Revised Final
Forest Stewardship Standard

for the

Rocky Mountain Region (USA)
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11/15/04

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INTRODUCTION TO THE ROCKY MOUNTAIN STANDARDS

Rocky Mountain Working Group, Forest Stewardship Council, U.S. Initiative

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REGIONAL CONTEXT – The U.S. Initiative of the Forest Stewardship Council has delineated 11 geographic regions in the United States. The Rocky Mountain Region encompasses some or all of the counties in the states of Montana, Idaho, Wyoming, Nevada, northern Colorado, northern Utah, and western South Dakota as more fully described in appendix 1. It is a mountainous and highly diverse forested region with significant conservation values. For example, this may be the only region in the Lower 48 with a full complement of the native species that occurred here 200 years ago. Forested areas are critically important for watershed functions, and recreational amenities in the region are high. Forest types range from wet and highly productive cedar-hemlock types to vast expanses of semi-moist lodgepole pine types to dry ponderosa pine types. By and large, the region's forests are slower growing and less productive than most other forested regions in the United States. The region's forests have been affected to various degrees over the past 100 years by fire exclusion and high-grade logging of large-diameter, fire-resistant, mid-seral species trees, and many natural fire regimes are "out of whack." Road management is an often-controversial subject. Logging levels in the region have diminished over the past decade due to shifting management priorities on public lands and reduced inventories of merchantable stock on large industrial holdings. The region is characterized by natural and semi-natural forests, with few plantations. Land tenure in the region at this time is relatively secure and non-controversial, including tribal rights and jurisdiction on forested lands.

APPLICABILITY TO LAND OWNERSHIP TYPE- The U.S. national indicators, approved by the FSC-U.S. Board as baseline standards for the development of all nine FSC-U.S. regional standards, (see www.fscus.org) are considered by the U.S Standards Committee to exemplify sufficient scientific and technical rigor to be applied to assessments of private, municipal, county, tribal, state and federal lands that are conducted by accredited certifiers in the continental United States, though the Committee recognizes that public lands may require additional indicators of performance due to their particular public mandates. .
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/.

In September 1998, the FSC-U.S. Board adopted as its position a recommendation that certifiers refrain from issuing certificates on federal lands in the United States until such time as three critical thresholds were met (see the preface of the FSC-U.S. National Indicators [pdf file] on www.fscus.org for more detail).

The FSC-U.S. Board has designated a Federal Lands Committee that has been directed to review and report to the Board on issues regarding federal land certification. If and when the above-mentioned thresholds are met, and/or the Board approves a new policy

allowing federal land certifications to proceed, the Rocky Mountain standards may be amended accordingly.

WORKING GROUP SELECTION: In spring 1998, FSC-U.S. contracted with Montana natural resource consultant Steve Thompson to recruit and coordinate a regional working group to develop certification standards for the Rocky Mountain Region. A multi-stakeholder regional working group was formed through a variety of means. Two dozen individuals from four inter-mountain states applied, and all were invited to participate in the regional working group. Applicants represented a broad range of environmental, social and economic interests.

WORKING GROUP ACTIVITIES: The working group has met a total of 14 days on six occasions, split about evenly between full committee and subcommittee meetings with some field trips. A drafting committee of the working group met for two days in March 2001 to complete the final draft. There have been extensive electronic and telephonic communications between working group members. Participation by the working group has consistently been around 85 percent at each meeting.

PUBLIC OUTREACH: In March 1998, Thompson organized a series of public information presentations in Salt Lake City, Boise and Missoula by convening a panel representing FSC-US, the two U.S. certifiers, an environmental group, and the manager of a large certified forest. After formation of the working group, coordinator Thompson and several working group members gave presentations about FSC to a dozen varied audiences, primarily landowner and forest management groups, in Idaho, Wyoming, Montana and Colorado. Many of these events included media coverage. A database of interested individuals was developed, and individuals were kept apprised of working group activities.

PROCESS: Using guidelines provided by FSC, the working group completed five drafts of the regional standards. Two drafts were submitted for public review and comment in spring 1999 and spring 2001. A field test of the standards was completed in July 1999 with the assistance of certifiers representing SmartWood and Scientific Certification Systems. Public comments and the field test were used to revise early drafts of the standards. The working group and drafting committee operated on the basis of consensus.

The working group will remain constituted for future revisions. The standards will be revised as necessary in response to new scientific information and/or changes in social-environmental circumstances. A review-and-revision process will be initiated no less than three years following approval by FSC-A.C. FSC-US will maintain a regional working group coordinator in the Rocky Mountain region.

APPLICATION OF STANDARDS: Recognizing that these standards are a tool that must be applied with professional discretion by certifiers, the working group elected not to establish any "fatal flaw" standards, preferring that certifiers evaluate the cumulative weight of adherence to the overall body of standards. The standards seek to

establish a rigorous performance bar that forest managers must clear to be certified, while also providing certifiers sufficient flexibility to exercise professional judgment.

Where scale and intensity are not explicitly mentioned in these standards**,** it is nevertheless always recognized that small or less-intensive operations may not be able to (or need to) meet the same level of rigor or compliance expected of larger or more intensive forest management operations.

Where no indicators are provided, the relevant criterion is considered to be sufficiently specific to be directly assessed in the field.

HARMONIZATION: Regional coordinator Steve Thompson participated in three national harmonization meetings in Vermont and Minnesota. The July 1999 field test was led by certifiers from SmartWood and SCS, who provided oral and written feedback on the draft standards. FSC-US Standards Committee Chairman Bill Wilkinson and FSC-British Columbia Standards Coordinator Marty Horswill attended the May 2000 meeting. Wilkinson and Ben Addlestone, FSC forester, also attended the March 2001 meeting of the drafting committee. The regional working group provided input into development of the FSC National Indicators; conversely, the drafting committee worked closely with the FSC-US Standards Committee on development of drafts #3, #4, and #5 of the regional standards.

A harmonization protocol between FSC US and FSC Canada was sent to the FSC ABU on October 12, 2004. This harmonization protocol is dated October 01, 2004, and has been signed by the President of FSC US and the Executive Director of FSC Canada.

Revised Final - FSC-US Rocky Mountain Regional Standards

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. 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 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 (see Glossary) management plans and operations comply with federal, state, county, municipal, and tribal laws, case law, and regulations.

1.1.b. Forestry operations meet or exceed the current state 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.

1.1.c. Forest owners or managers share public information, provide open records, and conduct public participation procedures as required by law.

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

1.2.a. Taxes on forestland and timber, and other fees related to forest management, are paid in a timely manner and in accordance with 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***:** *For the purposes of FSC certification, compliance with all federal and local laws and the FSC Principles, Criteria and Regional Standards indicates adherence to applicable international agreements to which the United States is a signatory nation.*

1.3.a. Forest owners or managers comply with treaties ratified by the U.S. Senate, including treaties with American Indian tribes.

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.

1.4.a. Where discrepancies between laws and FSC Principles and Criteria occur, they are referred to the appropriate FSC body.

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 in the forest.

For example, efforts may include posting boundary notices, using gates, making periodic inspections, and reporting suspected illegal or unauthorized activities to the proper authorities.

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

1.6.a. Where opportunities afford, FSC Principles and Criteria are explicitly supported in the public arena.

For example:

The management plan explicitly endorses FSC Principles and Criteria.
Forest owners and managers support the FSC Principles and Criteria through public presentations
Forest managers seeking partial certification pursue certification on all of their forested land, when feasible, over a reasonable period of time

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

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 and managers provide the certifier with evidence of long-term tenure and use rights to the forest ownership held by any party.

2.1.b. Relevant 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.

Applicability note: Provisions of this criterion shall not abridge or compromise the legal rights of private property owners.

2.2.a. The forest owner or manager allows well-established customary and lawful uses of the forest to the extent that they are consistent with the conservation of the forest resource and the objectives as stated in the management plan.

For example:

Hiking, hunting, and fishing on non-posted property
Visiting ancestral gravesites

2.2.b. On ownerships where customary use rights and traditional and cultural areas/sites exist, forest owners or managers consult with concerned groups in the planning and implementation of forest management activities.

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.

2.3.a. The forest owner or 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. If negotiation fails, federal, state, local, and/or tribal laws are employed to resolve land tenure (see Glossary) claims.

2.3.b. The forest owner or manager provides information regarding unresolved and ongoing disputes over tenure and use rights to the certifying body.

PRINCIPLE #3: INDIGENOUS PEOPLE'S 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, nations, native corporations, 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.

Note: The degree of consultation or informed consent required for traditional tribal territories is related to the degree of occupation and/or use of those lands and territories.

3.1.a. Forest management planning on tribal lands includes a process for input by tribal members in accordance with their laws and customs.

3.1.b. Forest management on tribal lands takes place only after securing the informed consent of tribes or individuals (such as allottees (see Glossary)) whose forest is being considered for management.

3.1.c. Forest owners or managers utilize tribal experience, knowledge, practices, and insights in forest management planning and operations on tribal lands, when requested to do so by the tribal landowner.

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 or managers identify and contact American Indian groups that have current legal or customary use-rights to the management area, and invite their participation in jointly planning forestry operations that affect their resources.

3.2.b. On lands adjacent to tribal lands or falling within watersheds that affect tribal lands, steps are taken to ensure that forest management does not adversely affect tribal resources.

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 request the participation of tribal representatives in identification of sites of current or traditional significance within the property proposed for certification.

For example, areas of special significance may include:

- *ceremonial, burial, or village sites*
- *areas used for hunting, fishing, or trapping*
- *current gathering areas for culturally important or ceremonial materials, such as basket materials, medicinal plants, or plant materials used in dances*
- *current gathering areas for subsistence uses, such as mushrooms, berries, acorns, etc.*

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

3.3.c. Confidentiality of disclosures 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 is formally agreed upon with their free and informed consent before forest operations commence.

3.4.a. Forest owners or managers respect the confidentiality of tribal knowledge and assist in the protection of tribal intellectual property rights.

3.4.b. Where indigenous intellectual property and forest products are commercially exploited, a written agreement with individuals and/or tribes is reached prior to commercialization.

3.4.c. When traditional ecological knowledge is requested for use in forest management, protocols are jointly developed with local tribes to protect the intellectual property rights of those tribes.

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. Employment conditions (e.g., remuneration, benefits, safety equipment, training, and workman's compensation) for non-local workers are equivalent to those for local workers doing the same job.

4.1.b. Forest owners or managers utilize qualified local foresters, loggers and contractors. Forest managers and their contractors give preference to qualified local workers.

4.1.c. Forest owners or managers attempt to procure goods and services locally.

4.1.d. Forest owners or managers participate in community development and civic activities.

4.1.e. Forest owners or managers contribute to public education about forestry practices in conjunction with schools, community colleges, and/or other providers of training and education.

For example:

- *Forests are offered as a training and/or educational resource.*
- *Forest owners or managers make presentations about responsible forestry in local schools.*

4.1.f. Employee compensation and hiring practices meet or exceed the prevailing local norms for work requiring equivalent education, skills, and experience.

4.1.g. Forest owners or managers provide and/or support training opportunities for workers to improve their skills.

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. The forest owner or manager and their contractors develop and implement safety programs and procedures that include:

- Well-maintained and safe machinery and equipment
- Use of safety equipment appropriate to each task
- Documentation and posting of safety procedures in the workplace
- Educational efforts (such as Forest Industry Safety Training Alliance and Game of Logging)
- Contracts with safety requirements
- Safety records, training reports, and certificates

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 Labor Organization (ILO).

4.3.a. Forest owners or managers and their contractors develop effective and culturally sensitive mechanisms to resolve disputes between workers and management.

Examples of culturally sensitive mechanisms are:

- *Translation and cultural interpretation, when needed*
- *Cross cultural training, when needed to integrate the workforce*

4.3.b. Forest workers are free to associate with other workers for the purpose of advocating for their own employment interests.

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

For example, quality work can include the following attributes:

- *Employee and contractor relationships that are long term and stable*
- *A mixture of diverse tasks requiring varying skill levels*
- *Opportunities for advancement*
- *A comprehensive package of benefits*
- *Opportunities for employee and contractor participation in decision-making*

4.3.d. Forest owners or managers and their contractors comply with the letter and intent of applicable state and federal laws and regulations (see also 1.1.a)

For example:

- *Employees are not discriminated against because of gender, race, religion, age, and disability with regards to hiring, dismissal, remuneration, and other employment conditions.*
- *People who work as employees are classified as employees, and not as contractors.*

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 or managers contribute to designing and achieving goals for forest and natural resource use and protection as articulated in local and regional plans.

4.4.b. Forest owners or managers provide opportunities for people and groups affected by management operations to provide input into management planning.

4.4.c. People and groups affected by management operations are apprised of proposed forestry activities (e.g., logging, burning, spraying, and traffic) and associated environmental and aesthetic effects in order to solicit their comments or concerns. Significant concerns are addressed in management policies and plans.

4.4.d. Significant archeological sites and sites of cultural, historical, or community significance, as identified through consultation with state archeological offices, tribes, universities, and local experts, are designated as special management zones or otherwise protected during harvest operations.

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 livelihood of local peoples. Measures shall be undertaken to avoid such loss or damage.

Applicability Note: Provisions of Criterion 4.5. do not evoke protections or liabilities beyond those provided by U.S., state, and local laws.

4.5.a. The forest owner or manager attempts to resolve grievances and mitigate damage resulting from forest management activities through open communication and negotiation prior to legal action.

4.5.b. Forest owners or managers and their contractors have adequate liability insurance.

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. The forest owner or manager is financially able to support long-term (i.e., decades rather than quarter-years or years) forest management, e.g., planning, inventory, resource protection, post-harvest management activities.

5.1.b. Responses (for example, 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.

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

5.1.d. The forest owner or manager reinvests in the local economy and the community through both active civic engagement and ongoing capital investment.

For example:

- *Facilities and equipment are regularly maintained and updated.*
- *Out-of-area owners maintain a local office.*
- *The owner or manager supports local business development by working with local economic development organizations*

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. Preference is given to local, financially competitive, value-added processing and manufacturing facilities.

5.2.b. New markets are explored and developed for common but less-used species, grades of lumber, or an expanded diversity of forest products.

5.2.c. The technical and financial specifications of some sales of forest products are scaled to allow successful competition by small businesses.

5.2.d. When non-timber products are harvested, the management and use of those products (*e.g. mushrooms, huckleberries*) are incorporated into the management strategy.

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

Applicability note: Basic components of forest structure, such as large down woody debris and large sound snags, rather than waste, are reinvestments of biological capital into the forest soil and habitat.

5.3.a. Felling, skidding/yarding, bucking, sorting, and handling are carried out in a way that meets high utilization standards while also providing for retention of snags, coarse woody debris, and nutrients.

5.3.b. Harvest is implemented in a way that protects the integrity of the residual stand. Provisions concerning acceptable levels of residual damage are included in operational contracts.

> *For example, bumper trees are utilized and equipment is selected and used in a way that minimizes unintentional damage to crop trees.*

5.3.c. After adequate woody debris has been left on site to provide nutrient cycling and habitat, additional byproducts of harvest and in-the-field milling operations are used as an input in other productive processes.

> *For example:*
> - *Chips and sawdust are used for mulch, filler, or fuel.*
> - *Small diameter boles are for used for fence posts, flooring, furniture stock and pulp.*

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

5.4.a. Management diversifies forest uses and products, while maintaining forest composition, structures, and functions.

> *For example, compatible uses may include recreation, ecotourism, hunting, fishing, and specialty products.*

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

5.5.a. Forest managers or owners maintain or enhance the inherent benefits and services that forests provide, including watershed protection, habitat diversity and other ecological functions identified under criteria 6.3 and 6.5. Managers use local expertise and the best available science.

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

5.6.a. Harvest volumes remain within the periodic allowable cut and the long-run sustainable yield (LRSY) as established in the forest plan. (See LRSY in the glossary; also 7.1.d.)

5.6.b. Standing inventory (total stocking and distribution of stocking throughout the forest in terms of tree species and size classes, health and vigor, stand structure and growing conditions) and actual growth rates are sufficient to maintain the LRSY.

5.6.c. If, due to historical circumstances, inventory and/or growth rates are not sufficient to maintain the LRSY, the harvest rate is restricted to that which will produce compliance as soon as reasonably possible.

5.6.d. In response to the results of inventory and monitoring procedures described under P.8, harvest rates are adjusted as necessary to assure compliance with standards 5.6.a-c.

Note: See also indicator 7.1.d. regarding the establishment of a periodic allowable cut level during a given management period.

PRINCIPLE #6: ENVIRONMENTAL IMPACT
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 that practice low intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments are expected by large landowners and/or those who practice more intensive forestry (see Glossary) management.

6.1 Assessment of environmental impacts shall be completed -- appropriate to the scale, 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) unique, vulnerable, rare, and threatened 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; (6) soil resources and (7) documented and projected impacts of environmental change, such as climate shifts or the effects of exotic pathogens (e.g., white pine blister rust.). (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 within the landscape context, using the baseline factors identified in 6.1.a.

6.1.c. Prior to the commencement of management activities, potential short-term environmental impacts and their cumulative effects are evaluated.

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).

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.

6.2.a. If state or federal listings and natural heritage program databases indicate the likely presence of a sensitive, rare, threatened, or endangered species, 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 is present. If a sensitive, rare, threatened, or endangered species is determined to be present, its location is reported to the manager of the species database.

6.2.b. When a sensitive, rare, threatened, or endangered species is present or assumed to be present, modifications are made in both the management plan and its implementation to maintain, improve, or restore (see Glossary) the species and its habitat.

6.2.c. When a sensitive, rare, threatened, or endangered species are present or assumed to be present, conservation zones are designated within which maintenance and/or restoration of such species and their habitat are the highest priority. Timber harvesting and other uses are allowed within conservation zones if they don't degrade the habitat or if they enhance it. When timber harvesting and other activities are not compatible with protection of such species, protection zones are designated within which incompatible activities are not allowed.

6.2.d. Conservation zones and protection areas are linked to foster connectivity of habitats within the context of existing landscape and ownership patterns.

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 lower 48 states, they are normally designated as High Conservation Value Forests (see Principle 9).

Certified old-growth forests, <u>not</u> designated as High Conservation Value Forest, are managed to maintain or recruit: (1) the existing abundance of old-growth trees and (2) the landscape and stand-level structures of old-growth forests, consistent with the composition and structures produced by natural processes. Limited timber harvest is permissible, provided these characteristics are retained or enhanced.

NOTE: See definition of old-growth forest in glossary.

6.3.a. Forest regeneration and succession

Applicability note: Even-aged management that complies with 6.3.a.4 and 6.3.a.5 below does not include clearcutting (the complete removal of trees from the harvest unit), as it does not emulate natural disturbances.

6.3.a.1. Management decisions, silvicultural systems and regeneration methods are compatible with natural disturbance regimes, site characteristics, and landscape patterns.

6.3.a.2. Consistent with management objectives and natural patterns of stand regeneration, forest management maintains and/or restores a range of age classes, including large/old trees, as well as a diversity of native plants, at both the landscape and stand levels.

6.3.a.3. Silvicultural practices provide disturbances and generate stand conditions that result in a successional phase that is typical of natural disturbance regimes on that site.

6.3.a.4. Even-aged management (see Glossary) is used as a silvicultural method only when it is ecologically appropriate to the forest type (e.g. in lodgepole or aspen types), or when human activity (e.g. highgrading, fire exclusion or introduction of exotics), has created an imbalance in the natural disturbance regime that can be remedied only by this method.

6.3.a.5. When even-aged management 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, unless retention at a lower level is necessary for restoration or rehabilitation purposes. The level of retention increases proportionally to the size of the harvest unit.

6.3.a.6. When post-harvest site preparation is required, managers select an effective method that minimizes ecological impact.

Note: Fire is considered to be more in keeping with ecosystem function and integrity and potentially less damaging to soil and water resources than either mechanical or chemical manipulation.

6.3.a.7. Methods of natural regeneration are used to achieve a desired level of stocking. Where necessary for natural regeneration, high quality seed trees are retained in number and distribution adequate to achieve the desired stocking levels. Where necessary to meet stocking, genetic restoration, and/or species diversity objectives, natural regeneration may be supplemented by planting locally adapted, source-identified, native species.

6.3.b Genetic, species, and ecosystem diversity

6.3.b.1. Highgrade logging (see Glossary) is not practiced. The forest owner or manager selects trees for harvest, retention, and planting in a manner that maintains or enhances the productive capacity, genetic diversity and quality, and species diversity of the residual stand.

6.3.b.2. A diversity of habitats for native species is protected, maintained, and/or enhanced.

For example:

- *Declining trees and snags (see Glossary)*
- *Vertical and horizontal structural complexity*
- *Understory species diversity*
- *Well-distributed large woody debris*
- *Habitats and refugia for sedentary species and those with special habitat requirements*

6.3.b.3. A diversity of ecosystems and landscape elements is protected, maintained and/or enhanced.

For example:

- *Springs, seeps, bogs, caves and rock outcrops*
- *Wildlife travel corridors and habitat connectivity*

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

6.3.c.1. Coarse woody debris, in the form of large fallen trees, large logs, and snags of various sizes, is maintained in accordance with the best available science.

6.3.c.2. Post-harvest management activities maintain soil fertility, structures, and functions.

For example:

- *Slash is randomly distributed across the harvest area.*
- *Burning is used where it is appropriate to the natural disturbance regime.*

6.3.c.3. Prescriptions for salvage harvest incorporate variable retention methods and balance ecological and economic considerations.

For example:

- *Coarse woody debris is maintained.*
- *Den trees, snags, healthy green trees and structural legacy are retained.*
- *Retained dead trees are clumped.*
- *Natural background levels of 'pest' populations are allowed before pest control actions are carried out.*

6.3.c.4. If soil quality degradation occurs, as indicated by declining fertility or forest health, forest owners or managers modify soil management techniques.

For example:

- *Primary management objectives shift from commercial production to restoration.*
- *Site preparation is minimized.*
- *Road system design and construction is upgraded.*
- *Equipment with low 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 or encouraged.*

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 Note: 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 plant 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 manipulated to maintain the desired conditions. Areas serving the purposes of (3) are fixed in location.

Forests of all sizes may be conducive to protection of fixed features, such as rock outcrops and bogs. 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. Where existing protected areas within the landscape are not of a size and configuration to serve the above purposes, forest owners or managers, whose properties are conducive to the establishment of such areas, designate ecologically viable areas that serve the three purposes noted above. The size and arrangement of on-site and off-site representative sample areas are designated, documented, and justified.

6.4.b. Forest owners or managers assess the adequacy of representation of their forest types in protected areas across the landscape. This assessment will entail collaboration with state natural heritage programs; public agencies; regional, landscape, and watershed planning efforts; universities; and/or local conservationists and may include gap analysis.

6.4.c. The size and extent of representative samples on public lands being considered for certification is determined through a transparent planning process that is accessible and responsive to the public.

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

6.4.e. Forest managers of large contiguous public forests (see glossary) being considered for certification establish and maintain representative protected areas sufficient in size to allow natural disturbances to occur at their natural state.

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.

Logging and Site Preparation

6.5.a. Logging operations and construction of roads and skid trails are conducted only during conditions when soil is least susceptible to compaction, surface erosion, or sediment transport into streams and other bodies of water.

> *For example, soils are either dry enough or frozen enough to minimize disturbance and compaction.*

6.5.b. Logging damage to regeneration and residual trees is minimized during harvest operations.

6.5.c. Silvicultural techniques and equipment types vary with slope, erosion hazard rating, and/or soil instability with the goal of minimizing soil disturbance. Areas that exhibit an extreme risk of landslide are excluded from logging.

> *For example, logging plans for areas having a high risk of landslide incorporate measures to protect soils, including such mitigations as retention of trees that are critical for slope stability and/or specified low-impact harvesting systems (such as skyline cable or helicopter).*

6.5.d. Plans for site preparation specify the following mitigations to minimize impacts to the forest resources:

1) Slash is concentrated only as much as necessary to achieve the goals of site preparation and the reduction of fuels to moderate or low fire hazard levels.
2) Scarification of soils is limited to the minimum necessary to achieve successful regeneration of desired species.
3) Topsoil is minimally disturbed.

6.5.e. Forestry operations minimize habitat fragmentation from timber harvesting by:

1) aligning the boundaries of harvest units with the boundaries of natural patches of habitat minimizing the creation of high-contrast edges.
2) maximizing the retention of interior forest habitat relative to forest edge.
3) maximizing the retention and/or restoring the natural linkages of habitat patches and habitat corridors that facilitate the movement of wildlife,
4) emulating natural disturbance patterns that are characteristic of the ecosystem when practicing forestry at the landscape scale.

6.5.f. Forestry operations minimize the area and adverse effects of log landings, and within-forest processing areas, such as areas used for chipping or debarking. Effective measures to control soil erosion and noxious weeds are applied to these areas.

Transportation System (including permanent and temporary haul roads and skid trails)

6.5.g. The transportation system is designed, constructed, maintained, and/or reconstructed to minimize the extent of the road network and its potential cumulative adverse effects on soils, water quality and wildlife habitat.

6.5.h. Forest operations with total road densities greater than 2.5 linear miles per square mile develop and implement a plan to reduce total road densities to less than 2.5 miles within 5 years.

6.5.i. Forest operations with open road densities greater than 1.5 linear miles per square mile develop and implement a plan to reduce open road densities to less than 1.5 miles within 5 years.

Note for 6.5.h. and 6.5.i: Limited variances from these road density standards may be justified by site-specific conditions, such as:

- *public roads across the ownership, e.g. county roads through the property not under the control of the forest owner*
- *controlled public access, e.g. landowner restricts public travel inside ownership boundaries*
- *steep terrain, e.g. steeper terrain may require higher densities for management purposes*
- *increasing total road density to improve overall ecological conditions, such as replacing a shorter creek-bottom road with a longer upslope road.*

(See "road density" in glossary.)

6.5.j. Plans for road management minimize habitat fragmentation.

For example

- *Minimize crossing natural linkages, such as connecting patches of habitat and routes and corridors for wildlife migration;*
- *avoid dissecting large, intact patches containing interior forest habitat;*
- *locate roads outside buffers surrounding valuable ecological elements, such as wetlands, habitat for sensitive species, and interior old-growth forest.*

6.5.k. Access to temporary and permanent roads is controlled to minimize impacts to soil and biota while allowing legitimate access as addressed by Principles 3 & 4 and identified in the management plan.

For example:

- *Roads without a weather resistant surface (e.g., soil, dirt, or native-surfaced roads) are used only during periods of weather when conditions are favorable to minimize road damage, surface erosion, and sediment transport.*
- *Access to roads not immediately necessary for management purposes is restricted.*

6.5.l. Failed drainage structures or other areas of active erosion caused by roads and skid trails are identified, and measures are taken to correct the drainage problems and decrease erosion.

<u>Stream and Water Quality Protection</u>

6.5.m. The forest owner or manager identifies and provides adequate protection for all streams, lakes, wetlands, and associated riparian areas. Streams, lakes, and wetlands are maintained in or restored to their properly functioning condition. Streamside management zones (SMZs) are established and maintained adjacent to all bodies of water and watercourses. The extent and protection of these buffer zones is adequate to serve all the functions and objectives of such zones in natural forests. These functions include, but are not limited to:

1) control of erosion of soil and organic debris,
2) control of stream sedimentation,
3) stabilization of surface and ground water flow fluctuations,
4) stabilization of water temperatures,
5) provision of organic debris (including large diameter wood) for the aquatic habitat,
6) provision of habitat (shelter, water, food, travel corridors, etc.) for many species of plants and animals.

6.5.n. SMZ width is at least 50 feet on either side of the ordinary high water mark, extending wider on steep or erosive slopes. Where slopes of SMZs exceed 35 percent, the SMZ boundary is at least 100 feet. If wetlands touch the SMZ, then the SMZ boundary is extended to include the wetland. SMZ width is extended wherever necessary to protect riparian functions listed in 6.5.m.

6.5.o. Management in the SMZs takes a conservative approach that puts aquatic and riparian concerns above timber consideration. Roads are prohibited in SMZs, except for permanent roads necessary to cross the stream at a perpendicular or other angle that causes the least ecological disturbance. Operation of wheeled or tracked equipment is prohibited in the SMZ, except on permanent roads. Temporary roads or designated skid trails across the SMZ may be permitted in rare instances after preparation of a pre-operation plan that protects riparian values. Logging operations retain at least half of the merchantable trees, representative of the pre-harvest stand, with heavier retention of bank-edge and leaning trees, shrubs, and submerchantable trees. Appropriate techniques are used to maintain existing roads and ditches to prevent adverse impacts to water quality. Storage, handling, or use of hazardous materials is prohibited in SMZs.

Applicability Note: Some discretion may be applied to stream segments that support no fish, and rarely contribute surface flow to other streams or other bodies of water, and normally have surface flow less than six months of the year. In such instances, standard width SMZs are designated, but management restrictions are more flexible, as long as riparian concerns continue to receive highest priority.

6.5.p. Stream crossings are located and constructed to minimize fragmentation of aquatic habitat (see Glossary) and maintain water quality.

For example:

- *Riparian management zone crossings are kept to a minimum.*
- *Stream crossings are installed at an angle that causes the least ecological disturbance.*
- *Culverts allow free passage of aquatic organisms.*

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 or managers employ silvicultural systems, integrated pest management, and vegetation control strategies that offer the greatest environmental protection. Techniques other than chemical applications are preferred in the implementation of these strategies.

Components of silvicultural systems, integrated pest management, and vegetation control strategies may include:

- *Creation and maintenance of habitat that discourages pests*
- *Creation and maintenance of habitat that encourages natural predators*
- *Evaluation of pest populations and establishment of action thresholds*
- *Diversification of species composition (see Glossary) and structure*
- *Use of mechanical methods*
- *Use of prescribed fire*

6.6.b. Forest owners or managers develop written pest control strategies as a component of the management plan (criterion 7.1), which will comply with the official FSC guidelines on the matter.

6.6.c. When chemicals are being used, a written prescription is prepared that fully describes the risks and benefits of their use and the precautions that workers employ. Records are kept of pest occurrences, control measures, and incidences of worker exposure to chemicals.

6.6.d. Synthetic fertilizers are used only to further overall goals of ecosystem restoration or environmental quality and only if such use maintains water quality.

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, the material is immediately contained and the spill is reported as required by applicable regulations. Qualified personnel are engaged to perform the appropriate removal and remediation.

6.7.b. Broken and 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 ground water supplies, where fluids may leak into them.

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

For example:

Management operations incorporate resource recycling and reuse programs when they are available."

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 guidelines on GMO's (http://www.fsc.org/en/whats_new/documents/Docs_cent/2FSC_POL_30_602_GMO_Policy_Paper_BM_19_22_2000_05.pdf).

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 (see Glossary) of plants, pathogens (see Glossary), insects, or other animals when other 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. The use of exotic plant species (see Glossary) is contingent on peer-reviewed scientific evidence that any species in question is non-invasive and does not diminish biodiversity. 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. Forest owners or managers develop and implement control measures for 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.

Note: Sales of forest land that result in the conversion of important habitat, valuable timberland, and/or high conservation forests may trigger the need for a re-assessment given possible negative impacts under criteria 4.4, 5.5, 6.3 and 9.3.

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.

7.1. The 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.

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

7.1.a. Management objectives

7.1.a.1. A written management plan is prepared that includes the landowner's short-term and long-term 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 ecologically appropriate structural and species diversity
  - Pest control (disease, insects, invasive species, and vegetation)
  - Soil and water conservation
  - Methods and annual rates of harvest, by species and products
  - Equipment and personnel needs
- Transportation system
- Fire management
  - Prescribed fires
  - Wildfires

Fish and wildlife and their habitats (including non-game species)
    Sensitive, rare, threatened and endangered species
Non-timber forest products
    Methods and annual rates of harvest, by species and products
    Regeneration strategies
Management of other commercial uses (hunting, fishing, grazing, and recreation, etc.)
Socioeconomic issues
    Public access and use
    Conservation of historical and cultural resources
    Protection of aesthetic values
    Employee and contractor policies and procedures
    Community relations
    Stakeholder notification
    Public comment process
American Indian issues
    Protection of legal and customary rights
    Procedures for integrating tribal concerns in forest management
    Management of sites of special significance
Special management areas
    Riparian management zone
    Set asides of samples of representative existing ecosystems
    Sensitive, rare, threatened, and endangered species protection
    Other protected areas
Landscape level analyses and strategies

7.1.b. Description of forest resources to be managed, environmental limitations, land use and ownership status, socioeconomic conditions, and profile of adjacent lands

7.1.b.1. Using data collected proportionally to the scale and intensity of management, the management plan describes the following resources:

1) Timber and forest types
2) Fish and wildlife
3) Harvested non-timber forest products (e.g., botanical and mycological)
4) Non-economic natural resources

7.1.b.2. The management plan includes descriptions of the following elements: special management areas; sensitive, rare, threatened, and endangered species and their habitats; and other ecologically sensitive features in the forest.

7.1.b.3. The management plan includes a description of past land uses and incorporates this information into goals and objectives.

7.1.b.4. 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).

7.1.b.5. The management plan identifies relevant cultural and socioeconomic issues (e.g., traditional and customary rights of use, access issues, recreational uses, and employment issues), 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).

7.1.b.6. The management plan incorporates landscape-level considerations within the ownership and among adjacent and nearby lands, including major water bodies, critical habitats, riparian areas, and wildlife travel corridors shared with adjacent ownerships.

7.1.c. Description of silvicultural and/or other management system

7.1.c.1. The silvicultural system(s) and prescriptions are based on the integration of ecological and economic characteristics (e.g., successional processes, soil characteristics, existing species composition and structures, desired future conditions, and market conditions). (See also 6.3.a)

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

7.1.d. Rationale for the rate of annual harvest and species selection

7.1.d.1. Periodic allowable cut (PAC) is an operational rate of harvest that may be achieved during a management period, the length of which shall be defined in the plan. The periodic allowable cut does not exceed LRSY (see criterion 5.6), except where justified in the plan on the basis of complying with one or more FSC principles, and where it does not violate any principles. Calculation of the periodic allowable cut is based on conservative and well-documented estimates of growth and yield, and the methodology is documented in the management plan.

7.1.d.2. The management plan considers the cyclical and potentially disruptive effects of future insect, disease, pest, windthrow, drought, and fire events in setting the periodic allowable cut.

7.1.d.3. Periodic allowable cut is calculated after removing areas that are excluded from harvest and considering areas that have reduced potential harvest because of other management goals. Calculation of the PAC and species selection considers management goals outlined in Principles 6, 9 and 10.

7.1.d.4. If non-timber forest products are harvested, the plan provides for sustainable yield of those products while meeting environmental and other management goals.

7.1.d.5. Species selection meets the economic goals and objectives of the forest owner or manager, while maintaining or improving the ecological composition, structures, and functions of the forest.

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

7.1.e.1. The management plan describes monitoring plans and procedures. Components include provisions for pre-harvest inventories and a post-harvest assessment of stocking. Inventories are kept up to date.

7.1.f. Environmental safeguards based on environmental assessments

7.1.f.1. The management plan describes measures for environmental protection and restoration based on information collected in accordance with Principle 6.

7.1.g. Plans for the identification and protection of rare, threatened, and endangered species.

7.1.g.1. The management plan describes measures for species protection and restoration based on information collected in accordance with Principle 6.

7.1.h. Maps describing the forest resource base including protected areas, planned management activities, and land ownership.

7.1.h.1. The management plan includes maps of the forest's characteristics, such as: relevant landscape-level factors; property boundaries; roads; timber production areas; forest types by age class; topography; soils; riparian zones; springs and wetlands; archaeological sites; cultural and customary use areas; locations of and habitats for sensitive, rare, threatened, and endangered species and ecosystems; and designated High Conservation Value Forest.

7.1.h.2. Maps are updated to reflect the effects of management operations, such as road construction or removal.

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

7.1.i.1. The management plan identifies information to be covered in site-specific logging plans, such as silvicultural prescriptions, timber marking, logging equipment, slash treatment, site preparation, and impact assessments.

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. The management plan describes the process for modifying or adapting the plan to incorporate the results of monitoring.

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

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., timber volumes by size and age class, marketing strategies, and other financial information). (see also Criterion 8.5)

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 could be appropriate. On large forests and intensively managed forests, 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. Implementation of the management plan is periodically monitored to assess:

1) The degree to which management vision, goals, and objectives have been achieved
2) Deviations from the management plan
3) Unexpected effects of management activities
4) Social and environmental effects of management activities

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) cost, productivity, and efficiency of forest management.

8.2.a. Yield of all forest products harvested

8.2.a.1. The forest owner or manager maintains records of standing timber and timber harvest volumes by species and volume.

8.2.a.2. The forest owner or manager maintains records of the yield of harvested non-timber forest products by species, volume, and grade.

8.2.a.3. Significant unanticipated removal (e.g., theft and poaching) of forest products and any adverse environmental impacts is monitored and recorded

8.2.b. Growth rates, regeneration, and condition of the forest

8.2.b.1. A technically sound inventory system is maintained to monitor:

a) Timber growth, mortality, stocking, and regeneration
b) Stand composition and structure
c) Effects of disturbances to the resources (e.g., disease, wind, fire, damage by insects and/or mammals)
d) Abundance, regeneration, and habitat conditions of non-timber forest products
e) Quality and quantity of water
f) Terrestrial and aquatic habitat
g) Ecosystem composition, structures, and functions
h) Soil characteristics
i) Vulnerability to fire and pests

8.2.b.2. . Inventory measurements are sufficiently detailed and timely to provide adequate monitoring of compliance with standards 5.6.a. through 5.6.d.

8.2.c. Composition and observed changes in the flora and fauna

8.2.c.1. Forest owners or managers periodically monitor the forest for changes in rare, sensitive, threatened, and endangered species and changes to key habitat elements, such as protected areas, wildlife movement corridors, interior forest, and other indicators of biological diversity.

8.2.d. Environmental and social impacts of harvesting and other operations

8.2.d.1. The environmental impacts of site-disturbing activities (e.g., road construction and repair, harvesting, site preparation) are assessed after their completion.

8.2.d.2. A monitoring program is in place to assess the condition and environmental impacts of the forest roads system.

8.2.d.3. Employment generation, creation or maintenance of local jobs, and public responses to management activities are monitored.

8.2.d.4. Management of sites of special significance (see indicators 3.2, 3.3 and 4.4) is jointly monitored with tribal representatives and/or other affected parties to determine adequacy of the management prescriptions.

8.2.e. Cost, productivity, and efficiency of forest management

8.2.e.1 Forest owners or managers monitor the cost and revenues of management in order to assess productivity and efficiency

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."

Note: For management requirements for chain-of-custody see Section 3.6 of Chain of Custody Standards, FSC Accreditation Manual.

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

8.4.a. Discrepancies between outcomes (i.e., yields, growth, ecological changes) and expectations (i.e., plans, projections, anticipated impacts) are appraised and taken into account in the subsequent management plan.

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 size and age class, marketing strategies, and other financial information).

8.5.a. A summary of monitoring information, trends, and changes is maintained up-to-date and is available upon request either at no cost or at a reasonable 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.

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).

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: Certain information may be withheld from public discussion to protect the attributes that may be of High Conservation Value. The level of delineation and consultations required is dependent on the scale and intensity of the operation.

9.1.a. Attributes and locations of High Conservation Value Forests are determined by:

(1) Globally rare, threatened, or endangered features, habitats, or ecosystems that may be present in the forest (suggested sources of information are: The Nature Conservancy, World Wildlife Fund, Conservation International, World Resources Institute);
(2) Regionally and locally rare, threatened, or endangered features, habitats, or ecosystems that may be present in the forest; culturally and tribally significant areas; or municipal watersheds that may

be present in the landscape and/or certified forest (suggested sources of information include natural and cultural heritage agencies);
(3) Appropriate consultations with local and regional scientists and other stakeholders;
(4) Public review of proposed HCVF attributes and areas on large-scale and public ownerships (see also 7.4, 4.4.e., 4.4.f.);
(5) Integration of information from consultations and public review into proposed HCVF delineation;
(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.

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 approach 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 unentered old-growth stands (see Glossary), 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, including old-growth attributes. 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….*

* American Indian tribes may be granted an exception to the general prohibition of programmatic commercial timber harvest in old-growth High Conservation Value Forests (HCVF, see 9.3.a). Tribes in the conterminous 48 states are the only class of private landowners whose properties are likely to contain a high proportion of intact old-growth HCVF. In many cases, these reservation lands have no second-growth stands that are developed to commercial potential. Nevertheless, timber revenues are a critical element in the economic health and cultural survival of these timber-dependent sovereign nations. Asking tribal governments to forego timber harvest in old-growth stands would devalue tribally designed forest management that otherwise meets or exceeds FSC Standards. In order to be certified, however, tribes are expected to set aside a representative portion of such forests as reserves.

Scientifically-based regional exception to national indicator 9.3.a: Because the portion of Rocky Mountain forests in old-growth condition shifts across the landscape over time, and because old-growth forests don't live forever, existing old-growth forests may be logged only if and when replacement old-growth has been recruited so that there is no net loss of old growth. Owners or managers who own, manage and harvest old growth recruit equivalent old growth within the ownership.

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. When natural disturbance regimes, such as fire, have been altered in a HCVF in a way that significantly modifies the naturally occurring stand structures and composition, forest management restores stand structure and composition to conditions within the historical range of variability. Where such natural processes have been interrupted, forest management restores or mimics them to the extent possible.

9.3.d. 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.

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.

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.

10.1.a. The management plan identifies existing plantations that are to be maintained (commercial plantations) and those that are to be restored to more natural forest conditions (restoration plantations [see applicability note under 10.9]). The objectives of plantations are clearly justified in the management plan**.**

10.1.b. Commercial plantations are maintained within a broader landscape matrix such that they complement, or do not compromise, the high conservation values of the forest landscape.

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**:** Tree planting is encouraged as a means to reestablish forest on deforested or degraded lands (e.g. abandoned pastures, where forests would naturally occur), but not on lands supporting native, non-forest ecosystems.*

10.2.a. On areas already converted to plantations, even-aged harvests lacking within-stand retention are limited to forty acres or less in size unless a larger opening can be justified by scientifically credible analyses.

Applicability note: Credible scientific analyses is defined as scientific opinions supported by data and explanations in articles published in peer-reviewed natural or social science professional journals, and which has been discussed by the U.S. Standards Committee (USSC) and judged to be relevant to the matter in question. When necessary to gain clarity and perspective, the USSC will consult with scientists, forestry specialists, FSC members, and other stakeholders. Scientific credibility, as it applies to this criterion, is thus based on a body of scientific work and on the judgment of experienced professionals

10.2.b. Regeneration in previously harvested areas reaches a mean height of at least ten feet or achieves canopy closure (see Glossary) before adjacent areas are harvested. Buffers between harvest units are arranged to allow contiguous populations of native species.

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.

10.3.a. Forests containing plantations are managed to create and maintain structural and species diversity that results in viable wildlife habitat and long-term soil maintenance and replenishment.

For example:

- *Plantings using natural, non-uniform spacing are preferred to planting in uniform patterns and rows.*
- *Thinnings provide light to the forest floor, which enhances understory species diversity.*
- *Plantings of mixed species is preferred to planting of single species plantations.*
- *Less frequent burning cycles allow establishment of a well-developed herbaceous layer, shrub layer, and mid-story.*

10.3.b. Plantation management activities are planned so as to generate and maintain long-term employment.

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 use 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.

10.4.a. The use of exotic plant species (see Glossary) is contingent on peer-reviewed scientific evidence that any species in question is non-invasive and does not diminish biodiversity. 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.

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.

10.5.a. The ratio of plantations to natural and semi-natural forests (see Glossary), as well as the plantation's spatial distribution, maintain and/or restore the landscape to a condition that includes a diversity of community types, wildlife habitats, and ecological functions similar to a mosaic of native forests.

10.5.b. Areas of forest and/or plantation to be restored to natural conditions are chosen through a landscape analysis that focuses on enhancing ecological integrity and habitat connectivity.

For example, areas that are best suited for such restoration include riparian areas, migration corridors between areas of existing natural forest, and unstable slopes.

10.5.c. Where forestlands were previously converted to plantations, a percentage of the total plantation management area will be restored to natural and semi-natural forest cover. The minimum required percentage is:

- for 100 acres or less, at least 10 percent
- for 101 – 1,000 acres, at least 15 percent
- for 1,001 – 10,000 acres, at least 20 percent
- for >10,000 acres, at least 25 percent

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. *(See Criterion 6.5. and its indicators.)*

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.

10.8. Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessments 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.

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.

GLOSSARY

Includes definitions adopted by FSC, the FSC-U.S. Standards Committee, and the Rocky Mountain Working Group

Allottee(s): Person(s) holding an Indian allotment on a property. 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).

Biological diversity: The variability among living organisms from all sources including, i*nter 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.

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

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.

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

Chemicals: The range of artificial fertilizers, pesticides, and hormones that are used in forest management.

Clearcut: A stand in which essentially all trees have been removed in one logging operation.

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.

Conservation zone: Areas of the FMU where ecological values are the highest priority. Various forest uses, including extractive activities, are allowed in conservation zones if they don't degrade the habitat or may enhance it.

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

Critical areas: Areas on the FMU that are especially important for maintaining and restoring high conservation values, such as wildlife corridors, high concentrations of biological diversity, certain old growth forests, refugia, unique or unusual ecosystem types, municipal watersheds or archeological sites.

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.

Disturbance: An event that changes the local environment, opening up an area, facilitating regeneration of existing species and colonization by new, often different, organisms (e.g., wind, storms, insects, fire, and human activities such as logging.)

Disturbance regime: The type, frequency and distribution of natural disturbances in a given area that influence forest structure, composition and succession.

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

Endangered species: Any species which is in danger of extinction throughout all or a significant portion of its range, and listed by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service under the Endangered Species Act of 1973.

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

Forest: (A) The property or portions of a property that is under certificate or being assessed for certification; the corresponding FSC nomenclature is "Forest Management Unit." (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.

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

Forest management/manager: 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 that have had their genetic material altered in a way that does not occur naturally by mating or natural recombination or both. Examples of techniques covered by this definition include the following:
- Recombinant DNA techniques using viral or bacterial vectors.
- The direct introduction of DNA into an organism, e.g. by microinjection.
- Cell fusion or hybridization.

Clones, hybrids formed by natural pollination processes, or the products of tree selection, grafting, vegetative propagation or tissue culture are not GMOs, unless produced by GMO techniques.

High Conservation Value Forests: Forests that possess one or more of the following attributes:

1) 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

2) forest areas that are in or contain rare, threatened or endangered ecosystems.

3) forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control)

4) 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).

Highgrade logging: The removal of the most commercially valuable trees, leaving a residual stand composed of trees of poor condition or species composition. High grading may have both genetic implications (i.e. dysgenic effects) and long-term economic or stand health implications.

Historical range of variability: A term used by ecologists to describe the natural fluctuation of ecosystems over time. HRV refers to the range of conditions and processes likely to have occurred prior to settlement of the region by Euro-Americans (about the mid-1800s). HRV serves as a reference point from which change can be measured, rather than a condition that ecosystem management necessarily tries to attain.

Indicator: A variable that specifically tells whether a criterion is met in a regional context, and which specifically states desired management outcomes and processes.

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.

Indigenous peoples: Native American or Indian tribes, nations, communities or bands, and their members. This definition may include groups that are not recognized by the federal government.

Intellectual property: Legal rights of ownership that individuals and corporations have over products of their creativity and inventiveness. In the context of Principle 3, intellectual property includes rights claimed by indigenous peoples over their traditional cultural knowledge about the use of forest species or management systems in forest operations, particularly in instances where that knowledge is commercialized.

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.

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 techniques of silviculture and management.

Interior forest: An area within a forest that is characterized by a microclimate distinct from that outside the forest, and/or characterized by the relative absence of biophysical phenomena and biotic communities associated with forest edges and exteriors.

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.

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

Long-run sustained yield: The cutting rate that the forest would be able to sustain indefinitely given compliance with all FSC principles, the goals and objectives stated in the plan, and clearly documented data on inventory, growth, regeneration and expected yields. LRSY is calculated after removing areas that are excluded from harvest and considering areas that have reduced potential harvest because of other management goals. LRSY is measured in units pertinent to the marketing of forest products (i.e. board feet per acre per year for sawtimber-sized logs or cubic volume for fiber production.)

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.

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, animals and disturbance processes 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.

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 domestic animal products.

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.

Old-growth forests: Old-growth forests are defined by structural characteristics quantified by forest type, including numbers of large, live trees, canopy conditions, levels of decadence, minimum number and size of snags, and minimum quantities of large down logs and coarse woody debris. Stand age, although a useful indicator of old growth in unlogged forests, is less important than structure because the rate of stand development depends more on environment and stand history than age alone, and dominants are often multi-aged. The minimum area needed for an old-growth forest to be a functional ecological unit depends on the nature and management of surrounding areas; small areas often do not contain all old-growth elements. Regionally developed and widely accepted descriptions of old growth have been developed for three sub-regions of the Rocky Mountain region. They include Green et al, 1992, for northern Idaho and Montana; Hamilton, 1993, for southern Idaho, western Wyoming, Utah and Nevada; and Mehl, 1992, for northern Colorado, eastern Wyoming and South Dakota.

Green, P., John Joy, Dean Sirucek, Wendel Hann, Art Zack and Bob Naumann. 1992. Old-growth forest types of the Northern Region. Unpubl. Report, USDA Forest Service, Northern Region. Missoula, MT. 60 pp.

Hamilton, R.C. 1993. Characteristics of old-growth forests in the Intermountain region. USDA Forest Service, Intermountain Region, Ogden, Utah. 86 pp.

Mehl, M.S. 1992. Old-growth descriptions for the major forest cover types in the Rocky Mountain region. p. 106-120 In: Kaufmann, M.R., W.H. Moir, and R.L. Bassett (editors) Old-growth forests in the Southwest and Rocky Mountain regions: Proceedings of a workshop. USDA Forest Service General Technical Report RM-213, Rocky Mt. Forest and Range Experiment Station, Fort Collins, Colorado.

Partial certification: When only a portion of a forest owners land within the region is certified.

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

Periodic allowable cut: An operational rate of harvest that may be achieved during a specified management period defined in the plan and amenable to periodic revisions to the forest plan.

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.

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. A planted forest is not necessarily a "plantation," since it may possess natural forest attributes. In the Rocky Mountain region, any of the following characteristics may indicate that a forest is a plantation (though not necessarily one that is certifiable):

* Cultivation of exotic species.
* Single-species cultivation on sites normally occupied by multiple-species forests.
* Regular, periodic stand treatments intended to eliminate natural in growth of native trees and associated ground vegetation.
* Plantings in uniform patterns and rows.
* Systematic (i.e. regular, recurring and intensive use over the length of the rotation) use of and reliance on chemical herbicides, pesticides, and fertilizers.

Precautionary approach: An operational principle in which managers err on the side of caution when making choices that could have adverse environmental consequences. This approach requires managers to take precautionary measures even if some cause and effect relationships are not fully established scientifically.

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

Protection areas: Areas of the FMU where ecological values are the highest priority and where extractive and incompatible activities are excluded.

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

Refugia: Locations and habitats that support populations of native organisms that are limited to small fragments of their previous geographic range.

Restoration: The process of modifying a habitat or ecosystem to introduce or reintroduce composition, structure and function 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.

Road Density: Total road density is the extent of the road network including open and closed roads averaged across the entire forested ownership. It does not include decommissioned or obliterated roads, which cannot be traversed by motorized vehicles. Open road density includes roads open to use by motorized vehicles.

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

Semi-natural forest: Forest areas where some of the principal characteristics and key elements of native ecosystems such as complexity, structure and diversity are present. Semi-natural forests are distinguishable from natural forests where most of the principle characteristics and elements of native ecosystems are present, and plantations where few of those characteristics and elements are present. For example, a forest whose species composition and structural integrity has been diminished by past management activities, such as highgrade logging, may be considered a semi-natural forest.

Sensitive species: Any species for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population number or density, or (b) habitat capability that would reduce a species' existing distribution, as identified by state and federal agencies and state natural heritage programs.

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.

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; often also characterized by aspect, which is 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/Family_Forests_Program_Procedures.pdf) 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.

Standards: The set of principles, criteria and regional indicators used by FSC-accredited certifiers.

Stream: A stream can be identified in one of two ways. A stream must have a sandy or gravel bottom. Or a stream must have definite banks that restrict water.

Streamside management zone: A strip of variable width on each side of a water body or watercourse measured from the ordinary (yearly average) high water mark or definable bank.

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).

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, and listed by the U.S. Fish and Wildlife Service or National Marine Fisheries Service under the Endangered Species Act of 1973.

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 areas 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.

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.

Verifier: A forest condition or state that can be easily assessed to determine whether an indicator has been met.

Water bodies: Lakes, reservoirs or ponds greater than 1/10 of an acre.

Watercourses: Streams, creeks or rivers that have a generally sandy or rocky bottom or definite banks and that confines and conducts continuously or intermittently flowing water. Watercourses also include irrigation and drainage systems that discharge directly into a stream, lake or other surface water.

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

Wetlands: Areas that remain wet long enough to support a prevalence of plants that need saturated soil conditions. Wetlands include marshes, swamps, bogs and similar areas.

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

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Appendix 1
Description of the FSC-US Rocky Mountain Region

Prepared by Greg Blomstrom, Forest Analyst
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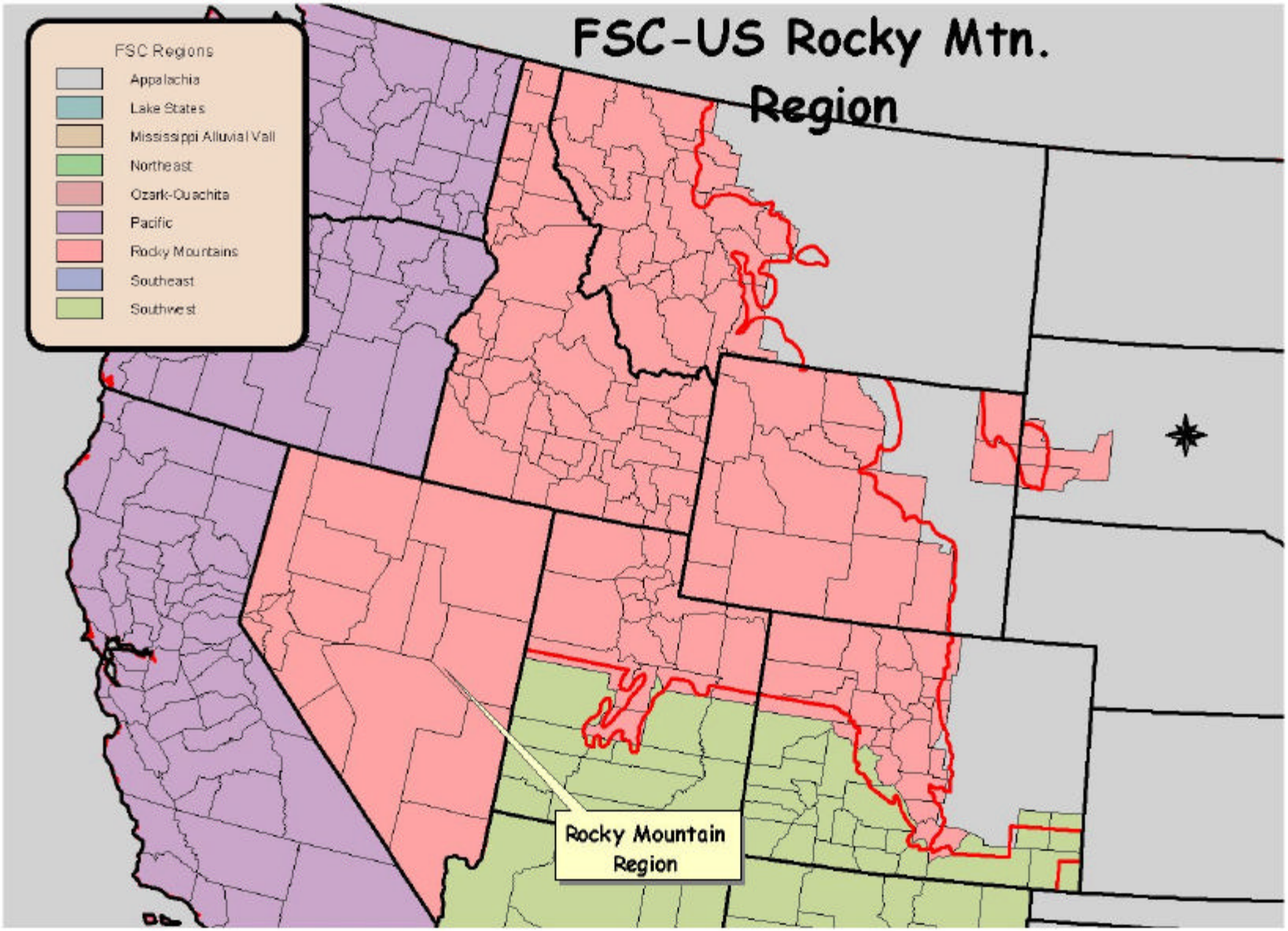
The FSC-US Rocky Mountain region is composed of all or portions of the States of Nevada, Colorado, Montana, Idaho, Wyoming, Utah and South Dakota, within the United States of America. Within these states, all of the following counties are within the region. The map on the last page shows the general location of the states and counties within the region.

The region was defined using a combination of earlier work previously describing the region and posted on the FSC-US website, ecosystem boundaries from Ricketts and then intersecting the former regional boundaries, ecosystem boundaries and US counties in ArcView. A county was included in the region if more than ½ of the county was within the regional boundary.

Rocky Mountains	Colorado	Boulder	Rocky Mountains	Idaho	Jerome
Rocky Mountains	Colorado	Chaffee	Rocky Mountains	Idaho	Kootenai
Rocky Mountains	Colorado	Clear Creek	Rocky Mountains	Idaho	Latah
Rocky Mountains	Colorado	Custer	Rocky Mountains	Idaho	Lemhi
Rocky Mountains	Colorado	Eagle	Rocky Mountains	Idaho	Lewis
Rocky Mountains	Colorado	Fremont	Rocky Mountains	Idaho	Lincoln
Rocky Mountains	Colorado	Garfield	Rocky Mountains	Idaho	Madison
Rocky Mountains	Colorado	Grand	Rocky Mountains	Idaho	Minidoka
Rocky Mountains	Colorado	Huerfano	Rocky Mountains	Idaho	Nez Perce
Rocky Mountains	Colorado	Jackson	Rocky Mountains	Idaho	Oneida
Rocky Mountains	Colorado	Jefferson	Rocky Mountains	Idaho	Owyhee
Rocky Mountains	Colorado	Larimer	Rocky Mountains	Idaho	Payette
Rocky Mountains	Colorado	Moffat	Rocky Mountains	Idaho	Power
Rocky Mountains	Colorado	Park	Rocky Mountains	Idaho	Shoshone
Rocky Mountains	Colorado	Pitkin	Rocky Mountains	Idaho	Teton
Rocky Mountains	Colorado	Rio Blanco	Rocky Mountains	Idaho	Twin Falls
Rocky Mountains	Colorado	Routt	Rocky Mountains	Idaho	Valley
Rocky Mountains	Colorado	Summit	Rocky Mountains	Idaho	Washington
Rocky Mountains	Colorado	Teller	Rocky Mountains	Montana	Beaverhead
Rocky Mountains	Idaho	Ada	Rocky Mountains	Montana	Broadwater
Rocky Mountains	Idaho	Adams	Rocky Mountains	Montana	Cascade
Rocky Mountains	Idaho	Bear Lake	Rocky Mountains	Montana	Deer Lodge
Rocky Mountains	Idaho	Benewah	Rocky Mountains	Montana	Flathead
Rocky Mountains	Idaho	Bingham	Rocky Mountains	Montana	Gallatin
Rocky Mountains	Idaho	Blaine	Rocky Mountains	Montana	Glacier
Rocky Mountains	Idaho	Boise	Rocky Mountains	Montana	Granite
Rocky Mountains	Idaho	Bonner	Rocky Mountains	Montana	Jefferson
Rocky Mountains	Idaho	Bonneville	Rocky Mountains	Montana	Judith
Rocky Mountains	Idaho	Boundary	Basin		
Rocky Mountains	Idaho	Butte	Rocky Mountains	Montana	Lake
Rocky Mountains	Idaho	Camas	Rocky Mountains	Montana	Lewis and
Rocky Mountains	Idaho	Canyon	Clark		
Rocky Mountains	Idaho	Caribou	Rocky Mountains	Montana	Lincoln
Rocky Mountains	Idaho	Cassia	Rocky Mountains	Montana	Madison
Rocky Mountains	Idaho	Clark	Rocky Mountains	Montana	Meagher
Rocky Mountains	Idaho	Clearwater	Rocky Mountains	Montana	Mineral
Rocky Mountains	Idaho	Custer	Rocky Mountains	Montana	Missoula
Rocky Mountains	Idaho	Elmore	Rocky Mountains	Montana	Park
Rocky Mountains	Idaho	Franklin	Rocky Mountains	Montana	Pondera
Rocky Mountains	Idaho	Fremont	Rocky Mountains	Montana	Powell
Rocky Mountains	Idaho	Gem	Rocky Mountains	Montana	Ravalli
Rocky Mountains	Idaho	Gooding	Rocky Mountains	Montana	Sanders
Rocky Mountains	Idaho	Idaho	Rocky Mountains	Montana	Silver Bow
Rocky Mountains	Idaho	Jefferson	Rocky Mountains	Montana	Teton

Rocky Mountains	Montana	Yellowstone National Park (Part)
Rocky Mountains	Nevada	Carson City
Rocky Mountains	Nevada	Churchill
Rocky Mountains	Nevada	Clark
Rocky Mountains	Nevada	Douglas
Rocky Mountains	Nevada	Elko
Rocky Mountains	Nevada	Esmeralda
Rocky Mountains	Nevada	Eureka
Rocky Mountains	Nevada	Humboldt
Rocky Mountains	Nevada	Lander
Rocky Mountains	Nevada	Lincoln
Rocky Mountains	Nevada	Lyon
Rocky Mountains	Nevada	Mineral
Rocky Mountains	Nevada	Nye
Rocky Mountains	Nevada	Pershing
Rocky Mountains	Nevada	Storey
Rocky Mountains	Nevada	Washoe
Rocky Mountains	Nevada	White Pine
Rocky Mountains	Colorado	Gilpin
Rocky Mountains	Colorado	Lake
Rocky Mountains	Idaho	Bannock
Rocky Mountains	Wyoming	Fremont
Rocky Mountains	Wyoming	Lincoln
Rocky Mountains	South Dakota	Custer
Rocky Mountains	South Dakota	Lawrence
Rocky Mountains	South Dakota	Pennington
Rocky Mountains	Utah	Box Elder
Rocky Mountains	Utah	Cache
Rocky Mountains	Utah	Carbon
Rocky Mountains	Utah	Daggett
Rocky Mountains	Utah	Davis
Rocky Mountains	Utah	Duchesne
Rocky Mountains	Utah	Juab
Rocky Mountains	Utah	Morgan
Rocky Mountains	Utah	Rich
Rocky Mountains	Utah	Salt Lake
Rocky Mountains	Utah	Sanpete
Rocky Mountains	Utah	Sevier
Rocky Mountains	Utah	Summit
Rocky Mountains	Utah	Tooele
Rocky Mountains	Utah	Uintah
Rocky Mountains	Utah	Utah
Rocky Mountains	Utah	Wasatch
Rocky Mountains	Utah	Weber
Rocky Mountains	Wyoming	Albany
Rocky Mountains	Wyoming	Big Horn
Rocky Mountains	Wyoming	Carbon
Rocky Mountains	Wyoming	Crook
Rocky Mountains	Wyoming	Hot Springs
Rocky Mountains	Wyoming	Natrona
Rocky Mountains	Wyoming	Park
Rocky Mountains	Wyoming	Sublette
Rocky Mountains	Wyoming	Sweetwater
Rocky Mountains	Wyoming	Teton
Rocky Mountains	Wyoming	Uinta
Rocky Mountains	Wyoming	Washakie
Rocky Mountains	Wyoming	Weston


FSC-US Rocky Mtn. Region
FSC Regions
Appalachia
Lake States
Mississippi Alluvial Vall
Northeast
Ozark-Ouachita
Pacific
Rocky Mountains
Southeast
Southwest
Rocky Mountain Region