Regional Variation in Timber Harvest Limits

Forest Stewardship Council (FSC) forest management indicators allow the use of silvicultural systems – including clearcuts – that are scientifically warranted to regenerate the forest cover types being managed. Clearcuts are, however, a sensitive topic for many FSC stakeholders.

The high level of concern about harvest opening sizes and tree retention was clearly displayed in the original nine FSC-US regional standards that were developed by local working groups in 1995-2008. When the regional standards were unified into the FSC-US Forest Management Standard adopted in 2010, most of the elements of the individual regional versions were combined into one set of indicators. One of the primary exceptions, however, was in regard to clearcuts. To expedite the standard revision process, variability in respect to opening size limits for harvests was carried over for those regions that were not ready to change.

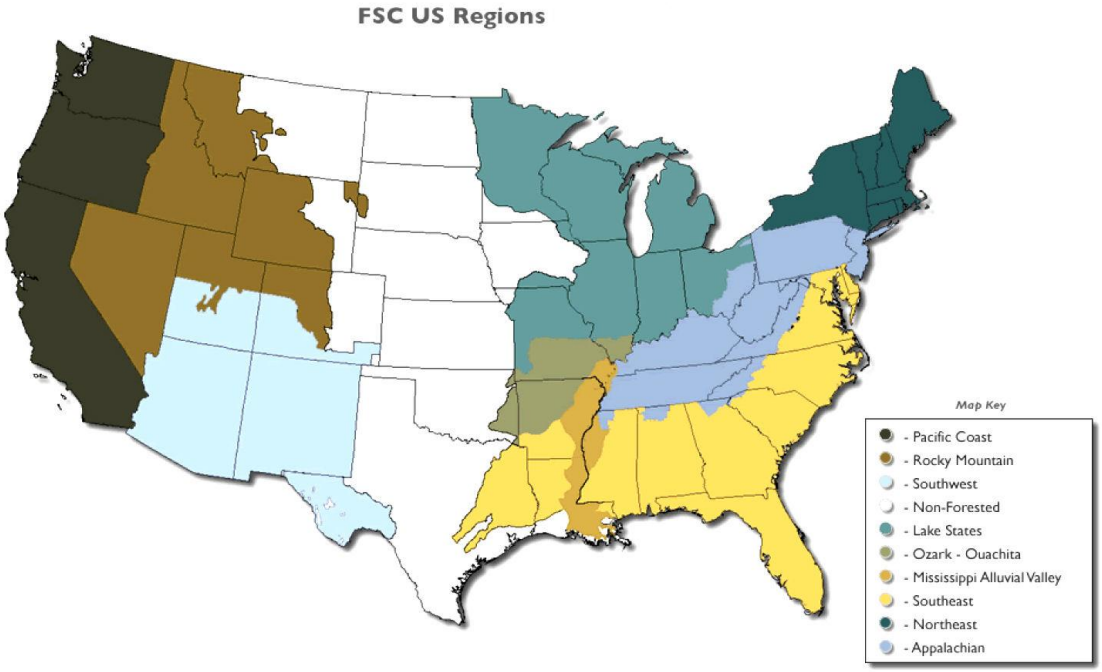

Figure 1. FSC-US Regions

Appendix C of the FSC-US Forest Management Standard details opening size considerations for the nine FSC-US Regions. In some instances, the regional language establishes mandatory limits, while other sections are advisory. To simplify the distinctions, Tables 1-3 of this factsheet summarize the main differences for natural and "semi-natural" forests. In addition, Table 4 compares regional differences in opening size restrictions for more regimented plantations (typically non-native species or clonal stock) that fall under FSC Principle 10.

Starting with the most basic differences, four of the FSC-US Regions specify even-aged silvicultural system openings sizes under which no tree retention is required. They also set maximum clearcut size limits as shown in Table 1.

Table 1. Elementary Differences in FSC-US Regional Mandatory Clearcut Size Restrictions in Natural or Semi-Natural Forests (Note: See Table 4 for Principle 10 Plantation Opening Size Variations)

Region	Clearcut Size Under Which No Retention Is Required	Maximum Clearcut Size
Appalachia	10 acres	
Ozark-Ouchita (Ozark sub-region)	2 acres	20 acres
Ozark-Ouchita (Ouchita sub-region)		20 acres
Mississippi Alluvial Valley	20 acres	40 acre average
Pacific Coast	6 acres	40 acre average, but no block larger than 60 acres

Regions that do not specify limits default to the requirements in FSC-US Indicator 6.3.f. It requires retention of trees "*in abundance and distribution that could be expected from naturally occurring processes"*. These components include:

a) Large live trees, live trees with decay or declining health, snags, and well-distributed coarse down and dead woody material. Legacy trees[1] where present are not harvested; and
b) Vertical and horizontal complexity

Trees selected for retention should generally be representative of the dominant species naturally found on the site.

The intent of the indicator is to ensure that forest managers provide adequate habitat for species associated with large trees or decaying trees and dead wood. The expectation applies to all stands, silvicultural systems, and harvest objectives. That includes normal operations, salvage harvests, intermediate, and final harvests and stands regenerated by natural means or by planting. While species selected for retention should be generally representative of the species found on the site, flexibility in the proportions of species retained may be based on ecological and financial objectives. Other indicators also allow retention at lower levels if necessary for purposes of forest stand restoration or rehabilitation.

While individual certificate holders in other regions must retain trees in patterns that could be expected from naturally occurring processes, they are not prevented from establishing comparable acreage thresholds to help make decisions easier. Like the four regions in Table 1, an individual forest management entity elsewhere in the U.S. could adopt distinct opening size parameters based on credible analysis of ecological, social and economic considerations.

[1] **Legacy Tree**: A tree, usually mature or remnant of old growth, that provides a biological legacy. For the purposes of this Standard, it is an individual old tree that functions as a refuge or provides other important structural habitat values.

Going beyond the basic differences noted above, Table 2 provides an expanded summary of mandatory regional harvest limits. Some of the provisions apply only to even-aged silvicultural systems, while others are general harvest and uneven-aged system guidelines.

Table 2. Mandatory FSC-US Regional Harvest Limits

Region	Mandatory Limits	
	Even-aged Stands and/or General Requirements*	**Uneven-aged Stands**
Appalachia	Harvests >10 acres require tree retention consistent with natural disturbance patterns. Retained trees may be focused in riparian buffers or other special zones. Retention flexibility allowed for silvicultural purposes related to stand restoration.	In individual tree or group selection methods, canopy opening are kept < 2.5 acres.
Ozark-Ouchita (Region-wide)	Even-aged harvests are limited to 10% of the timber producing area per decade.	
Ozark-Ouchita (Region-wide)	*Diameter-limit cuts are prohibited. High grading and complete removal of low-grade trees is not allowed.	
Ozark-Ouchita (Region-wide)	*Tree planting allowed only when necessary for restoring specific habitats, stand types or species. Otherwise, natural regeneration should be used.	
Ozark-Ouchita (Region-wide)	*Managers must "take into account" maintenance of high quality seed trees in the stand, use of fire to promote regeneration of fire controlled species in pine types, and adequacy of advanced regeneration before harvest in hardwood types.	
Ozark-Ouchita (Ozark sub-region)	Harvests >2 acres require tree retention consistent with natural disturbances.	
Ozark-Ouchita (Ozark sub-region)	Partial (shelterwood) harvests that retain ≤ 30% of the canopy are limited to 20 acres.	

Region	Mandatory Limits	
	Even-aged Stands and/or General Requirements*	**Uneven-aged Stands**
Ozark-Ouchita (Ouchita sub-region)	Even-aged harvest openings limited to ≤ 20 acres. Trees must be retained consistent with natural disturbance patterns unless retention at a lower level is necessary for restoration purposes.	
Mississippi Alluvial Valley	Harvests >20 acres (including adjacent clearcuts that add up to more than 20 acres) require tree retention consistent with natural disturbance patterns unless retention at a lower level is necessary for restoration purposes. For most stand types, expected retention is 20-30% of original stocking.	
Mississippi Alluvial Valley	*The average regeneration harvest area is no larger than 40 acres.	
Pacific Coast	Harvests >6 acres require retention of 10-30% of pre-harvest basal area across all size classes. The higher level is needed if the trees are still vigorously adding growth (haven't reached culmination of mean annual increment).	
Pacific Coast	The average regeneration harvest area is no larger than 40 acres. No individual block is larger than 60 acres.	
Pacific Coast	Use of even-aged methods approved for native species restoration or to restore natural structural diversity in the landscape.	
Pacific Coast	Snags are protected if necessary with green tree retention to prevent blow-down.	

Region	Mandatory Limits	
	Even-aged Stands and/or General Requirements*	**Uneven-aged Stands**
Pacific Coast	Native hardwoods and understory vegetation are retained as needed to maintain and/or restore the natural mix of species and forest structure.	
Pacific Coast	Adjacent stands can't be harvested until regeneration is at least five feet tall or there has been a five-year wait.	
Rocky Mountain	Use even-aged techniques only when suitable to the timber type or for restoration purposes.	
Rocky Mountain	*Highgrade logging not allowed.	
Rocky Mountain	*Minimize fragmentation with appropriate sale design and retention practices.	
Southwest	*Maintain/restore 3 or more snags per acre, including larger sizes and dominant species.	

The regional harvest provisions carried into Appendix C of the current FSC-US Standard also include optional guidance shown in Table 3. While advisory, forest management entities should be prepared to defend variances.

Table 3. FSC-US Regional Harvest Limit Guidance (Advisory)

Region	Guidance (Optional, but variances should be justified)	
	Even-aged Stands and/or General Guidance	**Uneven-aged Stands**
Mississippi Alluvial Valley	Even-aged silviculture is recommended for most timber types, although uneven-aged management is allowed for all but the most shade intolerant species.	Canopy openings should be < 3 acres.

Region	Guidance (Optional, but variances should be justified)	
	Even-aged Stands and/or General Guidance	**Uneven-aged Stands**
Pacific Coast	Recommended retention levels: ~10 tons per acre on dry sites; ~20 tons per acre on wet sites. Logging debris should be well-distributed with ≥ four large pieces (20" diameter and 15' long) per acre.	
Pacific Coast	3-10 snags per acre should be retained or recruited in a variety of sizes and conditions.	
Southeast	Harvesting "not allowed" (non-binding) in primary forests (old growth stands)	
Southeast	Clear cutting "not allowed" (non-binding) in semi-natural forests great than 100 years old.	
Southeast	Opening in hardwood and cypress clearcuts should be "conservative".	
Southeast	Opening sizes in pine or pine/hardwood stands should not be larger than allowed for Principle 10 plantations (generally, not more than a 40 acre average with an 80 acre maximum without retention) and should be justified for regeneration purposes.	
Southeast	Clearcuts should generally be constrained to <40 acres, although clearcuts up to 80 acres are allowed if necessary for a commercially operable sale or for ecological purposes. Larger harvests over these limits are possible with silvicultural/ecological justification.	
Northeast	Choose silvicutural systems that favor natural regeneration and protect established regeneration of desirable species.	

Region	Guidance (Optional, but variances should be justified)	
	Even-aged Stands and/or General Guidance	**Uneven-aged Stands**
Southwest	Choose silvicutural systems that favor natural regeneration and protect established regeneration of desirable species.	
Southwest	Tree planting of non-native species is discouraged.	
Southwest	Ensure the presence of advanced regeneration prior to harvest as appropriate.	
Southwest	Size of harvest openings should be based on sound silvicultural principles.	
Southwest	Minimize fragmentation with appropriate sale design and retention practices.	
Southwest	Retain trees consistent with natural disturbances and biodiversity needs.	
Southwest	Choose a silvicultural system appropriate for the timber type.	

Harvest Opening Restrictions Related to Principle 10 Plantations

Special considerations apply to Principle 10 Plantations, which are more regimented or made up of blocks of exotic trees (like Eucalyptus plantings in the United States), cloned trees lacking natural genetic variation and other types of forest trees that lack traits of natural forests. FSC-US Standards adopted in 2010 include regional variation in harvest limits for Principle 10 plantations as shown in Table 4.

Table 4. Regional Variation for Harvests in Principle 10 Plantations

Region	Clearcut Size Under Which No Retention Is Required	Maximum Clearcut Size
All Except the Pacific Coast	40 acre average, but no block larger than 80 acres.	Openings may be larger than 80 acres if they are based on credible scientific analysis and include retention. The average for all openings (with and without retention) shall not exceed 100 acres. Departures from these limits for restoration purposes are permissible but also must be justified by credible scientific analysis.
Pacific Coast	A minimum average of four dominant and/or co-dominant trees and two snags per acre must be retained in all openings. Where sufficient snags do not exist, they must be recruited.	Openings may be larger than 80 acres if they are based on credible scientific analysis and include retention. The average for all openings (with and without retention) shall not exceed 100 acres. Departures from these limits for restoration purposes are permissible but also must be justified by credible scientific analysis.

Region	Clearcut Size Under Which No Retention Is Required	Maximum Clearcut Size

Region	Greenup Requirement
All Except the Southeast	Before an area is harvested, regeneration in adjacent forested areas (either natural forest or plantation) on the FMU must be of the subsequent advanced successional habitat stage, or exceed ten feet in height, or achieve canopy closure along at least 50% of its perimeter.
Southeast	For hardwood ecosystems, regeneration in previously harvested areas reaches a mean height of at least ten feet or achieves canopy closure before adjacent areas are harvested. For southern pine ecosystems, (e.g. upland pine forests, pine flatwoods forests, sand pine scrub), harvest areas are located, if possible, adjacent to the next youngest stand to enable early successional or groundcover-adapted species to migrate across the early successional continuum.

For additional information about Principle 10 Plantations, see FSC-US Factsheet *Questions and Answers for Family Forest Owners - Forest Plantations*.