Final
Appalachia (USA) Regional Forest Stewardship Standard
Version 4.2

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Introduction

The forest stewardship standard of the Appalachia region was drafted through a series of meetings of the Appalachia Regional Working Group of FSC-US. The indicators and examples in this standard were developed to provide regional context to the FSC Principles and Criteria. This standard has been harmonized with and meets all requirements of the FSC-US National Indicators.

World Wildlife Fund (Ricketts et al. 1999) has delineated ecoregions for the U.S., based on work by Omernik (1986). The Appalachia region is comprised of three ecoregions: the Allegheny Highlands Forests, the Appalachia Blue Ridge Forests, and the Appalachia Mixed Mesophytic Forests. Forest owners and managers who are uncertain if their forest falls within one of these ecoregions, and thereby whether this standard applies to their management, should consult Ricketts et al. (1999), representatives of FSC-US, and/or FSC-accredited certifiers.

The Appalachia region extends over one thousand miles in length from north to south, which makes generalizations about climate, geology, and biological conditions irrelevant to management requirements. The region is widest across northern Pennsylvania and southern New York, where it extends almost all of the way across those states. It is narrowest at the southern end, where it dissects Alabama and Georgia by less than 200 miles from east to west. Hardwood forests dominate in all three ecoregions.

The Allegheny Plateau was dominated by stands of hemlock and beech that were sustained by periodic fire and windthrow prior to European settlement. Between 1890 and 1920, loggers cleared most of the Plateau, except for a few pockets of old growth. The considerable slash that remained after widespread cutting allowed catastrophic fires, which reduced the proportion of hemlock, white pine, sugar maple, and beech, and increased the proportion of aspen and pin cherry. Populations of deer prevent robust regeneration of many tree species in this subregion; beech is a notable exception. The Allegheny Highlands are moderately fragmented, and secondary forests now grow where agriculture failed in previous decades.

The Appalachian Blue Ridge Forests and the Appalachian Mixed Mesophytic Forests represent some of the world's most species-rich forests. A large variety of landforms, climate, soils, and geology has led to a highly diverse assemblage of species. During Pleistocene glaciations, these ecoregions acted as a mesic and thermal refuge for a number of species and communities, and the legacy of that enrichment persists in today's flora and fauna. The forests are dominated by broad-leafed, deciduous plants; non-woody plants with underground, energy-storage structures; and an abundance of spring-flowering plants. For example, the Great Smoky Mountains, a subregion of the Blue Ridge Mountains, hosts over 1400 spring-flowering plants. The southern Appalachian region is the world's center of diversity for plethodontid salamanders (lungless salamanders). Small-scale diversity (alpha and beta) is high for amphibians, snails and spiders because of a high number of ancient, relict species and the isolation that results from peak and valley topography. With 158 species of trees, the Blue Ridge Mountains

are the most tree-diverse ecoregion in the United States. Together, these two ecoregions contain the highest number of endemic floral and faunal species of any region in North America.

The region is subject to economic pressures to produce large quantities of saw timber and pulp. In some areas, the rate of timber harvest and changes in landuse exceed the growth rates of timber. Non-renewal resource extraction, including coal, gas, and oil, also threaten the quality and quality of forest habitats, as well as the region's water resources. Almost all forest types in the region are under-represented in a system of protected areas.

Working Group History

From 1996 until 1999, the Mountain Area Community and Economic Development (MACED) agency in Berea, Kentucky, coordinated the activities of the Appalachia Working Group. Stakeholders from economic, environmental, and social chambers participated in the working group, but few social-chamber members were actively engaged in the development of the standard. The coordinator, Michael Jenkins, Director for Sustainable Forestry at MACED, made numerous efforts to recruit participants from the social chamber. Loggers, moderate environmental interests, processors of forest products, and forest managers participated in the working group. Campaigning ENGOs (e.g., Dogwood Alliance and Heartwood) participated in the early phases of standard development, but discontinued participation in the working group early in the process. However, Dogwood Alliance has continued to provide written input during public review periods. Exhaustive efforts were made to gain participation from all relevant stakeholder groups. Certified forest managers, including representatives from the State of Pennsylvania, Kane Hardwood, and Freeman Forest Products, participated actively in the development of this standard.

In the fall of 2001, Jeff Stringer, professor in the Department of Forestry, University of Kentucky, and FSC-US Standards Committee member, began coordinating the Working Group. From the fall of 2001 through June 2002, Dr. Stringer processed the input from stakeholders through meetings, phone conferences, and written comments. From July until October 2002, Dr. Stringer worked with stakeholders and the FSC-US Standards Committee to refine the draft standard. Also during this time, FSC-US placed the proposed standard on its web site for a 60-day period of public review (between July 23 and September 23, 2002). A total of 19 commenters comprised of individuals, companies, and environmental organizations submitted over 140 specific comments on the indicators, as well as 14 general comments. On October 8, 2002, the FSC-US Standards Committee reviewed the draft and FSC-US staff and Standards-Committee members further refined the draft throughout October 2002. A second, revised draft of the standards was then put out for an additional 30-day public review via the web site, as well as being mailed to stakeholders that provided written input during the first public review period. The last round of comments (114 specific comments from 9 individuals and/or companies) were reviewed and addressed by the FSC-US Standards Committee at it's December 11, 2002 meeting, which culminated in the final draft of the standards for

submission to FSC-US.

FSC US Federal Lands Policy

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 FSCUS.ORG. and the applicability note at the beginning of the standard.

Principle level failure

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

1. has continued for one year or longer,
2. is systematic throughout the management organization,
3. has created adverse effects over a wide area, which is defined as either the entire set of lands controlled by the forest owner or manager or a subwatershed, which ever is smaller (for definition of subwatershed see: http://watershed.org/news/fall_94/terminology.html.)

In addition failure to meet any of the following indicators is considered as a principle level failure:

*4.2.b. Forest owners or managers require contractors to meet or exceed federal and state standards for health and safety.

*4.4.e. Significant archaeological sites and sites of cultural, historical, or community significance, as identified through consultation with state archaeological offices, tribes, universities, and local experts, are designated as special management zones or otherwise protected.

*6.5.i. Measures to protect streams (including perennial, intermittent, and ephemeral streams and other waters) from degradation of water quality and/or their associated aquatic habitat are used in all operations.

*6.6.e. Employees are trained in proper the handling, storage, and disposal of chemicals. Employees who apply pesticides either meet or exceed local and state certification for applicators. Chemicals are applied according to label directions, and protective equipment is both available and used.

*7.1.g.1. State heritage programs are contacted regarding the occurrence of species referred to in Criterion 6.2, and any report received is attached to the plan.

Periodic Review Process

The FSC-US Board will periodically review this standard during the accreditation period. At a minimum a comprehensive review will be conducted no later than 6 months prior to the expiration of the endorsement period (e.g. no later than January 7, 2009). During the review period the FSC-US Board will solicit feedback from Working Group members, certificate holders, certifying bodies, FSC members, interested individuals and the general public. Information from scoping will be reviewed by the FSC-US Board and incorporated into the standard as needed.

Literature cited

Omernik, J.M. 1986. *Ecoregions of the U.S.* Map at a scale of 1:7,500,000. United States Environmental Protection Agency.

Ricketts, T.H., E. Dinerstein, D.M. Olson, C.J. Loucks, W. Eichbaum, D. DellaSala, K. Kavanaugh, P. Hedao, P.T. Hurley, K.M. Carney, R. Abell, and S. Walters. 1999. *Terrestrial ecoregions of North America: a conservation assessment*. Island Press: Washington.

Martin, William H. 1992. *Characteristics of old-growth mixed mesophytic forests*. Natural Areas Journal 12(3):127-135.

Final
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Forest Stewardship Standard
Version 4.1

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 both state forest practice regulations and Best Management Practices for forestry, whether voluntary or regulatory, 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 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, 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.

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

1.3.b Forest owners or managers comply with ILO Labor Conventions impacting forest operations and practices and the ILO Code of Practice on Safety and Health in Forestry Work.

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

Applicability note to Criterion 1.4: When the certifier (i.e., the FSC-accredited certification body) and the forest owner or manager determine that compliance with laws and the FSC Principles cannot be simultaneously achieved, the matter is referred to FSC.

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 marking boundaries and posting notices, using gates, blocking skid trails and roads during the harvest, 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.

Applicability note to Criterion 1.6: This criterion is guided by FSC Policy and Guidelines: Partial Certification for Large Ownerships (BM19.24), May 2000.

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

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 or managers make available information on legal and customary rights of use associated with the forest. These rights include both those held by the party seeking certification and those held by other parties.

For example other parties may have long term leases, timber rights, rights-of - way, or other assured rights of ownership, management or use.

2.1.b. Land boundaries are clearly identified on the ground by forest owners or managers prior to commencement of site-disturbing activities (e.g., burning, harvesting, regeneration and intermediate treatments, chemical applications, road building).

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

2.2.a. Forest owners or managers allow well-established customary and lawful uses of the forest to the extent that they are consistent with the conservation of forest resources and the objectives stated in the management plan.

2.2.b. On ownerships where customary rights of use and traditional and cultural areas/sites exist, forest owners or managers consult (with a view to obtaining free and informed consent) 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. Forest owners or managers maintain relations with community stakeholders to identify disputes in their early stages. If disputes arise, a forest owner or manager initially attempts to resolve them through direct discussions, negotiations, and/or mediation. If these good-faith efforts fail, federal, state, local, and/or tribal laws are employed to resolve disputes over tenure and use rights.

2.3.b. Forest owners or managers provide information regarding unresolved and ongoing disputes over tenure and the rights of use to the certifying body.

2.3.c. The forest owner or manager is not involved in outstanding disputes of substantial magnitude involving a significant number of interests in relation to tenure claims and use rights.

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 to Principle 3: 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.

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.

3.2. 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 who have current legal or customary rights to use 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 invite tribal representatives to identify sites of current or traditional significance within the property proposed for certification.

Areas of special significance may include:
- *ceremonial, burial, or village sites*
- *areas used for hunting, fishing, or trapping*
- *areas currently used for gathering culturally important or ceremonial materials, such as basket materials, medicinal plants, or plant materials used in dances*

- *areas currently used for purposes of subsistence, such as gathering mushrooms, berries, acorns, etc.*

3.3.b. Forest owners or managers develop measures to protect or enhance areas of special significance. Forest owners or managers invite tribal representatives to help develop these measures.

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. Individuals and/or tribes are fairly compensated when commercialization of intellectual property or forest products takes place.

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

Examples of quality work include the following attributes:

- *Employee and contractor relationships that are long term and stable*
- *A mixture of diverse tasks that requires varying levels of skill*
- *Opportunities for advancement*
- *A comprehensive package of benefits*

- *Opportunities for employee and contractor participation in decision-making*

4.1.b. Conditions of employment (e.g., remuneration, benefits, safety equipment, training, and workman's compensation) are as good for non-local workers as they are for local workers doing the same job.

4.1.c. Forest owners or managers utilize qualified local foresters, loggers, and contractors.

4.1.d. Forest managers and their contractors give preference to qualified local workers.

4.1.e. Forest owners or managers procure goods and services locally.

4.1.f. Forest owners or managers participate in local economic development and civic activities.

4.1.g. 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.h. Employee compensation and hiring practices meet or exceed the prevailing local norms for work that requires an equivalent education, skills, and experience.

4.1.i. 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 respect to hiring, dismissal, remuneration, and other conditions of employment.*
- *People who work as employees are classified as employees, and not as contractors.*

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

4.2. Forest management meets or exceeds all applicable laws and/or regulations covering health and safety of employees, and their families.

4.2.a. Forest owners or managers and their contractors develop and implement safety programs and procedures that include:
(1) well-maintained and safe machinery and equipment
(2) use of safety equipment appropriate to each task
(3) documentation and posting of safety procedures in the workplace
(4) educational efforts (such as logger training and education programs)
(5) contracts with safety requirements
(6) safety records, training reports, and certificates

*4.2.b. Forest owners or managers require contractors to meet or exceed federal and state standards for health and safety.

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).

Applicability Note to Criterion 4.3: Compliance with this criterion can be accomplished with guidance from FSC Certification and ILO Conventions: FSC Policy Paper and Guidelines. May 20, 2002.

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 include:
- *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.

4.4. 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 to Criterion 4.4: People and groups directly affected by management operations may include: employees and contractors of the landowner, neighbors, fishers and hunters, recreationalists, users of local water, and processors of forest products.

4.4.a. Forest owners or managers contribute to designing and achieving goals for the use and protection of forest resources, as articulated in local and regional plans.

4.4.b. Forest owners or managers of large forests (see glossary) 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, such as logging adjacent to property boundaries 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.

For example:

- *Notification of management activities is posted to a website.*
- *There are periodic mailings.*
- *Signs are posted either permanently or on a project basis.*
- *News announcements are made.*
- *Community and general public announcements are made.*

4.4.d. Significant concerns identified in 4.4.c. are addressed in management policies and plans.

For example:

- *Management activities are modified in response to concerns.*
- *A rationale is provided for not responding to a concern.*

*4.4.e. 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.

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.

4.5.a. Before forest owners or managers initiate legal action, they utilize open communication and negotiation to address grievances and mitigate damage resulting from forest management activities.

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

4.5.c. Forest owners or managers institute measures to avoid loss or damage to the legal or customary rights, property, resources, or livelihood of local people

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.

Applicability Note to Principle 5: Non-timber forest products are managed and produced according to Guidelines for Non-timber Forest Product Management in Appalachia (see Appendix A).

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

5.1.a. Forest owners or managers have the resources to support long-term (e.g., decades rather than quarter-years or years) forest management, e.g., planning, inventory, resource protection, post-harvest management activities, etc.

> *For example, sufficient capital from forest management activities, operations, or other sources is maintained to cover future expenses of forest management.*

5.1.b. Responses (e.g., increases in harvests or debt load) to short-term financial factors-(e.g., 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. Conditions for each timber sale are clearly established. Forest owners or managers use a legal timber sale contract and a map of the timber sale area.

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 facilities for value-added processing and manufacturing.

5.2.b. Markets are explored and used when available for common but less-used species (e.g., hemlock, mountain laurel, sourwood, rhododendron, black gum, dogwood), grades of lumber (e.g., pulp), or an expanded diversity of forest products.

5.2.c. Technical and financial specifications are developed for the sale of forest products to local processors when it is consistent with the objectives of the management plan and federal and state laws.

5.2.d. When non-timber products are harvested, the management and use of those products are incorporated into the management strategy (See Appendix A).

For example, non-timber forest products that are harvested include, but are not limited to; ginseng and other root crops, maple syrup, mushrooms (morel, shiitake, etc.), grapevines, sassafras, branches of mountain laurel, firewood

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

5.3.a. Felling, skidding/yarding, bucking, sorting, and handling are carried out in a way that maximizes log scale and grade.

5.3.b. Harvest is implemented in a way that protects the integrity of the residual stand. Provisions ensuring that residual damage does not exceed regional averages based on slope percent, size and pre-existing conditions of timber, species and time of year are included in operational contracts.

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

5.3.c. Woody debris is retained on site to provide biological capital for the cycling of nutrients and the maintenance of habitat (see indicator 6.3.c.). Woody debris in excess of this amount is sold when markets exist, and is distributed throughout the forest when they do not.

For example:

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

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.

5.4.b. Forest owners or managers reinvest in the local economy and the community through 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 the development of local business by working with organizations, such as chambers of commerce.*

5.5. Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries. (see also indicator 6.5.j)

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

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

5.6.a. The sustainability of harvest levels is based on documented data on growth and regeneration, site index models, and classification of soils, appropriate to the scale and intensity of the operation. .

For example:

- *The rates and volumes of stocking conform to projections of the management plan.*
- *The age-class distribution required for sustainability and predicted yields in volume are justified by empirical data.*

5.6.b. After an age-class distribution (see Glossary) commensurate with long-term sustainability is achieved (See Appendix D), records of growth and harvest show that growth rates meet or exceed harvest rates over a period of no more than 10 years. Forest owners or managers ensure that, after harvest the size-class distribution is maintained.

5.6.c. Exceptions to the constraint that growth rates meet or exceed harvest rates within a 10-year period may be granted to forest owners or managers whose periodic re-entry cycle is longer than 10 years. In such cases, allowable harvest is determined by examining the volume of re-growth and harvest since the previous harvest and the owner or manager's commitment to allow an equivalent amount of re-growth before additional harvests.

5.6.d. 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.

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 to Principle 6: Owners or managers of small forests that practice low-intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments (e.g., professionally prepared assessments) are expected by owners and managers of large forests 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 scientific information and local expertise, an assessment of current conditions is completed that includes: (1) ecological processes, such as disturbance regimes; (2) vulnerable, imperiled, and critically imperiled plant community types (G1-G3, N1-N3, and S1-S3, according to NatureServe and natural heritage databases); (3) common plants, animals, and their habitats; (4) imperiled (e.g., butternut), threatened, and endangered species and their habitats (according to state and federal statutory listings); as well as G1-G3, N1-N3, and S1-S3 species and their habitats (according to NatureServe and natural heritage databases); (5) water resources; and (6) soil resources. (see also subcriteria 7.1.a. and 7.1.b.)

6.1.b. Using available scientific information and local expertise, the current ecological conditions are compared to the historical conditions within a landscape context by 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 (see Glossary) 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).

6.1.e. Monitoring the establishment of invasive species is conducted throughout the forest with special emphasis on disturbed areas and areas where exotic species are known to exist.

For example, scouting is carried out where disturbances occur.

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 species databases indicate the likely presence of a rare, threatened and endangered species or plant community type, 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 were present. If an applicable species and plant community type is determined to be present, its location is reported to the manager of the applicable database.

6.2.b. When a rare, threatened or endangered species or plant community type is present or assumed to be present, the necessary modifications are made in both the management plan and its implementation. Management activities are compatible with the maintenance, improvement, or restoration (see Glossary) of the species and its habitat.

6.2.c. Conservation zones are created and/or maintained for existing rare, threatened or endangered species and plant community types to enhance the viability of populations and their habitats, including their connectivity within the landscape.

6.2.d. When rare, threatened or endangered species or plant community types are present or assumed to be present, control of hunting, fishing, trapping and collecting is adequate to protect species and/or plant communities.

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

APPLICABILITY TO OLD GROWTH:

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

*Certified old-growth forests **not** designated as High Conservation Value Forest are managed to maintain or 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.*

*Applicability Note to Criterion 6.3: Old-growth forests or stands (see glossary) do **not** include areas that have developed the following characteristics through management for the production of timber products: a complex canopy structure, large amounts of coarse*

woody debris, and an open understory with late seral plant species present. While a few old-growth forests are present in the region, the majority of old-growth areas are stands less than 500 acres. Due to the size and the divergence of forest characteristics within the Appalachia Region, it is not possible to provide a singular definition of old-growth stands or forests.

Characteristics of old-growth forests and stands typically include a complex canopy structure, large amounts of coarse woody debris, and an open understory with late seral plant species present. Additional characteristics have been identified by Martin (1992).

6.3.a. Forest regeneration and succession

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

Applicability Note to Indicator 6.3.a.1: This indicator may have limited applicability for managers of small and mid-sized forest properties because of their limited ability to coordinate their activities with other owners within the landscape, or to significantly maintain and/or improve landscape-scale vegetative patterns.

6.3.a.2. Forest owners or managers maintain or restore portions of the forest to the range and distribution of age classes of trees that would result from processes that occurred naturally on the site.

6.3.a.3. Silvicultural practices provide disturbances and generate stand conditions that result in a successional phase that would occur naturally on the site.

6.3.a.4. Natural regeneration is used unless artificial regeneration is required for establishing extirpated species or enhancing naturally occurring species.

6.3.a.5. The techniques used for regeneration are justified for each harvest unit and/or stand.

6.3.a.6. When uneven age silvicultural techniques are used (e.g., individual tree selection or group selection), canopy openings are less than 2.5 acres.

Applicability Note to Indicator 6.3.a.6: Uneven age silvicultural techniques are used when they maintain or enhance the overall species richness and biologic diversity, regenerate shade-tolerant or intermediate-tolerant species, and/or provide small canopy openings to regenerate shade-intolerant and intermediate species. Uneven-age techniques are generally used to develop forests with at least three age classes.

6.3.a.7. Uneven age silviculture is employed to prevent high-grading and/or diameter limit cutting.

6.3.a.8. When even-aged or two-aged management (e.g., seed tree, regular or irregular shelterwood), or deferment cutting (see Glossary) is employed, live trees and native vegetation are retained and opening sizes are created within the harvest unit in a proportion and configuration that is consistent with the characteristic natural disturbance regime in each community type (see Glossary), unless retention at a lower level is necessary for restoration or rehabilitation purposes. Harvest openings with no retention are limited to 10 acres.

Applicability Note to Indicator 6.3.a.8: Even-age silviculture is used only where naturally occurring species are maintained or enhanced. Retention within harvest units can include riparian and streamside buffers and other special zones. In addition, desirable overstory and understory species may be retained outside of buffers or special zones while allowing for regeneration of shade-intolerant and intermediate species consistent with overall management principals. Where stands have been degraded, less retention can be used to improve both merchantable and non-merchantable attributes.

6.3.b. Genetic, species, and ecosystem diversity

6.3.b.1. Forest owners or managers select trees for harvest, retention, and planting in a manner that maintains or enhances the productive capacity, genetic diversity, land 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*
- *Diversity of understory species*
- *well-distributed, large woody debris*
- *habitats and refugia for sedentary species and those with special habitat requirements*

6.3.b.3. Locally adapted seed (e.g., seedlings available from the state Department of Natural Resources) of known provenance is used for artificial regeneration.

6.3.b.4. Silvicultural systems and techniques are used that lower the natural vulnerability of stands to existing and potentially threatening perturbations, such as pest outbreaks and windthrow.

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

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

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 harvests balance ecological and economic considerations.

For example:
- *Coarse woody debris is maintained.*
- *Den trees and snags are maintained.*

6.3.c.4. Forest owners or managers modify soil management techniques that are designed to ensure degradation of soil quality does not occur.

For example:
- *Primary management objectives shift from commercial production to restoration.*
- *Site preparation is minimized.*
- *The design and construction of the road system is upgraded.*
- *The most environmentally sensitive equipment is used.*
- *Longer rotations and a diversity of species are used in lieu of artificial fertilization.*
- *Natural early successional processes are allowed and/or encouraged.*

6.3.c.5. Whole-tree harvesting and the burning of slash and stumps are used only where it is ecologically justified, e.g., for pest control.

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

Applicability Notes:

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

Ecologically viable representative samples are designated to serve one or more of three purposes: (1) to establish and/or maintain an ecological reference condition; (2) to create or maintain an under-represented ecological condition (e.g., successional phases of a forest type or natural community (see Glossary); and (3) to protect a feature that is sensitive, rare, or unique in

the landscape. Areas serving the purposes of (1) and (2) may move across the landscape as under-represented conditions change, or may be fixed in area and managed to maintain the desired conditions. Areas serving the purposes of (3) are fixed in location.

For managed forest communities in the Northeast Appalachia region, ecologically mature or late-successional phases (not including old growth) are generally under-represented and would qualify as representative sample areas under purposes 1 and 2. Tolerant or long-lived mid-tolerant species (e.g., white pine.) typically dominate such stands. Depending on the site and forest community, characteristics may include a well-developed understory flora, relative stability of species composition, multi-layered canopies, stable or declining live timber volume, live trees in upper quartile of expected diameter growth for the site, presence of recognized late-successional indicator species (such as certain mosses, lichens or other epiphytes), and accumulation of large snags and large downed woody material. Examples of classification systems that include some of these concepts are: "Types of Old Growth Forests" as defined by Minnesota Department of Natural Resources (http://www.dnr.state.mn.us/forests/oldgrowth/types.html), and, Minnesota DNR Old-Growth Forest Policy - Goals and Results, at http://www.dnr.state.mn.us/forests/oldgrowth/policy.html.

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

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

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

Forests of all sizes may be conducive to protection of fixed features, such as rock outcrops and 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. Forest owners and managers protect and reserve ecologically viable representative areas that are appropriate to the scale and intensity of the operation.

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

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

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

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

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

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

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

6.4.e. Forest owners and managers of public land determine the size and extent of representative sample areas through a transparent planning process that is accessible and responsive to the public.

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

6.4.g. Forest owners and managers of large, contiguous public forests (see glossary) create and maintain representative protected areas sufficient in size to allow natural disturbances to occur in 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.

6.5.a. Harvesting, road construction, and other mechanical operations meet or exceed state Best Management Practices (BMPs), whether voluntary or mandatory, and other applicable water quality regulations.

6.5.b. Written harvest plans, specifying how soil, tree, and water resources will be protected, are incorporated into the management plan or harvesting contract, as appropriate.

Logging and Site Preparation

6.5.c. The harvest of timber is scheduled and equipment is used in a way that minimizes damage to the soil, e.g., compaction, erosion, sediment transport into streams and other bodies of water, and landslides.

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

6.5.d. Damage to regeneration and residual trees is limited to levels that are at or below levels documented in regionally credible scientific evidence.

6.5.e. Silvicultural techniques and logging equipment vary with slope, erosion hazard rating, and/or soil instability with the goal of reducing soil disturbance to a level that is equal to or less than average soil disturbance documented in regionally credible scientific evidence. Areas that exhibit an extreme risk of landslide are excluded from logging.

6.5.f. Plans for site preparation specify the following mitigations:

> (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 levels of hazard from fire.

(2) Scarification of soils is limited to the minimum necessary to achieve successful regeneration of desired species.

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

6.5.g. The transportation system is designed, constructed, maintained, and/or reconstructed to regional standards that reduce the extent of the road network to the lowest level possible consistent with terrain, equipment and markets.

For example:

- *Road density is as low as possible given terrain, equipment and markets.*
- *Patches of habitat and migration corridors are present.*
- *The integrity of riparian zones (see Glossary) and buffers (see Glossary) surrounding other valuable ecological elements (e.g., wetlands, habitat for sensitive species, and interior old-growth forest) are conserved.*

6.5.h. Access to temporary and permanent roads is controlled to allow legitimate access as addressed by Principles 3 & 4 and identified in the management plan.

Stream and Water Quality Protection

*6.5.i. Measures to protect streams (including perennial, intermittent, and ephemeral streams and other waters) from degradation of water quality and/or their associated aquatic habitat are used in all operations.

For example:

- *Where state BMP guidelines, recommendations, and regulations provide several options, the most protective measure is applied.*
- *Streams are crossed with improved structures.*
- *Channels, including those of ephemeral streams, are crossed with improved structures, where it is topographically and economically feasible.*
- *Logging debris and disturbed soil are not left in, or cause blockage to, ephemeral channels/streams.*

6.5.j. New roads, trails, and crossings are located, constructed, and maintained in accord with 6.5.e – 6.5.l.

6.5.k. Where roads cross perennial or intermittent streams, temporary or permanent bridges, culverts, fords (see Glossary), or other improved crossings are used. *Note: Perennial streams are defined as solid blue line streams on 7.5-minute quad maps or those that contain water year-around.*

6.5.l. Temporary and permanent roads are located to limit the number of crossings to that required for access and ensure that crossings are perpendicular to the waterway. In selecting the location of crossings, the impact of the road is minimized by placing a

crossing at a natural constriction of a stream's flood plain.

6.5.m. Areas of human-caused erosion (e.g., failed drainage structures) are identified as part of the planning process. Measures are taken to stabilize the erosion, correct existing drainage problems, and prevent new problems.

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

For example:
- *Riffles are crossed at the bottom.*
- *Structures are selected and constructed that minimize the modification of the movement of water.*

Streamside management zones (SMZs)

6.5.o. The activities of forest management do not result in observable siltation of intermittent streams.

6.5.p. All perennial streams have buffers (streamside management zones, SMZs) that, by using the criteria described in 6.5.q through 6.5.s, include an inner SMZ and an outer SMZ.

6.5.q. The entire SMZ of intermittent streams is managed as an outer buffer zone as described in Table 6.5.

Inner SMZs for non-high-quality waters

6.5.r. The inner SMZ extends 25 feet from the high water mark (see Glossary). Single-tree selection or small group selection (2-5 trees) is allowed in the inner SMZ, provided that the integrity of the stream bank is maintained and canopy reduction does not exceed 10 percent (90 percent canopy maintenance). Trees are directionally felled away from streams.

Note: The inner SMZ is designed as a virtual no-harvest zone, while allowing the removal of selected high-value trees.

Inner SMZs for high quality waters

6.5.s. Along perennial streams that are designated as high-quality waters (see state or local listings describing the highest quality waters in the state or region), no harvesting is allowed in the inner SMZ (25 feet from the high water mark), except for the removal of wind-thrown trees. Stream restoration is allowed if a written restoration plan provides a rational justification and if the plan follows local and regional restoration plans.

Outer SMZs for all streams

6.5.t. Outer SMZs, outside and in addition to inner SMZs, are established for all intermittent, and perennial streams, as well as other waters. When the necessary information is available, the width of a stream management zone is based on the landform, erodibility of the soil, stability of the slope, and stability of the stream channel as necessary to protect water quality and repair habitat. When such specific information is not available, the width of streamside management zone is calculated according to Table 6.5.

Table 6.5.t
Widths Of Inner And Outer Streamside Management Zones
Where Data Do Not Prescribe Narrower Widths*

STREAM ZONE TYPE	SLOPE CATEGORY				
	1-10%	11-20%	21-30%	31-40%	41 % +
Inner Zone (perennial)	25’	25’	25’	25’	25’
Outer Zone (perennial)	55’	75’	105’	110’	140’
Total for perennial	80’	100’	130’	135’	165’
Zone for Intermittent	40	50’	60’	70’	80’

*All distances are in feet -slope distance and are measured from the high water mark (see Glossary).

SMZ sizes are minimum widths that are likely to provide adequate riparian habitat and prevent siltation. If functional riparian habitat and minimal siltation are not achieved by SMZs of these dimensions, wider SMZs are needed.

6.5.u. Harvesting in outer SMZs is limited to single-tree and group selection (see Glossary), while maintaining at least 50 percent of the overstory. Roads, skid trails, landings, and other similar silviculturally disturbed areas are constructed outside of the outer SMZ, except for designated stream crossings or when placement of disturbance-prone activities outside of the SMZ would result in more environmental disturbance than placing such activities within the SMZ. Exceptions may be made for stream restoration.

Note: The SMZ is designed to allow harvesting and provide flexibility for silvicultural management.

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.

Applicability Note to Criterion 6.6: This Criterion is guided by FSC Policy Paper and Guidelines: Chemical Pesticides in Certified Forests: Interpretation of the FSC Principles and Criteria. Revised July 2002. In addition, 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.

6.6.a. Forest owners or managers employ silvicultural systems, integrated pest management, and strategies to control vegetation thathave been scientifically proven to have the lowest number of non-target effects. Chemical pesticides are used only when non-chemical management practices have been proven ineffective or require expenditures exceeding economic gains.

For example, 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 low-impact mechanical methods*
- *use of prescribed fire*

6.6.b. Forest owners or managers develop written strategies to control pests as a component of the management plan (see Criterion 7.1).

6.6.c. When chemicals are used, a written prescription is prepared that fully describes the risks and benefits of their use and the precautions that workers must employ.

6.6.d. Records are kept to document the occurrences of pests, measures to control them, and incidences of worker exposure to chemicals.

*6.6.e. Employees are trained in proper the handling, storage, and disposal of chemicals. Employees who apply pesticides either meet or exceed local and state certification for applicators.

6.6.f. Chemicals are applied according to label directions, and protective equipment is both available and used.

6.6.g. When chemicals are used, they are narrowly targeted to the species being controlled.

6.6.h. Chemicals are used only when they pose no threat to supplies of domestic water, aquatic habitats, or sensitive species or plant community types.

6.6.i. Aerial spraying of pesticides is used only for the control of exotic species.

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

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

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 that disposes materials in a manner that avoids contamination.

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

6.7.d. Forest owners or managers and their contractors participate actively in local recycling and reuse programs that dispose materials in a manner that avoids contamination.

6.7.e. Procedures are established for the proper management of all waste oil, filters, containers, litter, and other forms of waste created during the harvest operation in a manner that avoids contamination.

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 to Criterion 6.8: Genetically improved organisms (e.g., Mendelian crossed) are not considered to be genetically modified organisms (i.e., results of genetic engineering), and may be used. The prohibition of genetically modified organisms applies to all organisms including trees. This Criterion is guided by the FSC policy paper: GMOs: Genetically Modified Organisms: Interpretation for FSC. Revised October 1999.

6.8.a. Exotic (i.e., non-indigenous), non-invasive predators or biological control agents are used only as part of a pest management strategy for the control of exotic species of plants, pathogens (see Glossary), insects, or other animals when alternative pest-control methods are ineffective or can be expected to prove 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.) Exceptions are allowed for restoration of extirpated species.

6.8.b. Forest owners and managers document the use of exotic non-invasive predators and biological control agents and strictly follow all applicable laws, regulations and scientific protocols.

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

PRINCIPLE #7: MANAGEMENT PLAN
A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

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 to Criterion 7.1: 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.

Appropriate to scale, intensity and context of management, owners or managers of small forests that practice low-intensity forestry may meet this requirement with less extensive and detailed planning documents. Large landowners and/or those who practice more intensive forest management (see Glossary) are expected to meet the full breadth and scope of this Principle.

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.

7.1.a.2. A strategy is described for monitoring the effectiveness of management and the overall condition of the forest- *(see Principle 8).*

7.1.a.3. Employee and contract policies are described.

7.1.a.4. Goals, objectives, and methods are described for: (1) harvest and regeneration, (2) pest management, (3) fire management, and (4) conservation of applicable species

and plant community types (i.e., those that are covered by Criterion 6.2), protection of riparian management zones (see Criterion 6.5), establishment and protection of representative samples of existing ecosystems (see Criterion 6.4), and management of High Conservation Value Forests (see Principle 9).

7.1.a.5. *Appropriate to the scale, intensity, and context of management*, the plan *may* include the additional elements described in Appendix C.

7.1.a.6. Mechanisms for resolving grievances and providing fair compensation for loss or damage to local people are described.

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 by methods appropriate to the scale and intensity of management, as well as the information collected by the landowner/manager as per indicators 6.1.a and 6.1.b forest owners or managers describe the following resources:

- timber
- fish and wildlife
- harvested non-timber forest products (e.g., botanical and mycological)
- non-economic natural resources

7.1.b.2. The management plan includes a description of past land uses and incorporates this information into goals and objectives.

7.1.b.3. 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.4. The management plan identifies relevant cultural and socioeconomic issues (e.g., traditional and customary rights of use, issues of access, recreational uses, and issue surrounding employment), current 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.5. The management plan incorporates landscape-level considerations within the ownership and among adjacent and nearby lands, to include but not be limited to major water bodies, critical habitats, and riparian corridors shared with adjacent ownerships.

7.1.b.6. The management plan identifies opportunities to coordinate management goals and activities with other owners and managers within the landscape.

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

7.1.c.1. 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., forest regeneration and succession)

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

7.1.c.3. Areas that are no longer in use are closed after harvests. The impact of harvesting on future crop trees and the forest as a whole is assessed.

7.1.d. Rationale for the rate of annual harvest and species selection (see criterion 5.6)

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

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

7.1.e.1. Monitoring goals and objectives are stated in the management plan.

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

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

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

*7.1.g.1. State heritage programs are contacted regarding the occurrence of species referred to in Criterion 6.2, and any report received is attached to the plan.

7.1.g.2. Strategies for protecting rare, threatened and endangered species or plant community types are described in the management plan.

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 forest-level maps of relevant landscape-level factors, including property boundaries, roads, areas of timber production, forest types by age class, topography, soils, areas of cultural and customary use; locations of and habitats of species referred to in Criterion 6.2; and designated High Conservation Value Forest, and riparian zones. Stand-level maps include springs, wetlands, and archaeological sites.

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

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

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. Relevant provisions of the management plan are modified: (1) every 10 years or in accordance with the frequency of harvest for the stand or forest, whichever is longer; (2) in response to effects from illegal and/or unauthorized activities (e.g., damage to roads, depletion of timber and non-timber resources), (3) in response to changes caused by natural disturbances, and/or (4) inresponse to the results of monitoring.

7.2.b. A summary of forest management activities is provided annually, and the management plan is revised at least every ten years.

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

7.3.a. Forest owners and managers use logging and silvicultural contractors who are certified or trained by certified local, state, or national programs.

For example, logger training and certified operator programs are used.

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 to Criterion 7.4: Forest owners or managers of private forests may withhold proprietary information (e.g., the nature and extent of their forest resource base, marketing strategies, and other financial information). (see also Criterion 8.5)

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

PRINCIPLE #8: MONITORING AND ASSESSMENT
Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

Applicability Note to Principle 8: On small and medium-sized forests, an informal, qualitative assessment might be appropriate. On large forests and intensively managed forests, formal, quantitative monitoring is 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:

- the degree to which the management vision, goals, and objectives have been achieved
- deviations from the management plan
- unexpected effects of management activities or other disturbances
- social and environmental effects of management activities

8.1.b. Consistent with the scale and intensity of management, forest owners or managers develop and consistently implement a comprehensive and replicable monitoring plan that includes the rationale for and intensity of monitoring.

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. Forest owners or managers maintain records of standing timber and timber-harvest volumes by species and grade.

8.2.a.2. Forest owners or managers maintain records of the yield of harvested non-timber forest products by species, volume, and grade.

8.2.a.3. Unanticipated removal (e.g., theft and poaching) of forest products is monitored and recorded.

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

8.2.b.1. Growth rates, regeneration, and condition of the forest are monitored at least every 10 years.

8.2.b.2. A monitoring system suitable to the scale and intensity of the operation is in place to assess:

- timber growth, mortality, stocking, and regeneration
- stand composition and structure
- effects of disturbances to the resources (e.g., management activities, disease, wind, flood, fire, and damage by insects and/or mammals).
- abundance, regeneration, and habitat conditions of non-timber forest products
- quality and quantity of water
- terrestrial and aquatic habitat
- ecosystem composition, structures, and functions
- soil characteristics
- vulnerability to fire and pests

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

8.2.c.1. Forest owners or managers periodically monitor the forest (at least every five years) for changes in major habitat elements and major fauna and for changes in the occurrence of species covered by criterion 6.2.

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

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

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

8.2.d.3. The creation and/or maintenance of local jobs is monitored. .

8.2.d.4. Public responses to management activities are monitored.

8.2.d.5. Forest owners or managers invite tribal representatives and other affected parties to monitor the management of sites of special significance to determine the adequacy of existing management prescriptions.

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

8.2.e.1. Forest owners or managers monitor the costs and revenues of management.

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

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

8.4.a. Findings from monitoring of discrepancies between outcomes (i.e., yields, growth, ecological changes) and expectations (i.e., plans, projections, anticipated impacts) are documented. Monitoring results are implemented in periodic revisions of the management plan, policy and procedures.

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

8.5.a. An up-to-date monitoring summary is maintained and is made available on request, either at no cost or at a nominal price.

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

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 to Criterion 9.1: Forest and community types in the Appalachia region that have HCVF attributes include, but are not limited to:

- *Old-growth oak-hickory (Quercus spp.-Carya spp.) forests on the Cumberland Plateau and on the Highland Rim of Tennessee*
- *Mixed mesophytic cove sites on the Cumberland Plateau*
- *Limestone glades in Tennessee and Kentucky*
- *Pocosins (evergreen shrub bogs) and other mountain bogs in Virginia, Tennessee, and North Carolina*
- *other forest and woodland plant community types listed by NatureServe as critically endangered, endangered, or vulnerable (G1-G3, N1-N3, and S1-S3) in*

the region, unless further refined by consultations with heritage programs, local native plant societies, local experts, and ENGOs;

- *un-entered old-growth stands and intact old-growth forests;*
- *roadless areas (areas without roads, logging roads, or skid trails), larger than 500 acres;*
- *habitats for threatened or endangered species;*
- *unique and sensitive geophysical features, such as caves and rock outcrops; and*
- *forested wetlands or glades, such as springs, fens, and seeps.*
- *Spruce-fir (Picea rubens-Abies fraseri) forests in southern Appalachia*
- *Atlantic white-cedar (Chamaecyparis thyoides) stands Red spruce (Picea rubens) forests in central Appalachia*

Owners and managers of small forests that practice low-intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments (e.g., formal assessments by scientists) are expected by owners and managers of large forests and/or those who practice more intensive forestry (see Glossary) management.

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

- identification of globally scaled HCVF attributes that may be present in the forest
- identification and description of regionally and locally scaled HCVF attributes and areas that may be present in the landscape and/or certified forest
- broadly based consultations with stakeholders and scientists
- public review of proposed HCVF attributes and areas
- integration of information from consultations and public review into proposed HCVF delineations
- delineation by maps and habitat descriptions

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

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

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

Applicability Note to Criterion 9.3: The applicability of the precautionary principle and the consequent flexibility of forest management vary with the size, configuration, and tenure of the HCVF:

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

9.3.a. The precautionary principle requires that no active management be conducted in un-entered and/or intact old-growth forests (see Glossary), unless it is necessary to maintain or enhance the HCVF values, which includes old-growth attributes. Tribal lands are excepted from this provision

For example, maintenance of old-growth and HCVF attributes may be carried out by removal of exotic species, and by use of controlled burning.

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

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

9.3.d. The public summary of the management plan contains management and protection policies for the HCV areas that are precautionary, readily assuring that the defining conservation values will be maintained or enhanced.

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

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

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

Applicability Note to Principle 10: Plantations are not prevalent in the Appalachian Region and do not represent the preferred method of managing a typical Appalachian forest. While adjoining regions may contain ecosystems that have been historically managed with plantations and landowners may have land in more than one region, plantation management in the Appalachian region is only appropriate where they already exist, and for restoration purposes.

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 objectives and management of each plantation are described in the forest management plan.

10.1.b. Environmental safeguards for the plantation's management are clearly stated in the management plan (e.g., monitoring and control plans for invasive species).

10.1.c. The forest owner or manager demonstrates a systematic pattern of implementing the plantation management objectives in the management plan.

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.

10.2.a. Plantations do not replace, endanger, or otherwise diminish the ecological integrity of existing forests.

10.2.b. Plantation layout is sensitive to slope, aspect, and the potential for soil erosion.. The degradation and erosion of soil are minimized.

10.2.c. The design and layout of plantations to be moved toward more natural conditions are adequate to achieve that objective.

10.2.d. Where plantations exist, they are managed to improve natural habitats and to integrate the plantation area within the surrounding natural landscape. The plans and

methods to restore habitats are determined by the scale and intensity of the operation, spatial patterns (e.g., the contiguity of the forest), and other relevant landscape factors.

10.2.e. 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 (see Glossary).

10.2.f. 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:

- *Thinning provide light to the forest floor, which enhances understory species diversity.*
- *Less frequent burning cycles allow establishment of a well-developed herbaceous layer, shrub layer, and mid-story.*
- *A mixture of species is planted.*

10.3.b. Management of plantations is planned in a way that generates and maintains 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 used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.

10.4.a. Tree species are well suited for the site's elevation, aspect, slope, hydric conditions, and soil conditions.

10.4.b. The rationale for the selection of species is documented in the forest management plan. Also documented in the plan is the fact that any introduced species are non-invasive, do not diminish biodiversity, and are not hosts for exotic pathogens.

10.4.c. Planting of non-invasive, exotic and/or non-native species is allowed for purposes of site remediation and experimental purposes, and based on credible scientific analysis. Justification for such plantings is provided (see Criterion 9.4.). If non-invasive exotic plant species are used, their provenance and the location of their use are documented, and their ecological effects are monitored.

10.4.d. Potentially invasive plant or animal species are not introduced.

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. Plantations are integrated over a wide spatial scale with surrounding landscapes to maintain an ecological balance between plantations and natural forests, as well as between even-aged and uneven-aged stands.

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

10.5.c. A percentage of the total forest management area is maintained as and/or 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 to 10,000 acres, at least 20 percent.
- for > 10,000 acres, at least 25 percent

10.5.d. 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.

10.6 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).

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

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 makes 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.

10.7.a. The management plan includes strategies to control pests, wild fires, and invasions of plants.

10.7.b. Pests (e.g., weeds, insects, and disease) are managed by the principles of integrated pest management. Management activities are implemented by qualified personnel and documented.

10.7.c. Forest managers, through their policies and actions and consistent with criterion 6.6, demonstrate a commitment to minimize the use of chemical pesticides and fertilizers.

10.8. Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species is 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.

10.8.a. The provisions of monitoring required in Principle 8 (including an assessment of local welfare and social well-being) apply to plantations as well as to natural forests.

10.8.b. Consistent with Criteria 6.9 and 10.4, forest owners and managers select species for planting only after local trials and credible scientific evidence demonstrate their suitability to the site.

10.8.c. Consistent with P2 and P3 customary use rights, forest owners and managers establish plantations on lands only where ownership and use rights have been settled.

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.

10.9.a Plantation stands established through conversion after 1994 may be considered for certification if a plan to restore these stands to natural forest conditions is being implemented.

Appendix A. Guidelines for Non-timber Forest Product Management in Appalachia

Non-timber forest products (NTFPs) are managed in accordance with Principles and Criteria 1-10, and criteria and indicators in this Guide. Harvest of NTFPs usually have lower impacts on the forest ecosystem than timber harvesting; can provide an array of social and economic benefits, particularly to community operations; and is an important component of managing the forest ecosystem. NTFPs require special considerations with respect to management and monitoring in order to ensure the long-term viability of species and to minimize adverse social and ecological impacts.

Note: This Guide only applies to those landowners that receive social or financial benefits from NTFP management.

1. The management plan identifies and provides specific guidelines for each NTFP species or species group that is considered for commercial harvest, and identifies the most important NTFPs for subsistence uses.

   a. Provisions of CITES and other relevant treaties and agreements are adhered to.

2. Management plans, operational activities, and monitoring address the ecological impacts to NTFP production and ensure the long-term viability of NTFP populations. Plans, operations, and monitoring activities are developed when NTFP production: (1) requires the removal of individuals, (2) affects the growth of other species, (3) potentially reduces forest stand productivity, (4) causes damage to trees or other forest products, (5) critically impacts nutrient cycling, (6) impacts wildlife habitat or wildlife populations, (7) impacts species through known ecological interdependencies, and (8) that limits harvest for subsistence use.

   a. All plant NTFPs are inventoried, and their populations are monitored to assure the maintenance of minimum, viable populations. Up-to-date management plans are written and maintained for each plant NTFP species. Animal NTFPs are managed under a wildlife management plan. Potential impacts of the use and harvest of NTFPs are documented, including environmental and economic impacts that have resulted and that might result from timber management operations.

   b. Enrichment plantings of plant NTFPs is encouraged, particularly in areas where populations have been depleted by previous collection, management activities, and/or disturbances. Locally collected materials are used for enrichment plantings when available.

   c. Extraction of mineral NTFPs are carried out in an environmentally sensitive and non-degrading manner. Appropriate reclamation is carried out as necessary.

3. Management plans that prioritize timber production include specific provisions to describe and minimize short-term and long-term negative impacts on NTFPs.

a. Appropriate management methods and harvest levels of NTFPs are articulated in the written long-term management plan, using all available biological, ecological, and soil science.

b. Monitoring NTFP populations includes assessment of the regenerative capabilities of each NTFP. Where it is relevant, minimum viable populations of NTFP species are determined. Monitoring includes methods for determining potential impacts that might result from the implementation of management plans in neighboring forests. Forest owners or managers collaborate with adjacent landowners and land managers to establish wildlife corridors, to conserve critical habitats, and to achieve other goals of biological conservation.

4. The management plan addresses the social and economic impacts of NTFP management, including utilization and traditional harvesting practices, and respects the cultural and religious significance of NTFPs to local and indigenous communities.

5. The methods and levels of harvesting NTFP are appropriate to the species or species group, and reflect scientific, local, and indigenous knowledge.

a. The methods of production and harvest of NFTP resources are based on ecological and environmental limitations of the site, and on detailed knowledge of the natural history of the species.

b. Where a detailed scientific account of the natural history of a species is not available, adequate populations of NTFP species and species groups are defined as those that are comparable to natural populations of the region (i.e., populations that are substantially unmodified by human interventions and management).

c. Control areas (i.e., check plots or unmanaged natural populations) are set aside and monitored for each managed NTFP species or species group to provide a sound basis for NTFP management decisions.

6. Monitoring evaluates the impacts of timber management on non-timber resources and the forest ecosystem. Monitoring also evaluates the impacts of managing non-timber resources on timber resources.

7. In addition to the requirements of Criterion 3.4, indigenous and local communities receive fair and adequate benefits for use of their name or image in the process of marketing NTFPs. Whenever local or indigenous knowledge is the basis for an NTFP-related patent or registration, the community whose knowledge is patented or registered receives fair and adequate benefits.

Appendix B - Glossary of terms

Acceptable growing stock (AGS)
: Trees that possess characteristics required for meeting future objectives (ex. AGS for timber would include proper form, vigor, crown, longevity, and species).

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

Aquatic habitat
: A local environment that is in or near water, that provides food, a location in which to reproduce , and shelter to water-dependent species.

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

Biological diversity
: The condition of having a variety of biotic characteristics and traits; including genes, species, life history stages, structural forms (stratification, zonation, and plant physical structures), biotic patterns (reproductive, activity, food web, social, and interactive), community types, and functions.

Biological diversity values
: The value of biotic characteristics based on relative rarity or vulnerability, and for assemblages, richness.

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 adverse impacts of a treatment or action of one area on another. Example: land, usually along a road or waterway, managed to lessen visual or environmental impacts.

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 and among 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 fertilizers, insecticides, fungicides, and hormones that are used in forest management.

Criterion (p.Criteria)

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

Community

A group of organisms consisting of several or many species that co-exists in the same habitat or area, and interacts through trophic and spatial relationships, commonly characterized by one or more dominant species.

Community type

A generalized category comprising a number of similar units or stands of vegetation, which includes 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.

Conversion

The substantial or severe modifications of the physiognomy, structure, and dynamics of a forest as a result of management activities that significant reduce the complexity of the forest system; or the transformation of a forest into permanently non-forested area.

Cumulative effects

Cumulative effects: Individual consequences of an action or repeated actions, which may or may not be observable, that reinforce one another as they occur over time until they cross a threshold and manifest as a stronger outcome than any of the individual consequences would be by themselves

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.

Deferment cutting

A harvest that maintains reserve trees, typically between 10 and 30 ft^2 basal area per acre, while allowing the regeneration of the remainder of the stand. Reserve trees are typically one of the older cohorts in the original stand. These trees are left standing, deferring their removal until the regenerating age class is harvested. This harvest produces a two-age stand, the older reserve trees and the younger regeneration age class.

Ecosystem

A holistic concept of the plants, the animals associated with them and all the physical and chemical components of the immediate environment or habitat that together form a recognizable self-contained entity .

Endangered species

A species officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as having its continued existence threatened over all or a significant portion of its range .

Erosion

The displacement of soil from one place to another by water, wind, gravity, logging, road building, or other means.

Even-aged management

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

Exotic species

Species that occur in a given area, place, or region as a result of direct or indirect deliberate or accidental introduction; not native.

Exotic plant species

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

Ford

An improved stream crossing using a natural solid rock bottom and constructed approaches. The structure is located, constructed, maintained, and retired in a manner to abate erosion while maintaining safe passage across the channel.

Forest

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

Forest integrity

The extent to which the forest is complete (i.e., all naturally occurring species and all plant community types are present) and functional (natural disturbance processes are unimpeded, habitats are viable for native species, and nutrient cycles are in place and functional. **(of course they "leak"!!!!!)**)

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

Organisms that have been modified by splicing genes and/or recombining DNA.

Green retention

Living vegetation, including trees, shrubs, and herbaceous plants, that is maintained during and after a harvest

Group selection

A group of trees up to 2.5 acres in size.

High Conservation Value Forest

High Conservation Value Forests are those that possess one or more of the following attributes:
a) forest areas containing globally, nationally, or regionally 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).

High water mark

The edge of the streambed channel, typically where herbaceous vegetation begins.

Indigenous lands and territories

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

Indigenous peoples

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

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..

Integrated pest management (IPM)

The use of chemical, physical and biological means to control pests, including insects, pathogens, and competition from unwanted vegetation , at levels below pre-established acceptable threshold levels. The use of scouting, low toxicity materials, narrow targeting of pesticides, and minimal environmental impacts are integral to IPM.

Intensive forestry

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

Locally adapted

Seeds, seedlings or other propogative material obtained from within the region where the forest exists. Example: seeds or seedlings available from local or state DNR Agencies.

Landscape

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

Large forest

A forest that is at least 10,000 acres in size.

Local laws

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

Long term

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

Managed forest

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

Mid-sized forest

A forest between 1000 and 9,999 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 among soils, water, plants, and animals in forest environments that affect the ecological productivity of a given site.

Natural forests

Forest areas without documented evidence of human activities (e.g. timber harvesting, cattle grazing, road building, etc.) that retain most of the principal characteristics of native ecosystems, such as a rich diversity of native species and many of the structural components and functional diversity associated with an undisturbed forest.

Nontimber forest products (NTFP)

All forest products except timber, which includes other materials obtained from trees such as resins and leaves, as well as any other plant and 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

Forests over 500 acres in size that have developed without active management and contain a significant number of canopy trees over 100 years old. Broadleaf dominated forests will typically have complex forest structures developed from natural mortality and natural disturbances and contain well-developed understories with late successional (often shade tolerant) species. Conifer dominated stands may or may not have complex structures and well developed understories. Both broadleaf and conifer dominated forests will contain well-distributed course woody debris and a well-developed herbaceous layer consistent with the late successional phase of the forest type.

Old-growth stands

Areas less than 500 acres in size that possess the attributes of old-growth forests.

Other forest types

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

Pathogens

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

Perennial streams

A water body that is designated as a solid blue line on 7.5 minute quads and contains water year round.

Plant community type

A vegetative complex unique in its composition and with boundaries that are recognizable in the field. The composition is a result of environmental influences on the site, such as an available source of seeds, soils, temperature, elevation, solar radiation, slope, aspect, and rainfall.

Plantation

Forest areas lacking most of the principal characteristics and key elements of native ecosystems as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of either planting, sowing, or intensive silvicultural treatments.

Precautionary approach

Tool for the implementation of the precautionary principle.

Principle

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

Public land (public forests)

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

Rancheria

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

Refugium

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

Restoration

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

Regeneration cut

even-aged:

Removal of all trees in a stand, in a single harvest or in several harvests over a short time, to produce stands comprised of trees of the same age. Shade-intolerant tree species are usually managed with even-aged management. For this standard, green retention shall equal 20 square ft basal area per acres.

Uneven-aged:

Removal of trees, individually or in small groups, throughout a stand to create small openings and provide growing space for the remaining trees. Selection of trees to be removed is be based on a combination of factors, but residual stand quality, species diversity, and individual tree quality, are to be maintained (not diminished). Opening size should emulate natural disturbances, which are usually less than 2.5 acres.

Resource manager

An individual or company retained by the landowner, through the execution of a management contract or other legal document, to manage the

landowner's timber resources. The Resource Manager document their ability to manage forests in a sustainable manner through references and other long-term commitments.

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.

Scientifically credible analyses

Scientific opinions supported by data and explanations in articles published in peer-reviewed natural or social science professional journals relevant to the matter in question. Greater depth of analysis should be associated with management decisions to create larger openings. When peer-reviewed studies are not available, scientific data compiled by experts in the field may be substituted. In all cases, management decisions must be based on a review of the science. When necessary to gain clarity and perspective, the U.S. Standards Committee may 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.

Sediment

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

Semi-natural forest(s)

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

Silviculture

The art and science 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 commonly measured in percent as determined by the number of units of change in elevation per 100 of the same measurement units; also characterized by the compass direction in which it faces.

Small forest

Small forest: A forest less than or equal to 1,000 acres, except for the purposes of FSCUS's Family Forest Program (SLIMF) Streamlined Certification Procedures (FSC-POL-20-101 at http://www.fscus.org/documents/) under which a small forest is defined as less than or equal to 2,470 acres.

Snag(s)

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 of 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

A grouping of vegetation sufficiently uniform in species composition, age, and condition to be distinguished from surrounding vegetation types and managed as a single unit.

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 unit of land or the associated resources there within (such as individual trees, plant species, water, minerals, etc).

Threatened species

Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Uneven-age techniques

Techniques that product forest containing 3 or more age classes.

Use rights

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

Water quality

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

Woody debris

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

Appendix C – Elements of a management plan (subcriterion 7.1.a

Management systems
- Statement of vision, goals, and objectives
- Monitoring management effectiveness
- Monitoring forest conditions
- Equipment and personnel needs
- Employee and contractor policies
- Mapping

Ecological and silvicultural systems
Ecological description of forest and landscape
Rationale for selection of silvicultural system
Regeneration/harvest strategies and equipment
- Restoration strategies

Evaluation of environmental impacts
Pest control (vegetation, pathogens, insects, vertebrates)
- Soil and water conservation

Method of harvest calculation by species and product
- Management of sites of special significance
- Riparian management zones
- Representative samples of existing ecosystems
- Rare plant community types (vulnerable, imperiled, critically imperiled)

Rare species (sensitive, threatened, or endangered)
- High Conservation Value Forests

Landscape-level analysis and strategy
- Gap analysis
- Watershed analysis
  - Ecoregional conservation analysis
- Transportation system
- Roads, skid trails, landings
- Stream crossings
- Fish and wildlife and their habitats (including non-game species)
- Hunting, fishing, trapping, and gathering
- Habitat management strategies
- Fire management
  - Fuel load management
- Prescribed fires
- Wildfires

Non-timber forest products
- Methods and annual rates of harvest, by species and products

Regeneration strategies
Socioeconomic issues
- Community relations
- Public access to and use of the forest
- Public input process
- Employee and contractor policies and procedures
- Stakeholder notification

Aesthetic values
Rights
Customary rights
Usufruct rights
American Indian and other indigenous issues
    Protection of legal and customary rights
    Intellectual property
    Integration of tribal concerns into forest management
    Conservation of historical and cultural resources
Archeological elements
Historical elements

Appendix D. Age-Class Distribution and Long-term Sustainability

This indicator assumes that active management through regeneration harvests has produced a variety of age classes across the forest. It may not apply to newly acquired forests or to forests in which regeneration harvests have not been applied. However, this indicator was constructed to assure that the distribution of age classes created by forest operations provides the potential for maintaining sustainable productivity and revenues. This does not necessarily mean that the forest contain a "balanced" age-class distribution, where all age classes are represented. This would be particularly difficult for owners or managers of small forests or for any forest size in which an appreciable portion of the forest is even-aged. In the latter case, or where rehabilitation of the forest is required regardless of size, forest management activities would initially produce a bimodal age-class distribution that will continue for some period of time. It is understood that long-term management of the forest, particularly mid-sized or large forests, will ultimately produce a forest that has a number of different age classes. This indicator is designed to ensure that exploitive harvesting is not occurring and that forest owners or managers create, through proper management, a forest that is capable of providing future revenues at intervals that can maintain protection and management of the forest.

Appendix D
Working Group Members – 1996 – 1999

Appalachia Working Group Members, 1996-1999		
Robert L. Boyles	Assistant District Manager, Ohio Division of Forestry	Economic
Jamison Ervin	FSC US Initiative Coordinator	Staff
George Freeman	CEO, Freeman Corporation	Economic
Donald S. Girton,	National Woodland Owners Association	Social
Than Hitt	Appalachian Restoration Campaign	Social
Michael Jenkins	MACED	Social
Jonathan Kays	University Maryland Cooperative Extension Service	Social
Bill Kittrell	Nature Conservancy	Environmental
Nancy Lynch	Headwaters Charitable Trust	Environmental
William Martin, Ph.D	Kentucky State Commissioner of Department for Natural Resources	Social
Eileen McIllvane	Coalition for Jobs and the Environment	Social
Blain Puller	Kane Hardwoods	Economic
Pam Curry	Center for Economic Options	Social
Don Sanders	Association of Forest Service Employees for Environmental Ethics	Environmental
Joe Savery	Mountain City Lumber Company	Economic
Byron P. shissler	Natural Resource Consultants	Economic
Mark Vodak	Extension Specialist, Rutgers University	Social
Gary L. Walker	Professor Biology, Appalachian State University	Social
Buzz Williams	Executive Director, Chattooga Conservancy	Environmental

Proposed Appendix E, Laws, Rules and Regulations Applicable in Appalachia Region

International Treaties and Agreements to Which the U.S. is a Signatory:

1. Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere (Washington, 1940)
2. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) (2 Feb 1971)
3. Convention for the Protection of the World Cultural and Natural Heritage (16 Nov 1972)
4. Convention concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)
5. Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1973)
6. International Plant Protection Convention (1979 Revised Text) (Rome, 1979)
7. Convention on the Conservation of Migratory Species of Wild Animals (23 Jun 1979)
8. Amendment to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Art.XI) (Bonn, 1979)
9. Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991)
10. Convention for the Conservation of Anadromous Stocks (Moscow, 1992)
11. Agenda 21, United Nations Convention on Environment & Development (UNCED), Rio de Janeiro, 1992. (NI V4.0)
12. Forest Principles, UNCED, 1992. (NI V4.0)
13. Convention on Biological Diversity (5 Jun 1992)
14. Framework Convention on Climate Change, UNCED, 1992. (NI V4.0)
15. International Tropical Timber Agreement (Geneva, 1994)

Federal Laws and Policies:

1. Endangered Species Act.
2. Migratory Bird Treaty Act.
3. Lacey Act (concerning trade in illegally taken fish, wildlife, or plants).
4. Federal Plant Pest Act and the Plant Quarantine Act.
5. Coordinated Framework for the Regulation of Biotechnology, Office of Science & Technology, 19986.
6. Federal Water Pollution Control Act/Clean Water Act.
7. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)/Federal Environmental Pesticide Control Act (FEPCA).
8. Resource Conservation & Recovery Act (RCRA), in relation to hazardous chemicals.
9. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, commonly known as "Superfund").
10. Clean Air Act.
11. National Historic Preservation Act, including in relation to American Indian sites.
12. Occupational Safety & Health Act.
13. Federal policy on income taxes, capital gains taxes, inheritance taxes, reforestation tax credits, and other relevant taxes.
14. Federal business practices law.

State Laws and Policies – Alabama

1. Ala. Code § 9-13-271(a) (1975) prescribed burning practices on private lands
2. Alabama does not have an endangered species act. Instead, using its administrative authority, the state's Natural Heritage Program maintains lists of non-game species it considers endangered, threatened, of special concern or poorly known.
3. Ala. Code §9-2-2 (1), policy to protect, conserve and increase the wildlife of the state.
4. Alabama Water Pollution Control Act
5. Non-mandatory - Alabama's Best Management Practices for Forestry, 1993, Reprinted 1999 by Alabama Forestry Commission.
6. Aboriginal Mounds, Earthworks and Other Antiquities (Alabama Code §41-3-1 to §41-3-6); Alabama Cemetery and Human Remains Protection Act (93-905); Burials (Alabama Historical Commission Chapter 460-x-10).
7. 13A-7-23.1 Code of Alabama 1975, as amended by Act No. 93-770, H 367,1993 Regular Session, to provide further for procedures for the lawful preservation, restoration, or relocation of any tomb, monument, structure, or human remains.

State Laws and Policies – Arkansas

1. Non-mandatory - Arkansas Forestry Best Management Practices For Water Quality Protection. March, 2002.
2. Ark. Reg. 18.20, Regulations prohibit trafficking in endangered species but do not require their recovery
3. Ark. Reg. 18.01.00-c, has listed species include state and federally listed species of plants and animals
4. Ark. Code Ann. §2-16-207, Plant Act restricts introductions of plants and insects
5. Act 58 of 1967Arkansas State Antiquities Act, , An Act For The Protection And Preservation Of Arkansas' Archeological Heritage, Its Antiquities, Artifacts And Sites, And For Other Purposes.
6. Act 753 of 1991, An Act To Be Entitled "An Act To Prohibit The Desecration Of Human Skeletal Burial Remains In Unregistered Cemeteries; To Prohibit Trade Or Commercial Display Of Human Skeletal Burial Remains Or Associated Burial Furniture; And For Other Purposes."

State Laws and Policies - Georgia

1. The Georgia Water Quality Control Act (O.C.G.A. 12-5-29)
2. The Georgia Growth Planning Act (O.C.G.A. 12-2-8)
3. Water Supply Reservoir/Watershed (Chapter 391-3-16-. 01)
4. Wetlands Protection Act (Chapter 391-3-16-. 03)
5. River Corridor Protection Act (Chapter 391-3-16-. 04)
6. Mountain Protection Act (Chapter 391-3-16-. 05)
7. Georgia Forest Fire Protection Act (O.C.G.A. 12-6-90)
8. Erosion and Sedimentation Act (O.C.G.A. 12-7-1)
9. Oil or Hazardous Material Spills or Release Act (O.C.G.A. 12 -14-1)

10. State Board of Registration for Foresters Standards of Practice (O.C.G.A. 43-1-19) Chapter 220-5.01
11. Georgia's Best Management Practices for Forestry, both Mandatory and Non mandatory
12. Ga. Code Ann. §§27-3-130 et seq.; §§12-6-171 et seq, separate laws covering endangered plants and animals.
13. Ga. Code Ann. §12-16-1 et seq., requiring agency analysis of environmental consequences of major agency actions.

State Laws and Policies - Kentucky

1. KRS Chapter 149.342 Timber harvesting operations -- Master logger training and educational requirements -- Temporary master logger designation and requirement to use master loggers for any and all timber harvest in Kentucky
2. KRS Chapter 149.344 Use of appropriate best management practices -- Violation -- Noncompliance -- Administrative regulations governing bad actor designation.
3. Kentucky Forest Practice Guidelines for Water Quality Management, revised 2001.
4. KRS 224.71, Kentucky Agriculture Water Quality Act.
5. 401 KAR 5:026 and 401 KAR 5:029-5:031, Regulatory Requirements for All Silvicultural Operations.
6. 401 KAR 4:100-140, Activities near Wild Rivers
7. KRS 151:250, Debris and logging slash near perennial streams > 1 sq. mi. in size.
8. KRS 433.870-875, Activities around sinkholes and Cave Entrances.
9. KY Rev. Stat. Ann. §146.410, importance of unique natural areas and the protection and conservation of wildlife
10. KRS. §§150.183, 150.990, 146.600-.619 regulating endangered plants and animals.
11. KRS. §146.610 establishing the State Natural Heritage Program.
12. KRS. §§250.021 to 250.111, controlling noxious seeds
13. KRS. §249.410, providing for the eradication of noxious weeds and Invasives.
14. KRS §164.705 through §164.735, policy of the commonwealth to preserve archeological sites and objects of antiquity

State Laws and Policies – Maryland

1. Natural Resources Article 5-1601–1612, Maryland Forest Conservation Act (FCA) was passed in 1991 to protect the state's forest resources during development. Compliance is required for any project for which grading is required on a unit of land 40,000 ft'
2. Title 5, State of Maryland Reforestation Law,
3. Title 5, Section 608, Annotated Code of Maryland, any person engaged in a forest products business must have a license issued by the Department of Natural Resources.
4. Title 5, Subtitle 4, Part III. Tree Experts – requires licensed forest professionals
5. Code of Maryland, Art. 83B, §5-621, and Art. 83B, §5-626 through 83B, §5-631, historic terrestrial objects and remains, and caves.
6. Md. Code. Ann, Agric. §§8-102 et seq. to provide for the conservation of the soil, water and related resources in order to preserve natural resources.
7. Md. Code Ann., Nat. Res. §§10-2A-01 to 09; 4-2A-O1 to 09, two laws that together protect endangered and threatened species of plants and animals

8. Md. Code Ann., Nat Res. §§1-301 et seq, requiring assessment of major proposed agency impacts on biological resources
9. Md. Code Ann., Agric. §§9-202, 9-402, 404, Exotic plants are regulated by the Department of Agriculture under weed control laws
10. Maryland Riparian Forest Buffer Design and Maintenance, June 2005.

State Laws and Policies – Mississippi

1. Miss. Code Ann. § 49-19-303(c)(1)(f), (2), statute authorizes and promotes the use of prescribed burning for ecological, silvicultural and wildlife management purposes.
2. Statute 49-17-29, Miss. Code, (1972), regulating the pollution of or degradation to the state's waters
3. Best Management Practices for Forestry in Mississippi, 2000. Non-regulated guidelines.
4. Miss. Code Ann. §§49-5-1O1 et seq., Non-game and Endangered Species Conservation Act that protects species and subspecies of animals, but not plants.
5. Miss. Code Ann. §39- 7-11, Antiquities Law of Mississippi: designation of sites, objects, etc. upon lands belonging to state or political subdivisions as Mississippi Landmarks.

State Laws and Policies – New Jersey

1. Title 23 Fish And Game, Wild Birds And Animals
2. Title 34 Labor And Workmen's Compensation
3. N.J. Stat. Ann. § 13:1L-15, Policy on the spread of insects and diseases through trees and forests of the state or through wood products, stored wood and wood in use.
4. N.J. Stat. Ann. § 13:1L-17.2, New Jersey Shade Tree and Community Forestry Assistance Act
5. N.J. Stat. Ann. §523:2A-1: et seq., Endangered and Non-game Species Conservation Act, that protects species and subspecies of indigenous wildlife
6. N.J. Stat. Ann. §13:1B-15.151, Endangered Plant Species List Act.
7. N.J. Stat. Ann. §§13:9B-1 et seq., Freshwater Wetlands Protection Act.

State Laws and Policies – New York

1. N.Y. Ed. Law §235-a, Biodiversity Law
2. N.Y. Envtl. Conser. Law §11-0535, endangered species law that protects wild animals, plants and significant habitats
3. N.Y. Envtl. Conser. Law §8-0109, State Environmental Quality Review Act
4. N.Y. Const art.14, §§1, 4, constitutional provisions designed to preserve wildlife habitat
5. New York State Forestry Best Management Practices for Water Quality BMP Field Guide, January, 2000.
6. New York State Historic Preservation Act of 1980 (Chapter 354 of the Laws of 1980)

State Laws and Policies – North Carolina

1. NC General Statutes (G.S.) Chapter 113A - Article 4 Sedimentation Pollution Control Act of 1973
2. Rule, 15 NCAC 1I.0101 - .0209. Forest Practices Guidelines
3. Rule, 15 NCAC 2B .0211-Fresh Surface Water Classifications and Standards

4. 15 NCAC 2B .0200-Classifications and Water Quality Standards Applicable to Surface Waters of North Carolina,
5. 15 NCAC 2L .0200 -Classifications and Water Quality Standards (related to groundwater).
6. N.C. Gen. Stat. §§113-331 et seq; 106-202.12, separate laws to protect plants and animals
7. N.C. Gen. Stat. §§113A-1 et seq., State Environmental Policy Act
8. N.C. Gen. Stat. §§106-65.45 et seq. North Carolina Biological Organism Act regulates the importation, rearing, sale and release of insects, parasites, predators and other organisms in the state
9. N.C. Gen. Stat. §§106-277.5 et seq. North Carolina Seed Law prohibits the transport or sale of agricultural or vegetable seeds containing noxious weed seeds.
10. N.C. Gen. Stat § 70-10 through § 70-20 Archeological Resources Protection Act:
11. N.C. Gen. Stat § 70-26 through § 70-52 Unmarked Human Burial and Human Skeletal Remains Protection Act

State Laws and Policies – Ohio

1. Ohio State University Extension Bulletin 196, Best Management Practices for Logging Jobs in Ohio, 1992. (Non-mandatory BMPs for logging).
2. Ohio Rev. Code Ann. §§1531.25, .26; 1531.99, endangered species laws to protect animals and plants
3. Ohio Rev. Code Ann. §731.51, noxious weeds are required to be removed on lands owned by a municipal corporation
4. Ohio Rev. Code Ann. § 149.51, State registry of archeological landmarks
5. Ohio Rev. Code Ann. § 149.53-§ 149.56, Survey and salvage; discoveries; preservation
6. Ohio Rev. Code Ann.§1517.21 through §1517.99, cave protection
7. Ohio Rev. Code Ann.§2927.11, Desecration of any historical or commemorative marker, or any structure, Indian mound or earthwork, cemetery, thing, or site of great historical or archeological interest.

State Laws and Policies – Pennsylvania

1. Article 1, Section 27 of the Pennsylvania Constitution establishing State Forests.
2. 3930-BK-DEP2322 Rev. 4/2003, Controlling Erosion And Sediment From Timber Harvesting Operations.
3. Chapter 102 of Department of Environmental Protection (DEP) Rules and Regulations under the authority of the Clean Streams Law. Under these regulations, all earth moving or earth disturbance activities, regardless of size, must have a plan developed, implemented and maintained which will minimize erosion and prevent sediment pollution to the waters of the Commonwealth. Timber harvesting operations proposing earth disturbance activities of 25 or more acres require a permit from DEP.
4. Chapter 105 Rules and Regulations adopted under the provisions of the Dam Safety and Encroachments Act and the Fish and Boat Code . Act 175. The Chapter 105 Regulations govern the crossing of streams; construction of culverts, fords and bridges, and other impacts to water courses that occur during man-made activities. Commonly used General Permits are GP#7 . Minor Stream Crossings and GP#8 . Temporary Road Crossings.

5. Pa. Stat. Ann. title. 52, §30.51, statutory and regulatory policies acknowledging the importance of ecosystems and wildlife.
6. 30 Pa. Cons. Stat. Ann. §2305; 25 Pa. Code §§82.31 et seq.; 34 Pa. Cons. Stat. Ann. §2167, separate laws protecting endangered species of animals, plants and fish
7. 25 Pa. Code. §§9.151, 9.161, state policy to manage water and air resources so that aquatic and other ecosystems are maintained.
8. Pa. Stat. Ann. tit. 3, §§255.1 et seq.; 258.1 et seq. Noxious weeds, seeds and plant pests are regulated through permitting, inspection and quarantine measures
9. 34 Pa. Cons. Stat. Ann. §2161, statute for wildlife, including habitat for wildlife.
10. Pa. Const. art. l, §27, citizens "have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and aesthetic values of the environment.
11. Title 9 P.S. §202 through §215, Historic Burial Places Preservation Act.
12. Title 32 P.S. §5602 through §5607, Cave Protection Act
13. Title 37 Pa.C.S.A. §506, Archeological field investigations on commonwealth land
14. Title 37 Pa.C.S.A. §512, Enforcement of historic preservation laws and policies

State Laws and Policies – Tennessee

1. Tenn. Code Ann. §§11-14-101 et seq., Natural Areas Preservation Act
2. Tenn. Code Ann. §§70-8-101 et seq., “Endangered Species Act”
3. Tenn. Code Ann. §§70 8-301 et seq., Rare Plant Protection and Conservation Act
4. Tenn. Code Ann. 9943-10-101 et seq., sale and distribution of noxious weeds
5. Teen. Code Ann. §70-4-206, statute that regulates pollution that is injurious to aquatic life or which destroys aquatic habitat.
6. Tenn. Code Ann. § 11-4-801 (1986), establishing state forests
7. Tennessee’s Water Quality Control Act (TCA 69-3-101)
8. Water Quality Control Act section TCA 69-3-120g exempting agriculture and silviculture (forestry) activities from general permitting requirements
9. Non-Mandatory Guide to Forestry Best Management Practices in Tennessee, 2003. Tennessee Department Of Agriculture Division Of Forestry
10. Tenn. Code Ann. §§11.1-101 to §§11.1-119, Archaeological Statutes.

State Laws and Policies – Virginia

1. Chapter 11 of Title 10.1 of the Code of Virginia, Silvicultural Activities Affecting Water Quality
2. State of Virginia mandatory BMPs for road construction and maintenance (per Section 404(f) of the Federal Water Pollution Control Act)
3. Forestry Best Management Practices for Water Quality in Virginia Technical Guide
4. “Section 4.2.10 of the Regulations” regarding silvicultural operations in Chesapeake Bay Preservation Areas.
5. “Debris in Stream Law”, S62.1-194.1 and 62.1-194.2.
6. § 58.1-1609. Payment, collection, and disposition of forestry taxes
7. . § 10.1-1177. Authority of Department of Forestry.
8. § 10.1-1105. Additional powers and duties of State Forester with respect to wildlife
9. § 10.1-2304. Designating archaeological sites and zones

10. § 3.1-1025. Powers and duties of Board; listing of rare species; further powers of Commissioner.
11. § 29.1-566. Regulations [of T&E species]
12. § 29.1-564. Taking, transportation, sale, etc., of endangered species prohibited.

State Laws and Policies – West Virginia

1. §19-1B-1, "Logging Sediment Control Act."
2. W.Va. Code §22-13-2 Natural Streams Preservation Act declares that it is state policy to preserve free flowing streams that have fish, wildlife or botanical values.
3. W.Va. Code §20-3-2, Department of Natural Resources must by statute manage lands for the protection, management, propagation and distribution of wildlife
4. W. Va. Code §20-2-5c, Eagle protection act prohibits the taking of bald and golden eagles. West Virginia does not have an endangered species law
5. W.Va. Code §20-2-1, State policy is to protect all species of wildlife "for values which may be either intrinsic or ecological or of benefit to man.
6. W.Va. Code §§19-12-2 et seq. Plant Pest Act, a noxious weed act and seed laws control exotic species.
7. W.Va. Natural Resources Law (20-1-1), a comprehensive program for the exploration, conservation, development, protection, enjoyment and use of the natural resources.
8. W.Va. Code §20- 7A-5, Archeology; permits for excavation; how obtained; prohibitions; penalties
9. W.Va. Code 29- 1- 8a (a)-(h), protection of human skeletal remains
10. W.Va. Code §29-1-8 and §29-1-8a, Regulation of historic and prehistoric landmarks, sites and districts identified by the Historic Preservation Section of the Division of Culture and History, on lands owned or leased by the state, or on private lands where investigation and development rights have been acquired by the state by lease or contract.