list of applicable international and regional agreements.

1.3.a. Forest owners or managers comply with treaties, including those with American Indian tribes, and other international agreements that have been signed by the President of the United States, ratified by the Senate and have entered into force. (Note: see Analysis of US Government Procedures for Abiding with Treaties, FSC-US, 3/10/03).

1.4 Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and the involved or affected parties.

Applicability note to Criterion 1.4.: Verification of compliance with FSC Principles is required for the issuance of a certificate. When the certifier (i.e., the FSC-accredited certification body) and the forest owner or manager determine that compliance with applicable laws and the FSC Principles and criteria cannot be simultaneously achieved, the matter is referred to the FSC Secretariat.

1.5 Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities.

1.5.a. Forest owners or managers implement measures to prevent illegal and unauthorized activities, and report any suspected illegal or unauthorized activities in a timely fashion.

> *For example, measures may include marking and posting boundaries, fencing, gating access roads, and/or conducting periodic inspections of management areas.*

1.6 Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.

Applicability note to Criterion 1.6.: Assessment of this criterion is guided by both FSC Policy and Guidelines: Partial Certification for Large Ownerships, BM19.24, May 2000 (http://www.fsc.org/en/whats_new/documents/Docs_cent/2) and the FSC Guidelines for Certification Bodies FSC STD-20-001).

1.6.a. Forest owners or managers provide written statements of commitment to the FSC Principles and Criteria. The commitment is stated in the management plan [see 7.1], a document prepared for the certification process, or another official document.

For example:
· The management plan explicitly endorses FSC Principles and Criteria.
· Forest owners and managers support FSC Principles and Criteria through public presentations.

1.6.b. Forest owners or managers notify certifiers of changes in ownership and/or management planning.

1.6.c. Owners dedicate land to long-term forest management.

For example, land is enrolled in programs and techniques such as: Forestry Incentive Program, Forestland Enhancement Program, Forest Stewardship Program, state "forest-agricultural classification," the Tree Farm System, Forest Legacy Program, conservation easements, and so on.

1.6.d Forest owners or managers document the reasons for seeking partial certification.

PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES

Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

2.1 Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated.

2.1.a. Forest owners or managers provide information on legal and customary rights associated with the forest (both their own and those held by others) that may have an impact on management of the forest.

2.1.b. Land boundaries are clearly identified on the ground by the forest owner or manager prior to commencement of management activities.

2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

2.2.a. Forest owners or managers allow well-established customary and lawful uses of the forest to the extent they are: (1) consistent with conservation of the forest resources, and (2) provide local communities with adequately managed access to traditional forest products and services.

Examples of non-consumptive customary uses may include:
- *well-used paths*
- *prominent viewing points and landscape features*
- *historical features*
- *religious and ceremonial sites*

Examples of consumptive customary uses may include:
- *fishing and hunting*
- *recreation*
- *wildcrafting (basketry, wreaths, etc.)*
- *gathering wild food, including herbs and mushrooms*
- *cutting firewood and gathering*
- *grazing livestock*

2.2.b. On ownerships where customary rights of use and traditional and/or cultural areas exist, forest owners or managers maintain ongoing consultation with customary users in the planning and implementation of forest management activities that affect the rights or areas in question.

2.3 Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

Applicability note: If either the status of tenure to or relevant use rights on the forest is under litigation that has persisted beyond proposed dismissals or summary judgments, or is under active review by a legislative body, then initial certification is precluded until litigation is resolved. Existing certification may remain valid, however, pending the procedural outcome.

2.3.a. The forest owner and manager maintains relations with community stakeholders to identify disputes in their early stages. If disputes arise, the forest owner or manager initially attempts to resolve them through open communication, negotiation, and/or mediation, and evidence is provided that demonstrates the owner's efforts to work with the organization in resolving the dispute. If negotiation fails, federal, state, local, and/or tribal laws are employed to resolve land-tenure (see Glossary) claims.

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS

The legal and customary rights of indigenous peoples to own, use and manage their lands, territories and resources shall be recognized and respected.

Applicability Note: The terms "tribes", "tribal" or "American Indian groups" in indicators under Principle 3 include all indigenous people in the US, groups or individuals, who may be organized in recognized or unrecognized tribes, bands, communities, chapters, villages, districts, clans, groups, nations, pueblos (see Glossary), or other native groups.

3.1 Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.

3.1.a. Forest management planning on tribal lands includes a process for input by tribal members in accordance with their laws and customs. Tribal peoples, when and where they so desire, take a leading role in forest management planning on tribal lands.

3.1.b. Forest managers of tribal lands routinely use tribal experience, knowledge, practices, and insights in forest management planning and operations.

3.1.c. Where the extent of rights is in dispute, a culturally appropriate process for addressing and resolving grievances is in place.

3.1.d. Forest management takes place only after securing the informed consent of tribes or individual tribal members (such as allottees, see Glossary) whose forest is being considered for management.

3.1.e. Areas of restricted access on tribal lands are defined with the full control and consent of tribal members or their representatives. Identification of those areas is made through consultation with tribal members or their representatives.

3.1.f. Forestry projects, under non-tribal management operating on tribal lands, provide documentary evidence of the agreements under which non-tribal entities are entitled to implement management within the forests.

3.2 Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples.

3.2.a. Forest owners and managers provide information on the identity, location, and population of all tribal peoples (e.g. tribes, communities, chapters, villages, districts, clans, groups) living within, or claiming customary rights to, the management area. Forest managers identify and contact American Indian groups that have current legal or customary rights to use the management area, and afford them the opportunity to participate in planning forestry operations that affect their resources.

3.2.b. On lands adjacent to tribal lands and on other lands, where management operations might negatively affect tribal lands or resources, steps are taken to ensure that such operations conserve the tribal resources.

3.2.c. If damage to tribal resources results from forest management activities, tribes are fairly compensated through mechanisms developed with the participation of local tribal people.

3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers.

3.3.a. Forest owners or managers make systematic efforts to identify areas of cultural, historical, or religious significance within the property proposed for certification, and implement mechanisms to ensure that forestry operations do not damage or interfere with such sites. Such efforts include surveying, recording, assessment, and establishment of reserve areas, as well as the input of tribal representatives (e.g. through interviews, questionnaires, and/or field visits). Where culturally sensitive areas are identified, surveys are undertaken before operations commence that may affect such areas. The areas in question may include:

- areas of spiritual or religious value, such as burial sites, spirit caves, vision quest areas, ceremonial grounds
- sites from which ceremonial materials, such as medicinal plants are gathered
- lands containing unique historical, archaeological, and architectural sites
- areas of traditional use (e.g. trapping; hunting; fishing; berry picking; pinyon nut, acorn, and mesquite bean collecting)
- areas of outstanding scenic value, recreational or wilderness potential.

For example, equipment operators and project supervisors are aware of the potential to disrupt areas of archaeological or cultural significance.

3.3.b. Forest management and tribal representatives jointly develop measures to protect and/or enhance areas of special significance.

3.3.c. Confidentiality with respect to areas of special significance is maintained in keeping with applicable laws and the requirements of tribal representatives.

3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.

3.4.a. Forest owners and managers respect the confidentiality of tribal knowledge and assist in the protection of tribal intellectual property rights. When traditional tribal knowledge is used in forest management, intellectual property rights are protected through protocols developed with the participation of involved tribal peoples.

3.4.b. A written agreement is reached with individual American Indians and/or tribes prior to commercialization of their indigenous intellectual property, traditional ecological knowledge, and/or forest resources. The individuals and/or tribes are fairly compensated when such commercialization takes place.

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKERS' RIGHTS

Forest management operations shall maintain or enhance the long-term social and economic well being of forest workers and local communities.

4.1 The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services.

4.1.a. Forest work is packaged and offered in ways that create quality work opportunities for employees, contractors, and their workers.

For example, quality work may include the following attributes:
- *stable, long-term employee-contractor relationships*
- *a mixture of diverse tasks that require varying levels of skill*
- *opportunities for advancement*
- *a comprehensive package of benefits*
- *opportunities for employee and contractor participation in decision-making*

4.1.b. To the extent possible, given such constraints as economic viability, as well as locally available expertise and harvesting equipment, forest owners and managers procure goods and services locally and provide employment opportunities for local residents and businesses.

For example:
- *Forest owners or managers use qualified local foresters, loggers, and contractors.*
- *Forest managers and their contractors give preference to qualified local workers.*

4.1.c. Forest owners and managers provide and/or support activities that afford opportunities for small local businesses or for professional advancement of workers, such as the following:
- worker training
- development of procedures for small-scale timber sales
- long-term contracts for resource restoration and enhancement

4.1.d. Depending on such factors as the presence, availability, and capacity of local mills, timber and other forest products are locally processed and available.

4.1.e. Forests are used as training or educational resources for local people in conjunction with schools, community colleges, and/or other providers of training and education. Forest owners or managers contribute in some way to public education about forestry practices (e.g., demonstration, press exposure, research, presentations).

4.1.f. Forest owners, managers, and/or employees are active members of local and regional communities surrounding the forest (e.g., involvement in local politics, support of local community organizations, forestry organizations, or local education or conservation programs).

4.1.g. Hiring practices and remuneration packages, including wages, compare favorably with prevailing local standards, and are equivalent for local and non-local workers.

4.1.h. Forest owners and managers assure that contractors, subcontractors, intermediaries, and persons hired by them are covered and protected by all state and federal labor laws regarding discrimination, wages, benefits, and other conditions of employment.

For example:
- *Contracts contain clauses specific to legal coverage and protection.*
- *Owners and managers monitor compliance with laws.*
- *Employees are not discriminated against because of gender, race, sexual orientation, religion, age, or disability.*

4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.

4.2.a. Workers' rights, including occupational safety are respected. Benefits (health, retirement, worker's compensation, housing, and food) compare favorably with prevailing local standards, and are equivalent for local and non-local workers.

4.2.b. Worker safety is a priority in all aspects of forest operations. Forest owners or managers and their contractors develop and implement safety programs and procedures that include:

- well-maintained and safe machinery and equipment
- education and continued improvement of conditions
- incentives to reduce workers' compensation costs that are non-discriminatory, non-punitive, and based on improved safety training
- documentation and posting of safety procedures in the workplace
- safety records, training reports, and certificates that, when appropriate, are publicly accessible
- contracts that include safety requirements; and
- appropriate safety equipment (e.g., hardhat, eye protection, Kevlar chaps, gloves, hearing protection, suitable footwear) provided for or contractually mandated for all workers.

4.3 The rights of workers to organize and voluntarily negotiate with their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organization (ILO).

Applicability Note: Compliance with this criterion can be accomplished with guidance from: FSC Certification and the ILO Conventions, FSC Policy Paper and Guidelines, 20 May 2002 available at http://www.fsc.org/en/whats_new/documents/Docs_cent/2.

4.3.a. Forest owners or managers and their contractors resolve disputes with workers through culturally sensitive mechanisms.

Examples of culturally sensitive mechanisms are:
- *translation and cultural interpretation as needed*
- *cross-cultural training as needed to integrate the workforce*

4.3.b. Forest owners and managers allow the involvement of non-governmental organizations in legal training, negotiations, and monitoring of workers' rights.

4.4 Management 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.

Applicability Note: People and groups directly affected by management operations may include: employees and contractors of the landowner, neighbors, fishers and hunters, recreationalists, local water users, and forest products processors.

4.4.a. Forest owners and managers participate in the development and achievement of goals for the protection and use of forest and natural resource as articulated in local and regional plans.

For example, such involvement may consist of participation in planning watershed management, community fuels and fire management, and/or implementation of management activities in accord with such planning.

4.4.b. Harvest operations and roads are designed to minimize negative aesthetic impacts, especially in the vicinity of high-use areas, such as scenic highways and vacation communities.

4.4.c. When management activities have the potential to negatively affect the surrounding area, forest owners or managers provide a general description of the proposed activities (e.g., prescribed burn) and potential effects (e.g., smoke, noise, traffic, sedimentation) to all adjacent landowners and/or other directly affected communities in order to solicit their comments or concerns prior to the commencement of operations. The level of public notice is based on the likely magnitude of impacts.

4.4.d. Forest owners and managers demonstrate their responsiveness to feedback received in the context of indicator 4.4.c. (e.g., proposed activities are modified, mitigations are arranged, explanations are provided).

4.4.e. Significant archeological sites and sites of cultural, historical, or community significance are designated as special management zones or otherwise protected during harvest operations.

Note: *Effective designations may necessitate consultation with state archeological offices, tribes, universities, and local experts.*

4.5 Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage.

4.5.a. Forest owners and managers attempt to resolve grievances and mitigate damage resulting from forest management activities through open communication and negotiation prior to legal action.

4.5.b. Compensation or mitigation is provided to local communities and adjacent landowners for substantiated damage to crops, game, trees, land, other managed resources, impairment of essential environmental functions (water quality), or loss of income.

4.5.c. Forest owners or managers and their contractors maintain liability insurance or post bonds that are adequate to cover potential liabilities.

PRINCIPLE #5 BENEFITS FROM THE FOREST

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.

5.1.a Forest management has, or will generate, sufficient resources (e.g., assets, cash reserves, profits) to carry out the management plan.

5.1.b. Investment and reinvestment in forest management are sufficient to fulfill management objectives and maintain and/or restore forest health and productivity.

5.1.c. Responses (e.g., increases in harvests or debt load) to short-term financial factors (such as fluctuations in the market, requirements for cash flow, need for sawmill equipment and log supplies) are limited to levels that enable fulfillment of the management plan.

5.2. Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.

5.2.a. Forest owners or managers optimize the overall economic, social, and ecological utilization of individual trees and tree species, while giving consideration to such factors as non-timber forest products and value-added processing.

For example:

- *New products are explored and developed for common but less-used species of trees or grades of lumber (e.g., white fir and small-diameter ponderosa pine for products such as oriented and laminated strand board, pellets, vigas, latillas, and fuelwood).*
- *Access to new markets is explored and developed.*

5.2.b. Whenever possible (under ecological, economic, and social constraints, such as the need for particular equipment and/or other special characteristics of a proposed harvest), technical and financial specifications of forest-product sales allow reasonable competition by small, local businesses.

5.3. Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.

5.3.a. Felling, skidding/yarding, bucking, sorting, and handling are carried out in a way that optimizes both the volume and value of logs, while giving consideration to 5.2.a. and 5.2.b above.

5.3.b. Harvests are implemented in a way that protects the integrity of residual stands. Provisions concerning acceptable levels of damage to residual trees are included in operational contracts and are met in practice (e.g., by the use of directional felling; equipment tailored to the site conditions, such as soil and stand structure; and appropriate silvicultural systems).

5.3.c. In the course of operations under forest management's control, product wastage is minimized from the woods operation through the processing plant, and where waste does accrue, it is used in a productive process.

For example:
- *Slash is left for nutrient cycling or distributed for firewood.*
- *Sawdust is converted to energy.*
- *Slabs are sold for fencing.*

5.4 Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single product.

5.4.a. Forest owners and managers diversify forest uses and products, which may include recreation; specialty products, ; livestock grazing; hunting; and non-consumptive uses.

5.5 Forest management operations shall recognize, maintain and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.

Note: The Southwest working group feels that adherence to this criterion is best measured by the general performance of forest owners and managers in meeting the regional standard as a whole and that specific indicators for this criterion would be redundant to indicators found throughout the rest of the standard.

5.6 The rate of harvest of forest products shall not exceed levels which can be permanently sustained.

5.6.a. The target age-class distribution required for sustainability and predicted yields of volume and value is based on empirical information, which may include data on growth and regeneration, site index, soils classification, and disturbance regimes. The required level of documentation is determined by the scale and intensity of the operation.

For example, stocking rates and volumes conform to projections of the management plan.

5.6.b. Actual harvest volumes are within management plan projections (see section 7.1.d). Harvest volumes are generally less than or equal to actual growth and do not exceed projections by more than 5% over a 10-year running average.

Note: Harvests may exceed plan projections to address unforeseen ecological concerns, such as large-scale disturbance events (See indicator 6.3.c.4). Such deviations from the plan are addressed by a recalculation of future allowable harvests within the time frame designated for the current periodic allowable cut (see sub-criterion 7.1.d), and mortality must be fully accounted for.

PRINCIPLE #6: ENVIRONMENTAL IMPACTS
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 the ecological functions and the integrity of the forest.

Applicability Note: Small landowners who practice low-intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments (e.g., formal assessments by scientists) are expected to be carried out by large landowners and/or those who practice more intensive forestry (see Glossary).

6.1 Assessment of environmental impacts shall be completed - appropriate to the scale and intensity of forest management and the uniqueness of the affected resources - and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.

6.1.a. Using available science and local expertise, an assessment of current conditions is completed that includes: (1) ecological processes, such as disturbance regimes; (2) vulnerable, rare, and threatened biotic communities; (3) common plants, animals, and their habitats; (4) sensitive (state listed), rare, threatened, and endangered (federally listed) species and their habitats; (5) water resources; and (6) soil resources. (see also 7.1.a and b)

6.1.b. Using available science and local expertise, the current ecological conditions are compared to the historical conditions (roughly within the last 200 years) within the landscape context by using the baseline factors identified in 6.1.a.

6.1.c. Prior to the commencement of management activities on a given site, potential short-term environmental impacts are accurately evaluated and their cumulative effects are projected based on current scientific understanding.

6.1.d. Using assessments derived from the above information, options are developed and implemented to maintain and/or restore the long-term ecological functions of the forest (see also 7.1.c). Ecological functions include, but are not limited to, hydrologic flow, nutrient cycling, provision of terrestrial and aquatic habitat, and soil processes.

6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.

Applicability Note: *Indicators for this criterion addresses and distinguishes between state and federally listed species, which typically involve a set of legal requirements, as well as distinguishing among other species of concern that may not involve legal requirements, but nevertheless merit special management attention or protection in the context of the FSC P&C.*

6.2.a. If scientific data (including state and/or federal listings and species' databases (e.g., NatureServe, Natural Heritage Inventory Maps)) indicate the presence or likely presence of a legally protected, threatened, or endangered species (TES), then either a survey is conducted prior to management activities being carried out (to verify the species' presence or absence) or the forest owner or manager manages as though the species was present, according to the following guidelines:

- Legally required surveys are conducted to ascertain the presence or potential presence of TES in question (see criterion 6.1.a, point (4)). In the absence of legal requirements, ownerships are inventoried and evaluated following scientifically credible (see Glossary) TES-survey protocols, such as those used for State and Federal lands or tribal lands.
- Relevant documentation and maps are prepared and maintained.
- Presence of TES, if determined, is reported to the manager of that species database.
- Management practices are evaluated to ascertain their potential impact on the TES in question and/or its habitat prior to implementation of management activities, and the necessary modifications are made to the management plan.
- Management activities are compatible with the maintenance, improvement, or restoration of the TES in question and/or its habitat.

6.2.b. If scientific data (including state or federal listings and species databases (e.g., NatureServe, Natural Heritage Inventory Maps)) indicate the presence or likely presence of recognized rare or sensitive plant/animal species, populations or communities/ecosystems (e.g., localized wet meadows; riparian forest; cienegas; or other communities, such as those defined by the Natural Heritage System Natural Community Classification and/or the World Wildlife Fund's Forest Communities of Highest Conservation Concern) that are not legally protected, then:

- Either surveys for and inventories of plant/animal species, populations, or communities in question are conducted (see standard 6.1.a (4)) and documented with appropriate data and maps; or presence is assumed, and relevant documentation and maps are prepared and maintained.
- Ecosystems in question are mapped and maintained, enhanced, or restored for unique characteristics and functions in the landscape.
- Management practices are evaluated to ascertain their potential impact on the species/areas in question and/or their habitat prior to implementation of management activities, and the necessary modifications are made to the management plan.
- Management activities are compatible with the maintenance, improvement, or restoration of the species and/or plant community types in question.

Note: The effectiveness of forest management in complying with indicator 6.2.b is to be considered in the context of economic viability, as well as the scale and intensity of management. The restoration of special habitats and/or communities that are currently absent from an ownership, but whose restoration might enhance the viability of legally protected species or other species of special interest, is encouraged.

6.2.c. Within the context of existing landscape and ownership patterns, conservation zones for species, communities, and other protected areas (as described in 6.2.a and b above) are arranged and/or maintained to enhance the viability of habitats and their connectivity.

6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:
a) Forest regeneration and succession.
b) Genetic, species and ecosystem diversity.
c) Natural cycles that affect the productivity of the forest ecosystem

APPLICABILITY TO OLD GROWTH:

Due to the scarcity of old-growth forests in the conterminous states, they are normally designated as High Conservation Value Forests (see Principle 9).

Certified old-growth forests not designated as High Conservation Value Forest are managed to maintain or enhance: (1) the abundance of old and large trees and (2) the landscape- and stand-level structures associated with old-growth forests in a manner that is consistent with the composition and structures produced by natural processes.

Forest Management activities that retain and/or enhance such old-growth characteristics are considered appropriate.

For a list of references on old-growth in the southwest, see Appendix B.

a. forest regeneration and succession

6.3.a.1. Forest owners or managers use the following information to make management decisions: landscape patterns (e.g., land use/land cover, non-forest uses, habitat types); ecological characteristics of adjacent forested stands (e.g., age, productivity, health); species' requirements; and frequency, distribution, and intensity of natural disturbances.

Applicability Note: This indicator may have limited applicability for managers of small and mid-sized forest properties because of their limited ability to coordinate their activities with other owners within the landscape, or to significantly maintain and/or improve landscape-scale vegetative patterns. For owners and managers of forests of all sizes, it is acknowledged that specific information about adjacent lands may not be available.

6.3.a.2. Silvicultural practices generate stand conditions that result in successional phases that would occur naturally on the site, and managers avoid blanket applications of any harvesting prescription in order to maintain a mixed landscape that includes different seral stages.

6.3.a.3. Natural regeneration forms the basis for silvicultural systems.

> *For example, regeneration harvests create favorable conditions for seedling establishment (e.g., seedbeds; light conditions; leaving seed trees upslope or upwind; leaving seed trees with desirable phenotypic characteristics, such as straight boles and healthy crowns).*

Note: Planting may be used as necessary to supplement natural regeneration, restore species diversity, fill gaps, contribute to conservation of genetic resources and facilitate ecological

restoration, but does not replace the natural biotic plant community. In such cases, seed and seedlings of local origin are used for planting or restocking.

6.3.a.4. Forest management is guided by the intensity, frequency, and magnitude of the characteristic natural disturbance regimes.

6.3.a.5. In instances where even-aged silviculture is employed, forest managers ensure that the density and composition of advanced regeneration is consistent with the species and characteristics of the site prior to final overstory removal.

Note: Clear-cutting and coppicing, which do not rely on advance regeneration, but rather on post-harvest regeneration, are an exception and must be planned in accordance with other indicators, in particular, 6.3.a.4, 6.3.a.6; 6.3.b.6, and 6.3.b.7.

6.3.a.6. The size of harvest openings is based on: (1) the natural regeneration requirements of the species on the site, (2) the need to provide horizontal heterogeneity to restore the landscape or forest mosaic, and (3) requirements to protect the site (soil, hydrology).

Note: Deviation from these guidelines may be necessary to control insects and disease.

6.3.a.7. All old-growth stands are identified and managed to conserve old-growth characteristics. Fragments of old-growth, whose ecological integrity and function as old-growth are in question, are evaluated for their current ecological importance and their potential to help restore areas of older forest and their associated habitats across the landscape. If an evaluation determines that an old-growth fragment is ecologically important, it is maintained. (see Appendix B for current references on ecological definitions of old-growth stands and habitats.)

b. genetic, species, and ecosystem diversity

6.3.b.1. Management activities maintain or restore species diversity and richness, increase vertical and horizontal structure, and maintain or restore applicable canopy-gap patterns at stand and landscape levels.

> *For example, in the case of native tree species that may be appropriate to a given site but are present at unnaturally low numbers, such as stands with a diminished representation of Douglas-fir due to past harvesting, levels of natural or artificial recruitment will be maintained or enhanced prior to harvesting mature individuals to assured the species' continued presence.*

6.3.b.2. Forest management practices retain or restore habitat features necessary for native wildlife on both the stand and landscape levels.

> *For example:*
> - *Forest management practices promote habitat features, such as connected forests or openings, vernal pools, vertical structural diversity, large down woody material, and cavity-and mast-producing trees.*
> - *Habitat for natural insect predators (e.g., spiders, birds, and bats) is provided by managing for structural and species diversity in general, as well as managing for specific elements, such as snags, coarse woody debris, and tall trees for nesting.*
> - *Forest management maintains and/or restores an average of at least three snags per acre dispersed across the landscape. Snags are representative of the larger sizes of dominant species and "hard" and "soft" decay classes.*

6.3.b.3. Forest owners and managers maintain or restore portions of the forest to the range and distribution of age classes of trees that result from processes that would naturally occur on the site.

6.3.b.4. Management activities maintain or restore naturally occurring forest continuity and connectivity, and minimize the extent of unnatural edge and forest fragmentation.

For example:
- *Openings are irregular in shape.*
- *Wildlife corridors are uninterrupted.*
- *Clearing and/or patch sizes are minimized.*
- *Road densities are minimized.*

6.3.b.5. Forest owners and managers select trees for harvest, retention, and planting in a detailed and consistent manner that maintains or enhances the productive capacity, genetic diversity and quality, and species diversity of the residual stand.

For example, residual stands include a range of trees representing the diversity of the pre-harvest stand, such as larger, high-value individuals and individuals of poor timber value that, nevertheless, make important ecological contributions (also see standard 6.3.b.7).

6.3.b.6. The choice of silvicultural systems (even-and uneven-aged) is ecologically justified (i.e., based on shade tolerance of relevant species, natural disturbance regimes, and naturally occurring age and size structures) and minimizes environmental impacts.

For example:
- *Uneven-aged management is appropriate for predominately multi-aged forest types, such as ponderosa pine.*
- *Even-aged silviculture is appropriate for predominately even-aged forest types, such as aspen.*

6.3.b.7. When even-aged management (see Glossary) is employed, live trees and native vegetation are retained within the harvest unit in a proportion and configuration that is consistent with the characteristic natural disturbance regime in each community type (see Glossary), unless retention at a lower level is necessary for purposes of restoration or rehabilitation. The level of retention increases proportionally to the size of the harvest unit. (See indicator 6.3.b.5)

6.3.b.8. When significant modification of natural stand structure and composition has occurred through the human alteration of disturbance regimes (e.g., preponderance of slow-growing, small diameter trees in the ponderosa pine type due to disruption of fire regimes through grazing, fire suppression, and timber harvest), stand structure and composition are restored to conditions that approximate to those of the unaltered disturbance regime. Such management is carried out conservatively, in accord with the most up-to-date research and procedures for monitoring, and is consistent with other ecological and management objectives.

c. Natural cycles that affect the productivity of the forest ecosystem

6.3.c.1. Management practices maintain or restore coarse woody debris in amounts adequate to maintain such characteristics as soil, habitat, and conditions of moisture for the particular forest type. Coarse woody debris is well distributed by size and decay classes across the forest.

6.3.c.2. Post-harvest management activities maintain soil fertility, structure, and functions. Where possible, slash (especially leaves, needles, and small branches) remains on-site for its benefits to nutrient cycling. Design of slash treatments is guided by risk of fire and insect outbreak, and the capabilities of machinery in use.

6.3.c.3. Responses to large-scale disturbance events (such as salvage after wildfire, blowdown, and pest/pathogen epidemics) balance ecological conditions (e.g., the number trees left as large snags and large woody debris on the forest floor, soil structure) and economic considerations (e.g., potential for insect outbreak, catastrophic fire, or financial hardship due to resource loss). Prescriptions and their justifications are documented in the form of a comprehensive, written plan.

For example:
- *Coarse woody debris is maintained.*
- *Den trees and snags are maintained.*
- *Natural background levels of 'pest' populations are accepted before pest control is carried out.*

6.3.c.4. Where natural processes, such as fire, have been interrupted by human activity, forest management practices restore such processes within the bounds of economic viability, ecological understanding, technical capacity, and social/legal concerns (see indicator 6.3.b.8).

For example, on larger ownerships, a "let burn" policy is adopted for some wildfires.

6.3.c.5. If the quality of forest soil is degraded, as indicated by such characteristics as compaction, nutrient depletion, crown fade, puddling, erosion, and mass wasting, management practices are modified accordingly.

For example:
- *Primary management objectives shift from commercial production to restoration.*
- *Site preparation is minimized.*
- *Design and construction of the road system is upgraded.*
- *The lightest practical equipment with the lowest ground pressure is used.*
- *Whole-tree harvesting is discontinued, and tops are left in the forest.*
- *Longer rotations and a diversity of species are used in lieu of artificial fertilization.*
- *Natural early successional processes are allowed and/or encouraged.*

6.3.c.6. Non-timber management activities meet the same standards for maintenance of ecological integrity as timber activities.

6.4 Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.
Applicability Notes:

When forest management activities (including timber harvest) create and maintain conditions that emulate an intact, mature forest or other successional phases that may be under-represented in the landscape, the management system that created those conditions may be used to maintain them, and the area may be considered as a representative sample for the purposes of meeting this criterion.

Ecologically viable representative samples are designated to serve one or more of three purposes: (1) to establish and/or maintain an ecological reference condition; (2) to create or maintain an

under-represented ecological condition (e.g., successional phases of a forest type or natural community (see Glossary); and (3) to protect a feature that is sensitive, rare, or unique in the landscape. Areas serving the purposes of (1) and (2) may move across the landscape as under-represented conditions change, or may be fixed in area and managed to maintain the desired conditions. Areas serving the purposes of (3) are fixed in location.

For managed forest communities in the Southwest, ecologically mature or late-successional phases (not including old growth) would qualify as representative sample areas under purposes 1 and 2. Tolerant or long-lived mid-tolerant species (e.g., ponderosa pine.) typically dominate such stands. Depending on the site and forest community, characteristics may include a well-developed understory flora, relative stability of species composition, multi-layered canopies, stable or declining live timber volume, live trees in upper quartile of expected diameter growth for the site, presence of recognized late-successional indicator species (such as certain mosses, lichens or other epiphytes), and accumulation of large snags and large downed woody material. An example of a classification system that include some of these concepts is found in Mehl, Mel S. 1992 Old-Growth Descriptions for the Major Forest Cover Types in the Rocky Mountain Region. In: Kaufmann, M.R., W.H. Moir and R.L. Bassett, Tech Coords., Old Growth Forests in the Southwest and Rocky Mountain Regions: Proceedings of a workshop. USDA Forest Service General Technical Report RM-213. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colorado. Other classification systems are referenced in Appendix B of the standard.

For representative sample areas that may move across the landscape as conditions change (purposes 1 and 2), the length of time that an area is maintained as a representative area will vary with the rarity of the ecosystem type and specific ecological value to be conserved, the uniqueness of the represented condition, the rate at which areas with similar characteristics develop.

Examples of representative samples fixed in place and serving purpose 3 include relatively exceptional features such as cienegas, riparian areas, vernal pools, areas surrounding caves, and areas of special soils containing endemic plant species.

In most cases, intact old-growth (see Glossary) will qualify as representative sample under purpose 3 due to their rarity in the Southwest Region. Unentered old-growth stands (see Glossary) are also prime candidates for designation as representative sample areas under purpose 3. In both cases, the burden is on the landowner/manager to demonstrate that these areas should NOT qualify as representative sample areas under purpose 3. Other very old forests (over 150 years old) that do not meet the Southwest Standard's strict definition of "old growth" (e.g., there is some evidence of past harvesting) should also be considered as potential representative sample areas under purpose 3

Forests of all sizes may be conducive to protection of fixed features, such as rock outcrops and cienegas. Medium sized and large forests may be more conducive to the maintenance of successional phases and disturbance patterns than small forests.

While public lands (see Glossary) are expected to bear primary responsibility for protecting representative samples of existing ecosystems, FSC certification of private lands can contribute to such protection.

Representative samples may be protected solely by the conditions of the certificate and/or through the use of conservation easements or other instruments of long-term protection.

6.4.a. Forest owners and managers protect and reserve ecologically viable representative areas that are appropriate to the scale and intensity of the operation.

6.4.b. Where existing protected areas within the landscape are not of adequate size and configuration to serve as representative samples of commonly occurring forest types as defined above, owners or managers of mid-sized and large forests, whose properties are conducive to the establishment of such areas, designate ecologically viable areas to serve these purposes.

Applicability notes to 6.4.b.: When evaluating the need for representative sample areas, the assessment should consider the relative rarity and degree of protection of similar areas at the state-wide scale, or at the biophysical region scale (as defined by state Natural Heritage programs) if Natural Heritage program or other assessments suggest that there is significant variation in community or ecosystem types between biophysical regions. Where existing protected areas adequately represent commonly occurring forest types in the landscape, these areas may suffice as the representative samples and no representative sample need be established on the forest.

The owner or manager of a small forest may not be expected to designate representative sample(s) of commonly occurring forest types, except where there is an exceptional opportunity to contribute to an under-represented protected areas system. For small forests or low-intensity managed forests, this criterion is satisfied by meeting the standards of Criterion 6.2.

The size and configuration of the representative areas depend on the:
(1) extent of representation of their forest types within the landscape (less protection calls for more representative samples);
(2) ecological importance of setting aside stands and tracts to other conservation efforts (a minimum size and ecological value is needed to make representative samples useful); and
(3) intensity of forest management within the forest and across the landscape (a less intensively managed forest or landscape calls for less area of representative samples, and a more intensively managed forest or landscape calls for more).

6.4.c. The size and arrangement and time scale of on-site representative sample areas are designated and justified using assessment methods and sources of up-to-date information described in 6.1.

Note: Known protected off-ownership areas that are in proximity to the management unit may be used to meet the goal in the landscape.

6.4.d. Unless exceptional circumstances can be documented, known areas of intact old-growth forests are designated as representative sample areas under purpose 3. (See Applicability Note under 6.4 above) and are reviewed for designation as High Conservation Value Forests (HCVF- see also Applicability note under 6.3). Known areas of unentered stands of old-growth are carefully reviewed, screened for uniqueness, and considered as potential representative sample areas prior to undertaking any active management within them (see Applicability Note under 6.4). Old growth stands not designated as either a HCVF or a representative sample area are, at a minimum, managed

to maintain their old-growth structure, composition, and ecological functions under purpose 3.

6.4.e. The size and extent of representative samples on public lands being considered for certification is determined through a transparent planning process that not only utilizes scientifically credible analyses and expertise but is also accessible and responsive to the public.

6.4.f. The process and rationale used to determine the size and extent of representative samples are explicitly described in the public summary.

6.4.g. Managers of large, contiguous public forests (>50,000 acres) create and maintain representative protected areas within the forest area, sufficient in size to encompass the scale and pattern of expected natural disturbances while maintaining the full range of forest types and successional stages resulting from the natural disturbance regime.

6.5 Written guidelines shall be prepared and implemented to: control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.

6.5.a. Forest owners and managers develop a logging plan for each harvest operation and effectively monitor the implementation of the logging plan (either directly or through designated administrators). The logging plan includes:

- techniques and timing for timber harvests
- the design and impact of the transportation system, which includes roads and skid trails
- protection of soil
- protection of residual stands
- treatment of slash, which includes fuel loads
- protection of stream courses and riparian areas
- map(s) depicting the road system, skid trails or corridors, landings, protected areas, representative sample areas, hydrology, soil types, wildlife habitat, and forest cover types and/or natural communities.

6.5.b. Forest owners and managers select harvesting layout and techniques based on stand characteristics, terrain, vegetation, hydrology, and soils, as well as economic considerations.

> *Examples include designating skid trails, directional felling, end-lining, horse logging, and aerial yarding.*

6.5.c. The frequency and intensity of harvest operations, as well as the techniques and machinery employed, minimizes damage to regeneration, residual trees, and other stand characteristics.

6.5.d. Logging operations use the layout and transportation system identified in the management plan. The layout minimizes the extent of roads, off-road soil compaction, and erosion. Best management practices (BMPs) are identified and met or exceeded to minimize the effects of roads, skid trails, and landings in locales for which they have been developed. Where BMPs have not been developed, the most relevant and rigorous existing BMPs, such as New Mexico BMPs,

Colorado BMPs, Utah Forest Water Quality Guidelines, and USFS Road Construction Handbook, as well as other applicable guidelines, are adapted and employed to the same end.

For example:

- *Forest management rehabilitates and stabilizes existing road networks and minimizes construction of new roads.*
- *Measures are taken to reduce road densities, which includes road abandonment and obliteration.*
- *Roads needed for future access are closed to entry if not needed after a forest operation, and steps are taken to reduce erosion and maintain the quality of a road's condition until the next entry.*
- *When new roads are constructed, they fit the lay of the land; minimize cut and fill; and avoid designated stream buffer zones, except for points of crossing.*
- *Roads constructed with outslopes and rolling dips wherever practical.*
- *Roads are located in areas where they are unlikely to cause slope destabilization or mass failure/landslides.*
- *Failed drainage structures or areas of active erosion are identified as part of the management planning process, and measures are taken to correct the drainage problems and stabilize erosion.*

6.5.e. Roads do not substantially increase (e.g., to a level that compromises the condition of streams or water quality) the delivery of sediment to stream and riparian areas. Tools and methods, such as control structures, road design, maintenance, and timing of road use, are employed to minimize the transport of sediments to watercourses. (See standards in section 6.5.d.)

6.5.f. Damage to the soil (including sedimentation, compaction, rutting, erosion, and landslides) resulting from forest operations is kept within limits that do not impair such characteristics as regenerative capacity, structure, and retention of moisture as appropriate to the soil type in question. Areas that exhibit an extreme risk of landslide are excluded from logging. (Note: "Extreme risk" may be a legally binding term in some states.)

6.5.g. Water Quality And Buffer Zones

Applicability Note: With respect to natural watercourses, waterbodies, and associated riparian zones and vegetation, the maintenance, enhancement, or restoration of the following functions are considered top priorities:

- *filtration of sediments and control of erosion, which includes the stabilization of the streambanks and channel*
- *moderating fluctuations in water temperatures*
- *contributing nutrients and organic debris (including large-diameter wood) to the aquatic habitat*
- *providing habitat (shelter, water, food, travel corridors, and so on) for riparian-dependent species of plants and animals, to help maintain biodiversity within the landscape.*

6.5.g.1. Buffer zones are established for all natural stream and watercourses with definable banks (see Glossary), and for ponds, lakes and wetlands. Buffer zones are measured horizontally (in such a way that ground slope does not reduce the distance) from the following:

- the upland edge of the riparian vegetation (if present),
- each bank of a stream or water course (in the absence of riparian vegetation), or
- the edge of the wetland or water body. (*Note*: Where wetlands abut watercourses, the edge of the buffer zone is measured from the edge of the wetland.)

Buffer-zone width is determined as follows:

- where riparian vegetation is present, at least 30 feet beyond the edge of the riparian vegetation or 100 feet from the stream edge, whichever is greater;
- where riparian vegetation is not present, at least 50 feet on either side of all perennial streams, intermittent streams that flow two to three or more months of the year, or along the edge of waterbodies; such buffer zones extend wider on steep or erosive slopes;
- where sideslopes exceed 35 percent, the width is at least 100 feet
- as necessary along ephemeral drainage patterns that exhibit a definable bank to protect the functions listed in the applicability note above;
- width is increased in areas of buffer-zone sensitivity (e.g. unstable slopes), which is ultimately determined by the potential for resource damage or degradation of the functions listed in the applicability note above.

6.5.g.2. Management in the buffer zone maintains, enhances, or restores the condition of the riparian area or streamside zone.

For example:

- *Thinning from below and planting trees may be carried out for purposes of controlling erosion restoration.*

- *Ecological, aquatic, and riparian functions (e.g., the maintenance or restoration of riparian microclimates) are demonstrably the priority silvicultural objective of any commercial harvesting.*

6.5.g.3. Transportation systems and mechanical operations (including any form of significant ground-disturbing activity) in buffer zones do not compromise the functions listed in the applicability note for sub-criterion 6.5.g. above.

For example:

- *Permanent roads are maintained or installed only as necessary to cross streams at a perpendicular or other angle that causes the least ecological disturbance.*

Note: Temporary roads or designated skid trails across a buffer zone may be permitted in rare instances after preparation of a pre-operation plan that protects riparian values.

- *Operation of wheeled or tracked equipment is restricted to roads and designated crossings.*
- *Temporary or permanent culverts, bridges, or other mechanisms are installed at all watercourse crossings to avoid disturbance to, and to support the designated use(s) of the affected watercourses.*
- *Streams, vernal pools, and wetlands are undisturbed by skidding activities.*
- *Stream crossings are located and constructed to minimize fragmentation of aquatic habitat (see Glossary) and maintain water quality.*
- *Maintenance of existing roads and ditches uses appropriate techniques to protect water quality from adverse impacts.*
- *Storage, handling, or use of hazardous materials is prohibited in buffer zones.*

Note: Full suspension yarding is also an option so long as it does not compromise the buffer zone.

6.5.g.4. Where the scale and intensity of forest management activities have the potential to substantially affect the intensity and timing of water flow, such activities are designed to maintain or enhance aquatic and riparian habitat and /or downstream uses.

For example, extensive removal of timber in harvests on south-facing slopes is done in a way that does not substantially increase the speed with which snow melts.

6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.

6.6.a. Forest owners and managers demonstrate compliance with FSC Policy paper: "Chemical Pesticides in Certified Forests, Interpretation of the FSC Principles and Criteria, July 2002" (available at http://www.fsc.org/en/whats_new/documents/Docs_cent/2) and comply with prohibitions and/or restrictions on World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement.

6.6.b Chemicals are used only when non-chemical alternatives have proven ineffective in correcting an ecological imbalance. Such use takes place only as part of the integrated pest or weed management system (see Glossary) described in the management plan (7.1.f.2.a) and is accompanied by the cessation or effective modification of activities creating the imbalance.

Regional examples of ecological imbalances include:

- *occupation and transformation of riparian zones by species, such as Russian olive and tamarisk*
- *loss of quality forage for wildlife due to overgrazing*
- *spread of invasive weeds due to the proliferation of roads*

6.6.c. Chemicals are applied as specifically as possible to protect non-target species, non-target areas, and water supplies.

6.6.d. Whenever chemicals are being used, a written statement is developed and made available that clearly describes and substantiates the management need for the use of chemicals, the risks and benefits of their use, the precautions that workers employ, and any research being conducted by the applicant to develop alternatives. Records are kept of pest occurrences, control measures, and incidences of worker exposure to chemicals.

6.6.e. Forest management employs means other than the use of poisons to control vertebrate pests.

6.7 Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.

6.7.a. In the event of a spill of hazardous material, forest owners or managers immediately contain the material, report the spill as required by applicable regulations, and engage qualified personnel to perform the appropriate removal and remediation.

6.7.b. Broken and/or leaking equipment and parts are repaired or removed from the forest; discarded parts are taken to a designated disposal facility.

6.7.c. Equipment is not parked in riparian management zones, near sinkholes, or supplies of ground water, where fluids can leak into them.

6.7.d. Waste lubricants, anti-freeze, containers, and related trash are stored in leak-proof containers until they are transported to an approved off-site disposal facility.

6.8 Use of biological control agents shall be documented, minimized, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.

Applicability Note: Genetically improved organisms (e.g., Mendelian crossed) are not considered to be genetically modified organisms (see Glossary), and may be used. The prohibition of genetically modified organisms applies to all organisms including trees. This Criterion is guided by FSC policy paper: GMOs: Genetically Modified Organisms: Interpretation for FSC Revised January, March, June, July, October 1999 *available at http://www.fsc.org/en/whats_new/documents/Docs_cent/2*

6.8.a. Exotic (i.e., non-indigenous), non-invasive predators or biological control agents are used only as part of a pest management strategy for the control of exotic species of plants, pathogens (see Glossary), insects, or other animals when alternative pest control methods are ineffective, or can reasonably be expected to be proven ineffective. Such use is contingent on peer-reviewed scientific evidence that the agents in question are non-invasive and are safe for indigenous species. (*For example,* exotic species can host pathogens that might diminish biodiversity in the forest.)

6.9 The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.

6.9.a Native, locally sourced planting stock is the first choice whenever it is available and suitable for the task and site.

Note: Non-invasive, exotic plant species may be used for erosion control and other purposes under limited circumstances, where alternative methods have proven ineffective and/or no native alternative is available. The use of such exotic plant species (see Glossary) is contingent on the following conditions:

- *Before an exotic is used, scientifically credible evidence must exist that the species in question is non-invasive and does not diminish biodiversity.*
- *The first priority is the active pursuit of non-exotic substitutes and/or development of alternative management strategies to avoid the need for use of exotics.*
- *If non-invasive, exotic plant species are used, their provenance and the location of their use are documented and their ecological effects are actively monitored.*

6.9.b. Invasive, exotic plants are not introduced or used**.**

6.9.c. Measures are developed and implemented for the prevention and control of invasive, exotic species that have become established in areas under management.

> *For example, vehicles are routinely cleaned to prevent the spread of seeds from invasive, exotic plants*

6.10. Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion:

a) entails a very limited portion of the forest management unit; and
b) does not occur on high conservation value forest areas; and
c) will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.

Please refer to note on Principle 10 on "application of this standard" in the introduction.

Note: *The Working Group considers this Criterion sufficiently explicit and measurable. Indicators are not required.*

PRINCIPLE #7: MANAGEMENT PLAN

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

Applicability Note: The management plan may consist of a variety of documents that are not necessarily unified into a single planning document but which represent an integrated strategy for managing the forest.

7.1The management plan and supporting documents shall provide:

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.

a. Management objectives

7.1.a.1. A clearly written management plan is prepared that includes the landowner's short-term (less than or equal to 10 years) and long-term (greater than or equal to 50 years) vision, goals, and objectives (ecological, silvicultural, social, and economic). The objectives are specific, achievable, and measurable. Appropriate to the scale, intensity, and context of management, the plan includes description and rationale for:

Silvicultural systems

- regeneration strategies
- maintenance of structural and species diversity

- pest control (disease, insects, invasive species, and vegetation)
- conservation of soil and water
- methods and annual rates of harvest by species and products
- requirements for equipment and personnel

Transportation system

Fire management

- prescribed fires
- wildfires

Fish and wildlife and their habitats (including non-game species)

Non-timber forest products (as applicable)

- methods and annual rates of harvest, by species and products
- regeneration strategies

Socioeconomic issues

- public access and use (as applicable)
- conservation of historical and cultural resources (as applicable)
- protection of aesthetic values
- employee and contractor policies and procedures
- community relations
- stakeholder notification (as applicable)
- public comment process (as applicable)

American Indian issues (as applicable)

- protection of legal and customary rights
- procedures for integrating tribal concerns in forest management
- management of sites of special significance

Special management areas (as applicable)

- riparian management zones
- set asides of samples of representative existing ecosystems
- sensitive, rare, threatened, and endangered species protection
- other protected areas

Landscape level analyses and strategies

Note: The above provides an overall checklist. Some of these issues may be covered more specifically below, and some, as noted, may not be applicable.

7.1.a.2. The rationale behind the forest management strategy and objectives is well documented and justified based on: site history; owner's objectives; forest condition; ecology; management needs; and other relevant factors.

b. Description of the forest resources to be managed

7.1.b.1. The management plan contains a statistically reliable inventory of the timber resource that includes information on the method of sampling and its reliability.

7.1.b.2. The prioritization of inventories reflects the relative risks to resources that are likely to result from proposed management activities, and the intensity of inventories reflects the heterogeneity of the resource as it relates to statistically valid sampling protocols.

7.1.b.3. At a minimum, there is a narrative description of forest types, understory vegetation, and non-timber resources, which include wildlife, water, and soils (see indicator 8.2.d).

7.1.b.4. The management plan includes a discussion of existing forest habitat types, their natural successional pathways, their disturbance regimes, and their status (e.g., common, rare) in a landscape context.

7.1.b.5. The management plan identifies relevant cultural and socioeconomic issues (e.g., traditional and customary rights of use, issues of access, recreational uses, and issues of employment), conditions (e.g., composition of the workforce, stability of employment, and changes in forest ownership and tenure), and areas of special significance (e.g., ceremonial and archeological sites).

Note: Details regarding culturally sensitive issues may be described in general terms to maintain confidentiality.

7.1.b.6. The management plan includes descriptions of the following elements: special management areas; sensitive, rare, threatened, and endangered species and their habitats; other ecologically sensitive features in the forest; and management regimes for these areas.

7.1.b.7. The management plan identifies the legal status of the forest and its resources (e.g., ownership, usufruct rights, treaty rights, easements, deed restrictions, and leasing arrangements).

Note: Details regarding culturally sensitive issues may be described in general terms to maintain confidentiality.

7.1.b.8. The management plan describes the strengths and limitations of the management unit relative to stated goals.

> *For example, with respect to timber production a management unit may be able to produce high quality, high value wood, but growth rates may be moderate.*

c. Description of the silvicultural and/or other management system(s)

7.1.c.1. Silvicultural system(s) are described and well-substantiated, based on existing data, the most up-to-date research, and the integration of ecological and economic characteristics (e.g., successional processes, soil characteristics, existing species composition and structures, desired future conditions, and market conditions).

7.1.c.2. Prescriptions that include the desired outcomes of management are prepared prior to harvesting, site preparation, pest control, burning, and planting and are made available to people who carry out the prescriptions.

d. Rationale for rate of annual harvest and species selection

7.1.d.1. Periodic allowable cut by area or volume is based on conservative and well-documented estimates of growth and yield, and the method of calculating the periodic allowable cut is detailed in the management plan.

7.1.d.2. Calculation of the long-term, periodic allowable cut explicitly accounts for the stochastic and potentially disruptive effects of potential outbreaks of pest insects, windthrow, drought, and fires based on the forest's known history.

7.1.d.3. The management plan includes a market analysis, appropriate to the scale and complexity of the operation.

e. Provisions for monitoring of forest growth and dynamics (see also Principle 8)

7.1.e.1. The management plan contains a detailed description of monitoring plans and procedures.

f. Environmental safeguards based on environmental assessments (see also Criterion 6.1)

f.1 Fire

7.1.f.1.a. The management plan addresses fire management, including:
- characterization of local fire regimes
- plans for prevention and suppression
- identification and treatment of high-hazard areas;
- smoke management
- if applicable, a discussion of prescribed fire as a tool for achieving resource-management objectives.

f.2 Pests

7.1.f.2.a. The management plan includes strategies to control pests that will be informed by up-to-date FSC policy (see also criterion 6.6). The pest control section:

- characterizes natural pest and invasive plant regimes for the locality;
- describes pest and invasive plant prevention and pathogen management strategies, (such as integrated pest and weed management), especially non-chemical ones, and
- describes how silvicultural systems will be used in an attempt to lower natural susceptibility and vulnerability of stands to pests by promoting stand structures that enhance complexes of natural biological control.

f.3 Environmental protection plan (also see various indicators under Criterion 6.3)

7.1.f.3.a. The management plan describes measures for environmental protection, including:
- conservation of soil
- protection of watersheds, wetlands, and riparian zones
- conservation of biodiversity
- use and handling of chemicals
- control of exotic species and noxious weeds
- road design and conservation structures

f.4. Restoration plan

7.1.f.4.a. The management plan addresses restoration of degraded streams and wetlands, forest stands and range sites, and the ecological rationale for restoration strategies.

f.5. Landscape-level plan

7.1.f.5.a. The plan addresses management of the ownership in a landscape context that includes the consideration of ecosystem functioning, wildlife corridors, and buffer zones.

g. Rare, threatened and endangered species (see also Criterion 6.2)

7.1.g.1. Management plans contain provisions to address endangered, threatened, rare, or uncommon species and suitable habitat (e.g., dens, protection of nesting or roosting trees with no-cut buffers, research conducted on biological requirements).

h. Maps describing the forest resource base

7.1.h.1. The management plan contains maps of the forest resource that include details on the following:

- forest types by size class
- habitat types
- stands
- size and location of timber production areas
- historic land uses, forest cover; topography
- geologically sensitive areas, such as steep slopes
- soils and water catchment areas
- riparian and wetland zones
- ecologically significant zones (TES Species) and unique features, such as archaeological sites
- property boundaries
- relevant landscape-level factors, including watersheds and off-site representative sample areas (see 6.4.g)
- cultural and customary-use areas
- designated High Conservation Value Forests.

7.1.h.2. Maps and work plans are produced at an adequate scale to provide operational guidance for management activities and to facilitate on-site monitoring.

7.1.h.3. The management plan contains a map and proposed schedule of access, development, and maintenance for all areas intended for management.

i. Description of harvesting techniques and equipment to be used. (see also standards under Criterion 6.5)

7.1.i.1. The management plan describes the rationale for harvesting machinery and techniques to be used in the context of existing conditions in the forest stand and landscape.

7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.2.a. Management plans are reviewed on a five-year basis and revised as appropriate (at least every ten years for large ownerships, and at least every fifteen years for small and medium-sized ownerships with less intensive management). Revisions address new research findings and socio-economic conditions, the observed effects of previous practices, and changes in the resource base due to wildfire, blowdown, epidemics, climate change, etc.

7.2.b. Indicators of progress relative to objectives are identified in the plan, and an effective plan for monitoring these indicators is in place. Records are maintained that detail the work undertaken to meet management objectives.

7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.

7.3.a. Forest workers demonstrate an understanding of the objectives and proposed techniques in the management plan that are relevant to their work.

7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

Applicability Note: Forest owners or managers of private forests may withhold proprietary information (e.g.., the nature and extent of their forest-resource base, marketing strategies, and other financial information, see also Criterion 8.5).

Note: The Working Group considers this Criterion sufficiently explicit and measurable. Indicators are not required.

PRINCIPLE #8: MONITORING AND ASSESSMENT

Monitoring shall be conducted -- appropriate to the scale and intensity of forest management-- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

Applicability Note: On small and medium-sized forests, an informal, qualitative assessment may be appropriate. On large forests and intensively managed forests, however, formal, quantitative monitoring is probably required.

8.1 The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.

8.1.a. Monitoring of forest management accurately measures and records the indicators that have been identified in the management plan; further, monitoring is regularly scheduled and documented in a scientifically credible manner, with periodic summaries produced that include information on:

- harvest yields
- growth
- flora and fauna
- environmental and social impacts
- water quality

8.1.b. Forest owners and managers monitor (i.e., observe and, where appropriate for record-keeping, document) the following, on an ongoing basis:

- extent and details of plan implementation.
- unexpected impacts of such operations.
- achievement of management goals and objectives

- deviations from the plan.
- social and environmental effects of management activities.

8.1.c. The impact of harvesting, including roads and site preparation, is assessed by using defined methods. Consistent methods are used both pre- and post-harvesting and are appropriate for the ecological sensitivity and complexity of the forest and the resources available to the forest manager.

8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators: a) Yield of all forest products harvested. b) Growth rates, regeneration and condition of the forest. c) Composition and observed changes in the flora and fauna. d) Environmental and social impacts of harvesting and other operations. e) Costs, productivity, and efficiency of forest management.

8.2.a. Written records are maintained of standing timber and harvest volumes by species and/or size.

8.2.b. Growth rates, regeneration, stand density and structure, composition, volume and mortality are monitored by use of a forest inventory system.

Note: Detailed ecological surveys are encouraged.

8.2.c. The occurrence, abundance, and condition of non-timber species are surveyed at a level of detail and intensity consistent with the ecological sensitivity of the site and the intensity of harvesting, when it occurs.

Note: Quantitative surveys are encouraged

8.2.d. At a minimum, surveys are conducted and written records are maintained of the following:

- quality and quantity of water resources (e.g., stream flow sedimentation, turbidity, pollution, temperature)
- soil conditions
- damage from (see indicator 8.1.c) natural disturbance and timber trespass
- supply and yield of non-timber forest products and services, if applicable
- vulnerability to fire and pests
- impacts to species at risk, including rare, threatened, and endangered species

Note: The level of detail and intensity of these inventories is appropriate to the scale and intensity of activities and is consistent with the level of ecological sensitivity of the site. Quantitative surveys are encouraged.

8.2.e. Productivity and efficiency are assessed through monitoring of costs and revenues of management.

8.2.f. A monitoring program is in place to assess the condition and environmental impacts of the road system.

8.2.g. Creation and/or maintenance of local jobs and public responses to management activities are monitored.

8.2.h. Sites of special significance identified in the plan are monitored to determine adequacy of the management prescriptions. Tribal sites (see indicators for Criteria 3.2 and 3.3) are jointly monitored with tribal representatives.

8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the "chain of custody."

8.3.a. When products are being sold as "certified," they are clearly identified as certified forest products through marks, labels, or separate storage during those stages that occur under the forest owner's or manager's control.

8.4 The results of monitoring shall be incorporated into the implementation and revision of the management plan.

8.4.a. The level and detail of information (e.g., condition of watersheds, soils, and species diversity) collected through monitoring enables appropriate adjustment of management practices, plans, and strategies.

8.4.b. Deficiencies in data and information are identified, and appropriate assessment and monitoring programs are instituted.

8.4.c. Discrepancies between outcomes (i.e. yields, growth, ecological changes) and expectations (i.e. plans, forecasts, anticipated impacts) are appraised and taken into account in preparing the next plan. Expert advice is sought when necessary.

8.5 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.

Applicability Note: Forest owners or managers of private forests may withhold proprietary information (e.g., timber volume by species, size, and age class; marketing strategies; and other financial information).

8.5.a.. An up-to-date summary of monitoring information is maintained and available upon request, either free or at a nominal price.

PRINCIPLE #9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS
Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

Applicability Note:
High Conservation Value Forests are those that possess one or more of the following attributes:
a) forest areas containing globally, regionally, or nationally significant concentrations of biodiversity (e.g., endemism, endangered species, refugia); such forests can also be large, landscape-level forests that are contained within, or themselves contain, the management unit, wherein viable populations of most, if not all, native species exist in natural patterns of distribution and abundance

b) forest areas that are either in or themselves contain rare, threatened, or endangered ecosystems
c) forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)
d) forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

9.1. Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.

Applicability Note: Small landowners that practice low-intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments (e.g., formal assessments by scientists) are expected by large landowners and/or those who practice more intensive forestry (see Glossary).

9.1.a. Attributes and locations of High Conservation Value Forests are determined by (see "applicability to old-growth" note in 6.3):

(1) identification of globally scaled HCVF attributes that may be present in the forest
(2) identification and description of regionally and locally scaled HCVF attributes and areas that may be present in the landscape and/or certified forest
(3) consultations with stakeholders and scientists
(4) public review of proposed HCVF attributes and areas
(5) integration of the information obtained from consultations and public review into the proposed HCVF delineations
(6) delineation by maps and habitat descriptions

9.2. The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof. (see also 9.1.a)

9.2.a. Consultations are held with stakeholders and scientists to confirm that proposed HCVF locations and their attributes have been accurately identified. On public forests, a transparent and accessible public review of proposed HCV attributes and HCVF areas is carried out. Information from stakeholder consultations and other public review is integrated into HCVF descriptions and delineations.

9.3. The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.

Applicability Note: The applicability of the precautionary principle and the consequent flexibility of forest management vary with the size, configuration, and tenure of the HCVF:

a) More flexibility is appropriate where HCV forest is less intact, larger in area, has a larger area-to-perimeter ratio, and its tenure is assured over the long term.
b) Less flexibility is appropriate where HCV forest is more intact, covers a smaller area, has a smaller area-to-perimeter ratio, and future tenure is uncertain based on social considerations, and is consistent with Principle 3.

9.3.a In intact old-growth forests (see Glossary and Appendix B) and un-entered old-growth stands (see Glossary and Appendix B), the precautionary principle requires that active management is conducted *only* when it is ecologically necessary to maintain or enhance HCVF values, or unless it is demonstrably compatible with these values. Tribal lands may be excepted from this provision.*

> *For example, maintenance of old-growth and HCVF attributes may be carried out by: (1) removal of exotic species, (2) use of controlled burning, or (3) thinning from below in dry forest types. Where restoration is appropriate; compatible uses may include ecotourism, collection of berries, etc.*

9.3.b Stands and forests designated as HCVFs, which have been entered for timber harvest, are managed over the long term to assure that both the quality of their HCVF attributes and their area are maintained.

9.3.c Forest owners and managers of HCVFs (forests and/or stands) coordinate conservation efforts with owners and managers of other HCVFs in their landscape.

9.4 Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain and enhance the applicable conservation attributes.

Note: The Working Group considers this Criterion sufficiently explicit and measurable. Indicators are not required.

PRINCIPLE # 10: PLANTATIONS

Plantations shall be planned and managed in accordance with Principles and Criteria 1 - 9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.1 The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.2 The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods, shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.3 Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.4 The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.5 A proportion of the overall forest management area, appropriate to the scale of the plantation and to be determined in regional standards, shall be managed so as to restore the site to a natural forest cover.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim

10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods

rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim.

10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.

Applicability note: Plantation systems are not currently employed in the Southwest.. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim.

10.9. Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly for such conversion.

Applicability note: Plantation systems are not currently employed in the Southwest. If plantation systems become operable in the Southwest, the issue of region-specific standards for Principle 10 will be re-visited by a regional working group. The FSC-US National Indicators V1.0 will be used for this Criterion during the interim.

Glossary

Terms Specific to the Southwest Region:

Words in this document are used as defined in most standard English language dictionaries. The precise meaning and local interpretation of certain phrases (such as local communities) should be decided in the local context by forest managers and certifiers. In this document, the words below are understood as follows:

Adverse possession: A method of acquiring title to real property by possession for a statutory period under certain conditions. Described as a statutory method of acquiring title to land by limitation. In order to establish title in this manner, there must be proof of non-permissive use, which is actual, open, notorious, exclusive and adverse for the statutorily prescribed period.

Bank: The sloping land bordering a channel (see Channel). The bank has steeper slope than the bottom of the channel and is usually steeper than the land surrounding the channel. A line running along a stream channel beyond which approximately 25% of the vegetation is perennial. (These definitions drawn from the USDA Forest Service Rocky Mountain Research Station and the Nevada Division of Water Planning).

Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems. (see Convention on Biological Diversity, 1992)

Biological diversity values: The intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components. (see Convention on Biological Diversity, 1992)

Biological control agents: Living organisms used to eliminate or regulate the population of other living organisms.

Buffer zone: In conjunction with core areas and corridors, areas that: 1) insulate core areas from hostile land use and ameliorating edge effects; 2) provide supplemental habitat and habitat linkages for some native species; 3) buffering intensively used human areas from depredating large mammals that reach relatively high densities in core areas; and 4) provide multiple use. Generally, management in buffer zones should be low-impact/low-intensity.

Chain of custody: The channel through which products are distributed from their origin in the forest to their end-use.

Channel: 1. *Watercourse* - A natural stream that conveys water, with definable bed and banks to confine and conduct flowing water. River, creek, run, branch, anabranch, and tributary are some of the terms used to describe natural channels, which may be single or braided. 2. *Landform* -The bed of a single or braided watercourse that commonly is barren of vegetation and is formed of modern alluvium. Channels may be enclosed by banks or splayed across and slightly mounded above a fan surface and include bars and dumps of cobbles and stones. (Drawn from Nevada Division of Water Planning)

Chemicals: The range of fertilizers, insecticides, fungicides, and hormones, which are used in forest management.

Core area: A reserve designed to protect particular species, habitats, forest types or other ecologically important features. Management activities within core areas should be conducted only to serve the purpose for which the core is set aside.

Corridor: An extension of a core area, which provides for dispersal and genetic interchange between two cores.

Criterion (pl. Criteria): A means of judging whether or not a Principle (of Forest Management) has been fulfilled.

Customary rights: Rights which result from a long series of habitual or customary actions, constantly repeated, which have, by such repetition and by uninterrupted acquiescence, acquired the force of a law within a geographical or sociological unit.

Ecosystem: A community of all plants and animals and their physical environment, functioning together as an interdependent unit.

Endangered species: A species officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as having its continued existence threatened over all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors.

Even-aged silviculture: Silvicultural systems producing stands consisting of trees of the same or nearly the same age. The term does not apply to "group selection harvests" which may create small patches generally up to a width two times the height of adjacent mature trees, in which small even-aged "groups" of trees may become established and grow.

Exotic species: An introduced species not native or endemic to the area in question.

Forest integrity: The composition, dynamics, functions and structural attributes of a natural forest.

Forest management/manager/owner: The people responsible for the operational management of the forest resource and of the enterprise, as well as the management system and structure, and the planning and field operations.

Genetically modified organisms: Biological organisms which have been induced by various means to consist of genetic structural changes.

High-grading: Removal of the most valuable timber from a stand in a manner bereft of any valid silvicultural intention.

Indigenous lands and territories: The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which indigenous peoples have traditionally owned or otherwise occupied or used. (Draft Declaration of the Rights of Indigenous Peoples: Part VI)

Indigenous peoples: "The existing descendants of the peoples who inhabited the present territory of a country wholly or partially at the time when persons of a different culture or ethnic origin arrived there from other parts of the world, overcame them and, by conquest, settlement, or other means reduced them to a non-dominant or colonial situation; who today live more in conformity with their particular social, economic and cultural customs and traditions than with the institutions of the country of which they now form a part, under State structure which incorporates mainly the national, social and cultural characteristics of other segments of the population which are predominant." (Working definition adopted by the UN Working Group on Indigenous Peoples).

Integrated pest or weed management: A pest or weed management strategy that focuses on long-term prevention or suppression of pest or weed problems through a combination of techniques such as encouraging biological control, use of resistant varieties, and adoption of alternate cultural practices to make the habitat less conducive to pest development. (Derived from University of California - Davis IPM glossary)

Landscape: A geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.

Local laws: Includes all legal norms given by organisms of government whose jurisdiction is less than the national level, such as departmental, municipal and customary norms.

Long term: The time-scale of the forest owner or manager as manifested by the objectives of the management plan, the rate of harvesting, and the commitment to maintain permanent forest cover. The length of time involved will vary according to the context and ecological conditions, and will be a function of how long it takes a given ecosystem to recover its natural structure and composition following harvesting or disturbance, or to produce mature or primary conditions.

Native species: A species that occurs naturally in the region; endemic to the area.

Natural cycles: Nutrient and mineral cycling as a result of interactions between soils, water, plants, and animals in forest environments that affect the ecological productivity of a given site.

Natural forest: Forest areas where most of the principal characteristics and key elements of native ecosystems such as complexity, structure and diversity are present, as defined by FSC- approved national and regional standards of forest management.

Non-timber forest products: All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products.

Other forest types: Forest areas that do not fit the criteria for plantation or natural forests and which are defined more specifically by FSC-approved national and regional standards of forest management.

Plantation: Tree-dominated vegetated area in which human intervention, through planting or intensive silvicultural treatments, has yielded conditions in which only a few of the characteristics of the indigenous natural forest ecosystem remain.

Primary forest: An ecosystem characterized by an abundance of mature trees, relatively undisturbed by human activity. Human impacts in such forest areas have normally been limited to low levels of hunting, fishing and harvesting of forest products, and, in some cases, to low density, shifting agriculture with prolonged fallow periods. Such ecosystems are also referred to as "mature," "old-growth" or "virgin" forests. (further details will be addressed by FSC-approved national and regional standards of forest management)

Principle: An essential rule or element; in the FSC's case, of forest management.

Riparian: The ecosystem encompassing a river and adjacent floodplain, dependent on both surface flows and shallow groundwater for seed dispersal, plant establishment and succession, nutrient cycling and productivity.

Secondary forest: The ecosystems that regenerate from a substantial disturbance (flood, fire, land clearing or extensive and intensive logging) characterized by a scarcity of mature trees and an abundance of pioneer species and a dense understory of saplings and herbaceous plants. Although secondary forests frequently peak in terms of biomass accumulation well-within one felling cycle, the transition to primary forests usually requires several rotation lengths, depending upon the severity of the original disturbance. Irreversible transformation of the underlying soil and nutrient cycle brought about by chronic or intense use may render it impossible for the original, primary forest type to return. (further details will be addressed by FSC-approved national and regional standards of forest management).

Silviculture: The art of producing and tending a forest by manipulating its establishment, composition and growth to best fulfill the objectives of the owner. This may, or may not, include timber production.

Succession: Progressive changes in species composition and forest community structure caused by natural processes (nonhuman) over time.

Tenure: Socially defined agreements held by individuals or groups, recognized by legal statutes or customary practice, regarding the "bundle of rights and duties" of ownership, holding, access and/or usage of a particular land unit or the associated resources there within (such as individual trees, plant species, water, minerals, etc).

Threatened species: Any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as defined by state and federal law.

Use rights: Rights for the use of forest resources that can be defined by local custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques.

Water body: Equivalent to "waters of the United States" as defined in 40 CFR 232.2 (q), including lakes, rivers, streams/intermittent streams (including arroyos, mudflats, sandflats, wetlands ("cienegas"), sloughs, potholes, wet meadows ("vegas"), playa lakes, or natural ponds; impoundments of waters; tributaries of these aforementioned waters; the territorial sea; and wetlands adjacent to waters.

Watercourse: A natural channel with definable banks that functions as an ephemeral stream (carrying occasional surface runoff) or intermittent stream (carrying occasional flow some component of which is groundwater-fed).

Wetland: An identifiable property, tract, area or region exhibiting one or more of the following characteristics:

- The substrate is predominantly undrained hydric soil (soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation).
- The area exhibits wetland hydrology (periodic inundation or soil saturation to the surface at some time during growing season, with the presence of water having an overriding influence on soil characteristics).
- The area supports, under normal conditions, a prevalence of hydrophytic vegetation plants adapted for life in saturated soil conditions).

Terms Specific to the National Indicators:

Allottee(s): Person(s) owning an Indian allotment. An Indian allotment is private land owned by one or more individuals (rather than a tribe) but held in trust by the federal government.

Age class: Intervals (commonly 10 years) into which the age range of a tree crop is divided; also the trees falling into such an interval.

Aquatic habitat: Habitat that occurs in free water (as opposed to water that is unavailable for habitat).

Buffer: A strip of vegetation that is left or managed to reduce the impact of a treatment or action of one area on another.

Canopy: The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Canopy closure: The progressive reduction of space between tree crowns as they spread laterally.

Community: A group of one or more populations of plants and animals in a common spatial arrangement; an ecological term used in a broad sense to include groups of various sizes and degrees of integration.

Community type: A generalized category comprising a number of similar units or stands of vegetation and including animal life.

Configuration: The shape or outline of a forest stand or plant community; the degree of irregularity in the edge between forest stands or communities; varying from simple to mosaic.

Credible scientific analyses: are defined as scientific opinions supported by data and explanations in articles published in peer-reviewed professional journals that deal with the natural or social sciences and judged to be relevant to the matter in question. Scientific credibility, as it applies to this criterion, is, based on a body of scientific work and on the judgment of experienced professionals.

Erosion: The displacement of soil from one place to another by any means; including water, wind, gravity, logging, and road building.

Even-aged management: A system of forest management in which stands are produced or maintained with relatively minor differences in age.

Exotic plant species: For the purpose of these standards, exotic plant species are those that meet one of the two following definitions:

1) they do not occur naturally in temperate or sub-tropical North America, *or*
2) they occur naturally in temperate or sub-tropical North America, but come from a forest category that is different from the certified forest. (Kuchler, A.W. 1975. Potential natural vegetation of the conterminous United States (map). Second edition. American Geographical Society. New York. [Scale: 1:3,168,000])

Kuchler has divided the nation's forests into six categories: Eastern needle, broad leaf and mixed forests; and Western needle, broad leaf and mixed forests. Needle leaf trees with a native range in eastern forest may be planted in eastern needle leaf and mixed forests. Broad leaf trees with a native range in eastern forests may be planted in eastern broad leaf and mixed forests. Needle leaf trees with a native range in western forests may be planted in western needle leaf and mixed forests. Broad leaf trees with a native range in western forests may be planted in western broad leaf and mixed forests.

Forest: (A) The property or portions of a property that is under certificate or being assessed for certification; the corresponding FSC International nomenclature is "Defined Forest Area." (B) Generally, an ecosystem characterized by tree cover; more particularly, a plant community predominantly of trees and other woody vegetation that is growing closely together.

Intact old-growth forest: A forest that is unroaded or lightly roaded, with no evidence of previous logging, and of sufficient size and configuration to maintain ecological integrity—500 acres or larger in size. Such forests differ from old-growth stands (see Glossary) in that they are not only rare but are also large enough to maintain significant biological diversity, genetic diversity, and a broad array of ecological functions on given acres through long periods of time.

Integrity: The state of being unimpaired; soundness; completeness; unity.

Intensive forestry: The practice of forestry to obtain a high level of volume of wood products per unit of area; accomplished through the application of the best techniques of silviculture and management.

Large forest: A forest that is at least 50,000 acres in size.

Managed forest: A forest that has been brought under management to accomplish specified objectives.

Mid-Sized Forest: A forest between 5000 and 50,000 acres in size.

Nutrient cycling: The circulation of elements, such as nitrogen and carbon, via specific pathways from abiotic to biotic portions of the environment and back again; all mineral and nutrient cycles involving human, animals, and plants—such as the carbon cycle, phosphorous cycle, and nitrogen cycle.

Pathogen: Any agent that causes disease, especially microorganisms, such as bacteria or fungi.

Plant community: A vegetative complex unique in its combination of plants; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site—such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax vegetation, such as ponderosa pine or bunchgrass, from which several plant community types may be derived on the basis of characteristic lesser vegetation.

Public land: Any land, including public forestland, held in government ownership in trust for the citizens of a city, county, state, or nation.

Rancheria: A small reservation, usually only a few acres, of a federally or state recognized Indian tribe. Also the legally recognized designation of the tribe, as in "Big Lagoon Rancheria."

Refugia: A small island of habitat in which a species can survive and from which it can disperse when the surrounding habitat becomes suitable for it to live in.

Restoration: The process of modifying a habitat or ecosystem to introduce or reintroduce composition, structures, and functions that are native to the site.

Riparian zone: An area identified by the presence of vegetation that requires free or unbound water or conditions more moist than normally found in the area.

Sediment: Material suspended in liquid or air; the deposition of that material onto the surface underlying this liquid or air.

Semi-natural forest: A forest ecosystem containing many of the characteristics of native ecosystems. Semi-natural forests exhibit a history of human disturbance (e.g., harvesting or other silvicultural activities) and make up a considerable percentage of the managed and unmanaged forestland in the Southeastern United States.

Slope: The incline of the land surface measured in degrees from the horizontal or in percent as determined by the number of units change in elevation per 100 of the same measurement units; also characterized by the compass direction in which it faces.

Small forest: . A forest less than or equal to 5,000 acres, except for the purposes of FSCUS's Family Forest Program (SLIMF) Streamlined Certification Procedures (FSC-POL-20-101 at http://www.fscus.org/documents/) under which a small forest is defined as less than or equal to 2,470 acres.

Snag: A standing dead tree from which the leaves and most of the limbs have fallen.

Soil: Earth material so modified by physical, chemical, and biological agents that it will support rooted plants (American Geological Institute 1962).

Species: A unit of classification on plants and animals consisting of the largest and most inclusive array of sexually reproducing and cross-fertilizing individuals that share a common gene pool; the most inclusive Mendelian population.

Species composition: The species that occur on a site or in a successional or vegetative stage of a plant community.

Stand: Plant communities, particularly of trees, sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguished from adjacent communities; also, may delineate a silvicultural or management entity.

Structural diversity: The diversity in a plant community resulting from the variety of physical forms of the plants within the community (such as the layering or tiering of the canopy of a forest from the ground-level to the tops of the tallest trees).

Unentered old-growth stand: A stand of trees that is unroaded or lightly roaded, with no evidence of previous logging, ranging in size from 15-500 acres, and of sufficient size and configuration to maintain specific ecological functions. Such stands differ from intact old-growth forests in that they are too small to maintain significant biological diversity and/or genetic diversity on given acres through long periods of time; but as a collective of variously sized acreages, contribute to a landscape-scale safety net in which a mosaic of biological diversity, genetic diversity, and ecological functions are maintained in space through various scales of time.

Water quality: The quality of water determined by a series of standard parameters—turbidity, temperature, bacterial count, pH, and dissolved oxygen.

Woody debris: All woody material, from whatever source, that is dead and lying on the forest floor.

Terms as defined in FSC International Principles and Criteria

High Conservation Value Forests: High Conservation Value Forests are those that possess one or more of the following attributes:
a) forest areas containing globally, regionally or nationally significant:
concentrations of biodiversity values (e.g., endemism, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
b) forest areas that are in or contain rare, threatened or endangered ecosystems
c) forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)
d) forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Precautionary approach: Tool for the implementation of the precautionary principle.

Appendix A.
Relevant International Treaties, and State and Local Laws

The following lists are provided to guide certifiers in the application of the regional standards, particularly in relation to FSC Principle 1. These lists are not exhaustive, and the included laws, treaties and other policies or regulations, are subject to change over time. Concerned parties should consult with appropriate agencies or private counsels. The lists do not include national laws, treaties, policies, agreements or regulations that are not region specific, as it is expected that certifiers operating in the United States will already be aware of the same.

INTERNATIONAL TREATIES AND AGREEMENTS TO WHICH THE US IS SIGNATORY

- Agenda 21, United Nations Convention on Environment & Development (UNCED), Rio de Janeiro, 1992
- Forest Principles, UNCED, 1992
- Convention on Biological Diversity, UNCED, 1992. (The US has signed the Treaty, but Congress has not ratified the signature).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Framework Convention on Climate Change, UNCED, 1992
- Various treaties with American Indian Nations, Tribes, and Bands in New Mexico, Arizona, Colorado and Utah.
- The Treaty of Guadalupe-Hidalgo.

ARIZONA

- Arizona Native Plants Protection Provisions A.R.S. Sec. 3-901 to 934
- Arizona Game and Fish Heritage Fund A.R.S. Sec. 17-296 to 298
- Arizona Air Quality Provisions A.R.S. Sec. 49-401 et seq.
- Conservation Easements A.R.S. Sec. 33-271 et seq.
- Holistic Resource Management Program A.R.S. Sec. 37-620 to 621
- Public Policy-Mgmt of Public Lands A.R.S. Sec. 37-902
- Citizen Suit Provision for violations of air and water quality standards and environmental nuisances A.R.S. Sec. 49-264, 49-407, 3-367
- Arizona Water Quality Provisions A.R.S. Sec. 49-201 et seq.
- Archeological Resources Provisions A.R.S. Sec. 41-841 et seq.
- Fire Practices (suppression of wildfires) A.R.S. Sec. 37-623
- Environmental Special Plates A.R.S. Sec. 28-2413
- Wildlife Violator Compact A.R.S. Sec. 17-501 et seq.
- Wildlife Habitat Protection A.R.S. Sec. 17-451 et seq.
- Wildlife Restoration Projects A.R.S. Sec. 17-401 et seq.
- Environmental Nuisance Provisions A.R.S. Sec. 49-141 et seq.
- Mining and Mineral Resource Provisions A.R.S. Sec. 27-101 et seq.

- State Parks Board Heritage Fund A.R.S. Sec. 5-522, 41-502
- River Compacts
- Various tax policies, including income tax, excise tax, severance tax, property tax, business and occupations tax, lottery monies, etc.
- Arizona does not have an endangered species law, however the Game and Fish provisions provide for civil liability for illegal taking and wounding of certain animals (A.R.S. Sec. 17-314)

UTAH

- Nonpoint Source Management Plan for Silvicultural Activities Utah
- Cultural Sites Protection Utah Code Sec. 76-6-901 to 903
- Archeological/Antiquities Statutes Utah Code Sec. 9-8-301 et seq.
- Fire Protection of Forests and Wildlands Utah Code Sec. 65A-8-1 et seq.
- Leaf-it-to-Us Children's Crusade for Trees Program Utah Code Sec. 65A-8-1.1
- Instream Flow Protection Utah Code Sec. 73-3-3
- Air Conservation Act Utah Code Sec. 19-2-103 et seq.
- Wildlife License Plates Utah Code Sec. 41-1a-408
- Wildlife Violator Compact Utah Code Sec. 23-25-1 et seq.
- Conservation Easement Act Utah Code Sec. 57-18-1 et seq.
- Water Quality Act Utah Code Sec. 19-5-103 et seq.
- Water Resource Policies Utah Code Sec. 73-10-10 et seq.
- Coal Mining & Reclamation Provisions Utah Code Sec. 40-10-2 et seq.
- Forest Preservation Const. Art. XVIII, Sec. I
- Heritage Trees Protection Provisions Utah Code Sec. 63-11-57 et seq.
- River Compacts
- Various tax policies, including tax check-offs, stamps, property tax, severance tax, funds, etc.
- Utah does not have an endangered species act
- Utah is aprox. 70% federally owned and cooperates heavily with the BLM and the US Forest Service

COLORADO

- Conservation Easements C.R.S.A. Sec. 38-30.5-101 et seq.
- Nongame, Endangered or Threatened Species Conservation Act C.R.S.A. Sec. 33-2-101
- Colorado Natural Areas Act C.R.S.A. Sec. 33-33-101 et seq.
- Archeology Provisions C.R.S.A. Sec. 24-80-401 et seq.
- Instream Flow Provisions C.R.S.A. Sec. 37-92-102
- Environmental Education Programs C.R.S.A. Sec. 24-33-109
- Colorado Land Use Act C.R.S.A. Sec. 24-65-101 et seq.
- Mines & Minerals Reclamation Permits C.R.S.A. Sec. 34-32-116
- Preservation of Forests-policy Const. 18, Sec. 6
- Fire Protection Provisions C.R.S.A. Sec. 13-21-105

- Fire Protection-suppression program C.R.S.A. Sec. 24-33.5-1204.5
- Colorado Water Quality Control Act C.R.S.A. Sec. 25-8-101 et seq.
- Oil & Gas Environmental Responsibility Fund C.R.S.A. Sec. 34-60-124
- Environmental Priority Plans C.R.S.A. Sec. 25-19-104
- State Planning Provisions C.R.S.A. Sec. 24-65.1-101 et seq.
- Air Pollution Prevention and Control Act C.R.S.A. Sec. 25-7-101 et seq.
- River Compacts
- Various tax policies, including income tax contributions (39-22-701 et seq.), severance tax, income tax, property tax, forest land tax, income assessment exemptions, etc.
- No Colorado state statute, but Costilla County has a Timber Harvest Ordinance.

NEW MEXICO

- Wildlife Conservation Act NMSA Sec. 17-2-37 et seq.
- Endangered Plant Species Act NMSA Sec. 75-6-1
- Habitat Protection Act NMSA Sec. 17-6-1
- Rangeland Protection Act NMSA Sec. 76-7B-1 et seq.
- Natural Lands Protection Act NMSA Sec. 75-5-1 et seq.
- Game & Fish Bond Act NMSA Sec. 17-1-16
- Natural Resources Trustee Act NMSA Sec. 75-7-1
- Land Use Easement Act NMSA Sec. 47-12-1 et seq.
- Air Quality Control Act NMSA Sec. 74-2-1 et seq.
- Environmental Improvement Act NMSA Sec. 74-1-1 et seq.
- Water Quality Act NMSA Sec. 74-6-1 et seq.
- Ground Water Protection Act NMSA Sec. 74-6B-1 et seq.
- Environmental Compliance Act NMSA Sec. 74-7-1 et seq.
- Forest Conservation Act NMSA Sec. 68-2-1 et seq.
- Forest Land Protection Revolving Fund NMSA Sec. 68-2-28
- Forest Land Policy NMSA Sec. 68-2-24
- Forest Fire Provisions NMSA Sec. 30-32-1 et seq.
- Logging operations-fire protection NMSA Sec. 68-1-2
- N.M. Forest Re-leaf Act NMSA Sec. 68-2-29 et seq.
- Public Policy-protection growing timber NMSA Sec. 68-1-1
- Resources Excise Tax Act NMSA Sec. 7-25-1 et seq.
- Timberlands Care and Protection Provisions NMSA Sec. 19-11-1 et seq.
- Cultural Properties Act NMSA Sec. 18-6-1 et seq.
- Prehistoric & Historic Sites Preservation Act NMSA Sec. 18-8-1 et seq.
- Severance Tax Act NMSA Sec. 7-26-1 et seq.
- Other tax provisions
- River Compacts
- County Land Use Codes
- New Mexico Forest Practice Guidelines
- Water Quality Protection Guidelines for Forestry Operations in New Mexico
- Rio Arriba County Timber Harvest Ordinance (adoption pending)

Appendix B:
References on Ecological Characteristics of Old-Growth

The following documents may provide guidance to certifiers in determining the presence of, or potential for, old-growth forest during assessments. The information provided in these documents should not be considered definitive, as better information continues to be developed on a more localized basis. Certifiers may wish to contact natural resource agencies and conservation organizations within the region to secure the most up-to-date information.

Mehl, Mel S. 1992 Old-Growth Descriptions for the Major Forest Cover Types in the Rocky Mountain Region. In: Kaufmann, M.R., W.H. Moir and R.L. Bassett, Tech Coords., Old Growth Forests in the Southwest and Rocky Mountain Regions: Proceedings of a workshop. USDA Forest Service General Technical Report RM-213. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colorado. pp. 106-120

Other papers included in GTR RM-213 also provide useful information on old-growth in the region

Southwestern Region Old-Growth Core Team. 1992. Recommended Old-Growth Definitions and Descriptions and Old-Growth Allocation Procedure. USDA Forest Service Southwestern Region. 53 pp.

San Juan National Forest Old Growth Score Card Rating System. 1997. Available from San Juan National Forest. Contact Laura Stansky at 970-385-1216.

Hamilton, Ronald G. 1993. Characteristics of Old-Growth Forests in the Intermountain Region. USDA Forest Service Intermountain Region. Ogden, Utah. 86 pp.

This document contains information on old-growth in southern Utah

Appendix C:
Southwest Regional Standards Working Group: Composition by FSC-Designated Chamber

Social Chamber

Jeanette Cassa*
San Carlos Apache Tribe

Jon Martin
BIA-Navajo Nation Forestry

Dave Nimkin
Confluence Associates

John Souter*
Northern Arizona University
Native American Forestry Program

Art Goodtimes
San Miguel County Commission, CO

Steve Harrington
Forest Trust

Carla Garrison*
Ponderosa Pine Project

Jan-Willem Jansens**
Common Ground

Economic Chamber

Barry Johnson*
USDA Forest Service

Lane Krahl*
Forest Economist

Phil Schwolert
Colorado State Forestry

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*=dropped out during or after first iteration of the regional standard
** =joined process for second iteration of the regional standard.

Ray Wrobley
SEC, Inc.

Jim Hamm*
Trees Are Us

Marco Lowenstein
Plaza Hardwoods,
SmartWood Program

Jeb Binkley*
Private Landowner

Rob Mrowka**
USDA Forest Service (participated as a private individual)

Barry Rhea
Rhea Environmental Consulting

Craig Wilcox
San Carlos Apache Tribe Forest Manager

Jim Webb**
Private consultant, former USDA National Forest Supervisor

Environmental Chamber

Greg Pollak
Santa Fe Forest Watch

Dan Randolph*
Living Land Research
Western Colorado Congress

Todd Schulke
Southwest Forest Alliance

Paige Morgan
Private Consultant - Hydrologist

*=dropped out during or after first iteration of the regional standard
**=joined process for second iteration of the regional standard.

Dave Schen
Utah Division of Forestry

Laura McCarthy
Hawkwatch International/
Forest Trust

Ernie Kurmes*/John Bailey**
Northern Arizona University
School of Forestry (Silviculture)

David Henderson*
National Audubon Society

Invited peer reviewers who provided input:

- Bureau of Indian Affairs
- Hannah Cortner, Univeristy of Arizona
- Dr. Robert Hrubes, affiliated with Scientific Certification Systems
- Dr. Dennis Lynch, Colorado State University, consultant to Colorado State Forestry and USDA Forest Service
- SmartWood Program
- Seth Pilsk, San Carlos Apache Tribe
- Dr. Bill Romme, Fire Ecology, Ft. Lewis College
- Hugh Thompson, Sup. Dixie National Forest
- Southwest Forest Alliance
- Reed Noss and Dominick DellaSalla, World Wildlife Fund
- Len Lankford, private forestry consultant, Colorado

NOTE: a larger pool of experts was invited to provide input - these are those who submitted comment.

**=joined process for second iteration of the regional standard.
*=dropped out during or after first iteration of the regional standard

Appendix D
References for Information on Threatened, Endangered, Sensitive and Rare Species and Communities

The following agencies or documents may provide guidance to certifiers in determining the presence of, or potential for, threatened, endangered, sensitive or rare species and communities during assessments. The information provided in these documents should not be considered definitive, as better information continues to be developed on a more localized basis. Lists are subject to periodic revision through time, with species and communities being added or removed. Certifiers may wish to contact natural resource agencies and conservation organizations within the region to secure the most up-to-date information.

State and Tribal Natural Heritage Databases

Utah Natural Heritage Program
Division of Wildlife Resources
1596 West North Temple
Salt Lake City UT 84116
801-538-4763 / 4709 fx
Contact: Ben Franklin

USDA Forest Service in Utah is currently updating their lists for TES species. This information will be incorporated into the state database. The Forest Service contact person is Theresa Prendusi. Ms. Prendusi can be reached at 801-625-5522.

Arizona Heritage Data Management System
Arizona Game & Fish Department
WM-H
2221 W. Greenway Rd.
Phoenix AZ 85023
602-789-3612 / 3928 fx
email: hdms@gf.state.az.us, hdms1@gf.state.az.us

Colorado Natural Heritage Program
Colorado State University
254 General Services Building
Fort Collins CO 80523
970-491-1309 / 3349 fx
Contact Chris Pague, Director, at 970-491-1150
email: cpague@lamar.colostate.edu

The Colorado database can be accessed on the internet at http://www.colostate.edu/orgs/cnhp/docs/splist.html

Navajo Natural Heritage Program

PO Box 1480
Window Rock, Navajo Nation, AZ 86515
520-871-7603 / 7069 fx

The Navajo database can be accessed on the internet at http://www.abi.org/nhp/us/navajo/#1

New Mexico Natural Heritage Program
University of New Mexico
Department of Biology
851 University SE, Suite 101
Albuquerque NM 87131
505-272-3545 / 3544 fx
Contact Marilyn Altenbach, ext. 231

The New Mexico database can be accessed on the internet at http://nmnhp.unm.edu

Biota Information System of New Mexico (BISON-M)
New Mexico Department of Game & Fish
Conservation Services Division
PO Box 25112
Santa Fe NM 87504
505-827-9912 / 9956 fx
Contact: Jon Klingel

The BISON-M database can be accessed on the internet at http://www.fw.vt.edu/fishex/states/nm.htm

World Wildlife Fund's Forest Communities of Highest Conservation Concern
World Wildlife Fund
1250 Twenty-Fourth St. , NW
Washington DC 20037-1175
202-293-4800 / 9211 fx
Contact: Dominick DellaSala

Forest communities are included based on significant declines in extent or quality since European settlement or extreme rarity due to other reasons. Forest communities are grouped by ecoregion, as recognized by WWF (i.e., not all ecoregions below are considered "forest ecoregions"); a given forest community often occurs in more than one ecoregion. The WWF biological distinctiveness and conservation status rankings are given for each ecoregion. Data on status of forest communities are from a review of endangered ecosystems in the U.S. published by the National Biological Service (NBS), a compilation of rare plant communities in the U.S. published by The Nature Conservancy (TNC), and other sources. Forest communities quaify for the list if they have declined in area by at least 70% since European settlement, have been severely degraded ij qaulity over at least 70% of their original area, or the community isd ranked as critically imperilled (G1)or

imperilled (G2) globally by TNC. The status of each community, according to TNC, or NBS, is given. For NBS status, CE= critically endangered (>98% decline), E= endangered (85-98% decline), and T= threatened (70-84% decline).

The following Southwestern communities are currently included in the list:

Arizona Mountains Forests (#46)
Biological Distinctiveness Value: Regionally Outstanding
Conservation Status: Relatively Stable
Old-growth and primary forests of all types (E)
Arizona Cypress/Shrub Live Oak Forest (G2)
Pinyon Pine/Pine Muhly Woodland (G2)
All native riparian forests (T)

Colorado Plateau Shrublands (#78)
Biological Distinctiveness Value: Regionally Outstanding
Conservation Status: N/A
Old-growth and primary forests of all types (E)
Box Elder-Narrowleaf Cottonwood/Redosier Dogwood Forest (G2)
Fremont Cottonwood Forest (G2)
Rio Grand Cottonwood/Skunkbrush Woodland (G2)
All native riparian forests (T)

Sonoran Desert (#80)
Biological Distinctiveness Value: Globally Outstanding
Conservation Status: N/A
All native riparian forests (T)

Colorado Rockies Forests (#45)
Biological Distinctiveness Value: Bioregionally Outstanding
Conservation Status: Relatively Stable
Old-growth and primary forests of all types (E)
White Fir-Colorado Blue Spruce-Narrowleaf Cottonwood/Rocky Mountain Maple Forest (G1)
Engelmann Spruce/Unita Clover Forest (G2)
Colorado Blue Spruce/Black Twinberry Forest (G2)
Quaking Aspen/Rocky Mountain Maple Forest (G1G2)
Quaking Aspen/Gooseberry Currant Forest (G2)
Colorado Blue Spruce/Thinleaf Alder Woodland (G2)
Rocky Mountain Bristlecone Pine/ Unita Clover Forest (G2)
Narrowleaf Cottonwood- Colorado Blue Spruce/Thinleaf Alder Woodland (G2)
Ponderosa Pine/Mountain Mahogany/Big Bluestem Sparse Woodland (G2)
Mature native riparian forests of all types (T)

Chihuahan Desert (#81)
Biological Distinctiveness Value: Globally Outstanding

Conservation Status: N/A
Old-growth and primary forests of all types (E)
Fremont Cottonwood Forest (G2)
Fremont Cottonwood /Deergrass Sparse Woodland (G2)
Fremont Cottonwood-Gooding Willow Woodland (G2)
Gooding Willow-Velvet Ash Woodland (G2)
Arizona Cypress/Shrub Live Oak Forest (G2)
Arizona Sycamore-Arizona Black Walnut Forest (G2)
Douglas-fir/Netleaf Oak Forest (G2)
Border Pinyon/Gambel Oak Woodland (G1)
Emory Oak/Sand Dropseed Woodland (G2)
All native riparian forests (T)

Madrean Sky Islands Forests (#47)
Biological Distinctiveness Value: Globally Outstanding
Conservation Status: Relatively Stable
Old-growth and primary forests of all types (E)
Douglas-fir/Netleaf Oak Forest (G2)
All native riparian forests (T)

Wasatch and Unita Montane Forests (#44)
Biological Distinctiveness Value: Bioregionally Outstanding
Conservation Status: Endangered
Old-growth and primary forests of all types (E)
Mature native riparian forests of all types (T)