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**Forest Service Handbook 1909.12 – Land Management Planning Handbook
Chapter 60 - Forest Vegetation Resource Management**

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Digest: Following is an explanation of the changes throughout the directive by section.

Zero code: Revises chapter in its entirety.

08: Displays major statutes, regulations, and guidelines needed to carry out the procedures in this Handbook. Replaces chapter 9 of 08/03/1992.

10: Changes chapter caption from “Land Management Plan” to “The Assessment.” Revises the chapter in its entirety. Changes captions and sets forth new direction throughout the chapter.

10.5: Establishes code, caption, and sets forth new terminology in “Definitions.”

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10.6: Establishes code, caption, and sets forth new cited “References.”

14: Establishes code, caption, and sets forth new direction for “Assessing Designated Areas. This chapter describes the procedures for writing an assessment to develop, amend, or revise land management plans. See FSH 1909.12, zero code, for a discussion of the adaptive planning framework (assessment, planning, and monitoring) of the Planning Rule.

20: Changes chapter caption from “Adaptive Planning Process” to “Land Management Plan.” Revises chapter in its entirety.

28 through 28.3: Removes codes, captions, and obsolete direction.

29 through 29.2: Removes codes, captions, and obsolete direction.

30: Revises chapter in its entirety. Changes chapter caption from “Public Participation and Collaboration” to “Monitoring.” Removes codes, captions, and obsolete direction and establishes codes, captions, and sets forth new direction throughout the chapter.

40: Changes chapter caption from “Science and Sustainability” to “Public Participation.” Revises chapter in its entirety.

50: Revises direction throughout the entire chapter. Reorganizes direction and changes captions thought the chapter.

51.5 through 51.8: Establishes codes, captions, and sets forth new direction on the objection process involving comments, resolution of objections, and maintaining records.

60: Revises chapter in its entirety.

70: Revises chapter in its entirety. Removes codes, captions, and obsolete direction and establishes codes, captions, and sets forth new direction throughout the chapter.

80: Revises chapter in its entirety. Removes codes, captions, and obsolete direction and establishes codes, captions, and sets forth new direction.

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This chapter provides procedural direction for the evaluation of timber and forest vegetation resources and the development of plan components in Forest, Grassland, and Prairie, or other comparable Administrative Unit plans. This handbook provides guidance to meet the requirements in 36 CFR 219.11 in the following order:

1. Identification of lands as not suited and suited for timber production.
2. Timber harvest for purposes of timber production.
3. Timber harvest for purposes other than timber production.
4. Limitations on timber harvest.
5. Land Management Guidance including display of forest vegetation management practices and timber harvest levels (36 CFR 219.7(f)(iv)).

This chapter provides guidance for developing land management plans, rather than guidance for individual projects. All projects and activities must be consistent with applicable plan components.

60.1 – Authority

The following law and regulation set forth the requirements for Forest Service planning:

1. Renewable Resource Planning Act of 1974 as amended by the National Forest Management Act of 1976 (16 U.S.C. 1600 et seq.). This act as amended sets forth the requirements for land management plans in the National Forest System. See FSM 1920 for specific requirements.
2. Title 36, Code of Federal Regulations, Part 219—Planning, Subpart A—National Forest System Land Management Planning (36 CFR part 219), published in the Federal Register on April 9, 2012 (77 FR 21162). This regulation provides direction on land management planning procedures on National Forest System (NFS) lands.

60.3 – Policy

Harvest of timber on National Forest System lands occurs for many different reasons, including ecological restoration, community protection in wildland-urban interfaces, habitat restoration, protection of municipal water supplies; and to contribute to economic sustainability through the production of timber, pulp for paper, specialty woods for furniture, and fuel as a renewable energy source. Timber harvest, whether for wood production, restoration, or other reasons, can support local businesses and employment.

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Use this chapter in concert with Title 36, Code of Federal Regulations, part 219 (36 CFR part 219); the National Forest Management Act (NFMA), Title 16 U.S.C. 1604 and 1611; FSM 1900, and FSM 1920. Timber resource planning objectives, policies, and responsibilities are found in FSM 2410. Guidance on development of plan components for vegetation is found throughout chapter 20 of FSH 1909.12 and specifically for timber in section 23.22f.

60.5 – Definitions

Clearcutting. A regeneration harvest method that removes essentially all trees in a stand producing a fully exposed microclimate for the development of a new age class of trees. A clearcut may or may not have reserve trees left to attain goals other than regeneration.

Culmination of mean annual increment of growth. See “Mean annual increment of growth.”

Even-aged stand. A stand of trees composed of a single age class (36 CFR 219.19).

Even-aged system. A planned sequence of treatments designed to maintain and regenerate a stand with predominantly one age class. The range of tree ages is usually less than 20 percent of the rotation (length in years). Treatments include clearcutting, seedtree, shelterwood, and coppice regeneration methods.

Final regeneration harvest. The final timber harvest in a sequence of harvests designed to regenerate a timber stand or release a regenerated stand. A final regeneration harvest could be a clearcut, removal cut of a shelterwood or seedtree system, or a selection cut.

Forest land. Land that is at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for nonforest uses. Land developed for nonforest use includes areas for agricultural crops, improved pasture, residential or administrative areas, roads of any width and adjoining road clearing, and powerline clearing of any width (36 CFR 219.19).

Fuelwood. Wood used for conversion to some form of energy.

Growing stock. All trees growing in a forest or in a specified part of it, usually commercial species, meeting specified standards of size, quality, and vigor, and generally expressed in terms of trees per acre, density, or volume.

Land that may be suitable for timber production. A preliminary classification in the process of determining lands that are suited for timber production. This preliminary classification excludes National Forest System lands that are not suitable for timber production based on the factors identified in 36 CFR 219.11(a)(1)(i), (ii), (iv), (v), and (vi),

and is made prior to the consideration of the factor at 36 CFR 219.11(a)(iii), which identifies suitability based on objectives and desired conditions established by the plan for those lands.

Management practices (Vegetation management practices). Silvicultural practices such as reforestation, prescribed fire, thinning to reduce stand density, and other practices designed to facilitate growth and development of trees.

Management intensities. The set and schedule of management practices typically used for certain forest or timber types to achieve desired conditions that may include timber production.

Mean annual increment of growth and culmination of mean annual increment of growth. The mean annual increment of growth is the total increment of increase of volume of a stand (standing crop plus thinnings) up to a given age divided by that age. The culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, the mean annual increment of growth is expressed in cubic measure and is based on the expected growth of stands according to intensities and utilization guidelines in the plan (36 CFR 219.19).

Nonforest land. Lands that do not meet the definition of forest land.

Projected timber sale quantity (PTSQ). The estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity (PWSQ), the projected timber sale quantity includes volume from timber harvest for any purpose from all lands in the plan area based on expected harvests that would be consistent with the plan components. The PTSQ is also based on the planning unit's fiscal capability and organizational capacity. PTSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

Projected wood sale quantity (PWSQ). The estimated quantity of timber and all other wood products that is expected to be sold from the plan area for the plan period. The PWSQ consists of the projected timber sale quantity as well as other woody material such as fuelwood, firewood, or biomass that is also expected to be available for sale. The PWSQ includes volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components. The PWSQ is also based on the planning unit's fiscal capability and organizational capacity. PWSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

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Reasonable assurance. A judgment made by the Responsible Official based on best available scientific information and local professional experience that practices based on existing technology and knowledge are likely to deliver the intended results. Reasonable assurance applies to average and foreseeable conditions for the area and does not constitute a guarantee to achieve the intended results.

Regeneration harvest. Any removal of trees intended to assist in the regeneration of a new age class or to make regeneration of a new age class possible. Regeneration harvest may be through even-aged or uneven-aged methods.

Restocked. The condition of the growing space occupancy of trees to be achieved after a disturbance that has substantially altered the existing stocking (see definition of “Stocking”).

Rotation. The number of years (including the regeneration period) required to establish and grow timber under an even-aged management system to a specified condition or maturity for regeneration harvest.

Salvage harvest. The removal of dead trees or trees damaged or dying because of injurious agents, other than competition, that recovers economic value that would otherwise be lost, or because the removal of the dead or damaged trees contributes to achieving plan desired conditions or objectives.

Stand. A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands.

Stocking. An indication of growing space occupancy of trees relative to plan-defined desired conditions for the stand or area. Common indices of stocking include the number of trees by size and spacing, percent occupancy, basal area, relative density or crown completion factor.

Suitability of lands. A determination made regarding the appropriateness of various lands within a plan area for various uses or activities, based on the desired conditions applicable to those lands. The terms suitable and suited and not suitable and not suited can be considered the same.

Sustained yield limit (SYL). The amount of timber, meeting applicable utilization standards, “which can be removed from [a] forest annually in perpetuity on a sustained-yield basis” (NFMA at section 11, 16 USC 1611; 36 CFR 219.11(d)(6))). It is the volume that could be produced in perpetuity on lands that *may be suitable* for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process.

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The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity. The SYL is not a target but is a limitation on harvest, except when the plan allows for a departure.

Timber harvest. The removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.19).

Timber production. The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR 219.19).

Two-aged system. A planned sequence of treatments designed to regenerate or maintain a timber stand with two age classes. A two-aged system is a form of even-aged management.

Uneven-aged stand. A stand of trees of three or more distinct age classes, either intimately mixed or in groups.

Uneven-aged system. A planned sequence of treatments designed to regenerate or maintain a timber stand with three or more age classes. Treatments include single-tree selection, and group selection regeneration methods.

Utilization standards. Utilization standards are specifications for merchantable forest products offered in a timber sale.

61 – Identification of Lands as not Suitable and Suitable for Timber Production

When developing or revising a land management plan the Responsible Official shall review lands within the plan area to identify their suitability for timber production. For a plan amendment, the Responsible Official may conduct a review of lands suitable for timber production if relevant to the issues of the amendment. The Interdisciplinary Team shall summarize the results of this review in the plan or an appendix to the plan (sec. 61, ex. 01 of this Handbook).

Section 219.11 (a)(1) of the Planning Rule lists six factors to be used to identify lands in the plan area as not suited for timber production. The following excerpt from section 219.11(a)(1) of the Planning Rule presents each of these six factors, and next to each is a cross-reference to the section of this chapter containing more detail on the factor.

219.11 Timber requirements based on the NFMA.

(a) Lands not suited for timber production. (1) The responsible official shall identify lands within the plan area as not suited for timber production if any one of the following factors applies:

(i) Statute, Executive order, or regulation prohibits timber production on the land; (sec. 61.11 of this Handbook).

(ii) The Secretary of Agriculture or the Chief of the Forest Service has withdrawn the land from timber production; (sec. 61.11 of this Handbook).

(iii) Timber production would not be compatible with the achievement of desired conditions and objectives established by the plan for those lands; (sec. 61.2 of this Handbook).

(iv) The technology is not currently available for conducting timber harvest without causing irreversible damage to soil, slope, or other watershed conditions; (sec. 61.12 of this Handbook).

(v) There is no reasonable assurance that such lands can be adequately restocked within 5 years after final regeneration harvest; or (sec. 61.13 of this Handbook).

(vi) The land is not forest land (sec. 61.14 of this Handbook).

To identify lands not suited for timber production, use the following two step approach:

1. Identify lands that are not suited based on legal and technical factors at 36 CFR 219.11 (a) (i), (ii), (iv), (v,) and (vi), further described in sections 61.11 to 61.14 of this Handbook. If any of these factors apply to the land, the land is not suited for timber production. These lands do not vary by alternative in the plan EIS and may be identified during the assessment or prior to the development of alternatives.

After subtracting the lands that are not suited from the total of National Forest System lands, the remaining lands are lands that *may be* suited for timber production, and are considered in step 2.

2. From the lands that *may be* suited for timber production (the remaining lands from step 1), identify lands that *are* suited for timber production, based on the compatibility of timber production with the desired conditions and objectives for those lands (sec. 61.2 of this Handbook). This second step process is done in the EIS for each alternative considered in plan development or plan revision, as the desired conditions, objectives, management areas and other plan components will vary among alternatives.

Also in each alternative after subtracting the lands that are suited for timber production (from step 2) from the lands that *may be* suited for timber production (from step 1); the

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remaining lands are not suited for timber production because timber production is not compatible with the land area's desired conditions and objectives (36 CFR 219.11(a)(1)(iii)).

The plan must identify the lands that are suited and not suited for timber production using the table shown in exhibit 01. Exhibit 01 should be used in the plan to display the lands that, following step 1, *may* be suited for timber production, and the lands that, following step 2, have been determined to be suited and not suited for timber production.

Details such as the criteria and methods used, and lands identified for each category, should be kept in the planning record and summarized in an appendix to the plan EIS or appropriate environmental document. Information developed in the planning process on lands suited and not suited for timber production should be developed with sufficient breakdowns and detail in the planning record to be compatible with the national land suitability classification system for timber production (see FSM 2490 – Timber Management Information System). Exhibit 01 should be used in the plan to display the suitability of lands for timber production.

61 - Exhibit 01

Timber Production Suitability Classification

Land Classification Category	Acres
A. Total National Forest System lands in the plan area	1,000,000
B. Lands not suited for timber production due to legal or technical reasons	350,000
C. Lands that may be suited for timber production (A–B)	650,000
D. Total lands suited for timber production because timber production is compatible with the desired conditions and objectives established by the plan	400,000
E. Lands not suited for timber production because timber production is not compatible with the desired conditions and objectives established by the plan (C – D)	250,000
F. Total lands not suited for timber production (B+E)	600,000

61.1 – Lands Not Suitable for Timber Production Based on Legal and Technical Factors (Step 1)

Sections 61.11 – 61.14 of this Handbook provide guidance on how to apply the step 1 factors in the process of determining lands not suitable for timber production based on legal and technical factors (36 CFR 219.11(a)(i), (ii), (iv), (v) and (vi)).

61.11 – Lands on which Timber Production is Prohibited or Lands Withdrawn from Timber Production

Timber production may be prohibited on certain lands by statute, Executive order, regulation, or where the Secretary of Agriculture or the Chief of the Forest Service has withdrawn the land from timber production (36 CFR 219.11(a)(1)(i) and (ii), and FSM 1921.12). Examples include units of the National Wilderness Preservation System, designated wild river segments, research natural areas, and other designated areas (see 36 CFR 219.19 and FSH 1909.12, ch. 20) where timber production is specifically prohibited. Identify these lands as lands not suited for timber production.

61.12 – Lands on which Technology to Harvest Timber is Not Currently Available without Causing Irreversible Damage

The Responsible Official should develop criteria to identify lands within the plan area that are not suited for timber production, because technology to harvest timber without causing irreversible damage is not currently available. The criteria for identifying such lands should take into account information such as landforms, soil conditions, vegetation, and available technology for timber harvest in the plan area.

Apply the criteria to determine where it is not possible to carry out timber harvest activities without irreversible resource damage to soil, slope, or other watershed conditions in the plan area. Relevant information such as soil maps, geological maps, landslide maps, and remote sensing products, as well as information from the terrestrial ecological unit inventory or the soil resource inventory (FSM 2550), may be used to assess soil vulnerability to physical, chemical, and biological damage.

Identify these lands as not suited for timber production.

61.13 – Lands on Which There is No Reasonable Assurance that Lands Can be Adequately Restocked within 5 Years of Final Regeneration Harvest

The Responsible Official should identify criteria for what constitutes adequate restocking after final regeneration harvests for purposes of timber production (see the definition of stocking for possible indices to describe stocking). Such criteria could vary for the different forest types and management systems in the plan area. Specific land types, soil types, and vegetative conditions should be evaluated for appropriate management systems to assess if reasonable assurance

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(see definition) exists that the lands can be regenerated to achieve adequate restocking 5 years after the final regeneration harvest of the appropriate management system.

Relevant information such as most recent soil maps, geological maps, terrestrial ecological unit inventory, monitoring results, and other best available scientific information may be used to identify lands within the planning area where there is no reasonable assurance that the land can be adequately restocked within 5 years after final regeneration harvest. Lands that do not have this reasonable assurance are not suited for timber production.

This is a technical determination that is not based on desired conditions and other plan components, but solely on the ability of the land to sustain timber production. This criteria is to be applied solely to determine suitability for timber production and is not to be confused with the criteria described in section 64.14 of this Handbook regarding assurance of restocking after harvest. Exhibit 01 shows an example of such criteria.

61.13 - Exhibit 01

Adequate Restocking Criteria for Timber Production in Northern Arizona

Trees per acre 5 years after final regeneration harvest

Management System/Final Regeneration Harvest	Forest Type	Adequately Restocked
Even aged/ Final shelterwood removal	Ponderosa Pine	>75 seedlings per acre
Even aged/ Final shelterwood removal	Mixed Conifer	>100 seedlings per acre
Uneven aged/ last group selection entry	Ponderosa Pine	>10 trees above 10 in. d.b.h. ≥50 seedlings
Uneven aged/ last group selection entry	Mixed Conifer	>15 trees above 10 in. d.b.h. ≥75 seedlings

Lands that do not have a reasonable assurance of achieving such adequate restocking within 5 years of final regeneration harvest are identified as not suitable for timber production.

61.14 – Land that Is Not Forest Land (Nonforest)

Nonforest lands are lands that do not meet the definition of forest lands contained in 36 CFR 219.19. Thus, nonforest lands are less than 10 percent occupied by forest trees of any size or that formerly had such tree cover and are currently developed for nonforest uses. Land developed for nonforest uses includes areas for agricultural crops, improved pasture, residential or administrative areas, improved roads of any width and adjoining road clearing, and powerline clearing of any width. Lands that were formerly occupied by tree cover, but do not presently have tree cover, should be identified as nonforest unless the land will be naturally or artificially regenerated into forest cover in the near future (example: clearcut lands).

Canopy cover of live forest trees at maturity occupying an area may be used to estimate if an area is at least 10 percent occupied by forest trees (FSM 1905).

For mapping purposes or calculating land area, unimproved roads, trails, intermittent or small perennial streams, and clearings in forest areas may be included as forestland if they are less than 120 feet in width. Calculations of forestland for determining timber volumes (sec. 64 of this Handbook) should adjust for the cumulative amount of such small inclusions of nonforest lands. Identify nonforest lands as not suitable for timber production.

61.2 – Lands Suited and Not Suited for Timber Production Based on Compatibility with Desired Conditions and Objectives (Step 2)

The second step is to determine for each alternative in the plan EIS which of the lands that *may* be suitable for timber production (identified in step 1) are suited for timber production based on compatibility with desired conditions and objectives. In making this determination, the Responsible Official should consider the following to determine if timber production is compatible with the desired conditions and objectives of the plan:

1. Timber production is a desired primary or secondary use of the land.
2. Timber production is anticipated to continue after desired conditions have been achieved.
3. A flow of timber can be planned and scheduled on a reasonably predictable basis.
4. Regeneration of the stand is intended.
5. Timber production is compatible with the desired conditions or objectives for the land designed to fulfill the requirements of 36 CFR 219.8 to 219.10.

Note that areas recommended for wilderness, wilderness study areas (see FSH 1909.12 ch. 20 sec. 24.41) and eligible or suitable wild river segments (see FSH 1909.12 ch. 20 sec 24.42 are not suitable for timber production to maintain the option for future designation.

The remaining lands after subtracting the lands that are suited from the lands that *may* be suited; are not suited for timber production, because timber production is not compatible with the land area's desired conditions and objectives (36 CFR 219.11(a)(1)(iii)). This is done in the EIS for each alternative considered in plan development or plan revision.

61.3 – Review of Lands Not Suited for Timber Production

The responsible official shall review lands identified in the plan as not suited for timber production at least once every 10 years or as otherwise prescribed by law, to determine whether conditions have changed so that they have become suitable for timber production. As a result of this 10-year review, the plan may be amended to identify such lands as suitable for timber production if warranted by changed conditions. (36 CFR 219.11(a)(2)).

The Responsible Official should determine when and how to conduct this review. If the results of the review would lead to a change in the amount or location of lands suitable for timber production, the Responsible Official will determine the appropriate mechanism to change the plan.

62 – Plan Components for Lands Suitable for Timber Production

A plan that identifies lands as suitable for timber production must include plan components, including standards or guidelines, to guide timber harvest for timber production or other multiple use purposes on such lands. (36 CFR 219.11(b)).

Plan components to meet the requirements of 36 CFR 219.8 -219.10 or to respond to public and governmental interest in the planning process directly or indirectly guide timber harvest on lands suitable for timber production. Plan components, including standards or guidelines that guide timber harvest activity, must at a minimum include the statutory and regulatory limitations on timber harvest as described in section 64 of this Handbook (16 USC 1604(g)(3)(E) and (F), 16 USC 1604(m), and 16 USC 1611; 36 CFR 219.11(d)).

On lands suitable for timber production, plan components may be designed to apply to all purposes for timber harvest, including harvest for timber production or harvest to protect multiple use values; or, plan components may be designed to apply separately as appropriate to each purpose. Plan components that apply to harvest to protect multiple use values may apply to lands not suitable for timber production as well as lands suitable for timber production, where appropriate (see sec. 63 of this Handbook).

63 – Plan Components for Timber Harvest for Purposes Other than Timber Production

Where timber harvest will be used as a tool for purposes other than timber production in order to protect other multiple use values, plans must provide appropriate plan components that allow and control the application of such timber harvest. Such plan components must identify the lands to which they apply. These lands may be identified by forest types, management or geographic areas, lands suited or not suited for timber production, or other criteria. On lands not suited for timber production, plan components may only allow timber harvest to occur to protect multiple use values other than timber production and for salvage, sanitation, public health, or safety, as provided by the rule at 36 CFR 219.11(c):

(c) Timber harvest for purposes other than timber production. Except as provided in paragraph (d) of this section, the plan may include plan components to allow for timber harvest for purposes other than timber production throughout the plan areas, or portions of the plan areas, as a tool to assist in achieving or maintaining one or more applicable desired conditions or objectives of the plan in order to protect other multiple-use values, and for salvage, sanitation, or public health or safety. Examples of using timber harvest to protect other multiple use values may include improving wildlife or fish habitat, thinning to reduce fire risk, or restoring meadow or savanna ecosystems where trees have invaded. (36 CFR 219.11).

The plan must have appropriate plan components that establish permissible reasons for timber harvest for purposes other than timber production in order to protect other multiple use values on lands not suited for timber production. Desired conditions could describe conditions that are achievable through timber harvest. Objectives, identifying the desired rate of progress in achieving desired conditions, could do so in terms of planned outcomes in the plan period accomplished through timber harvest. Standards and guidelines could clarify what timber harvest methods can be used on certain lands and ensure that these activities are consistent with achieving the desired conditions of the plan and other requirements of the Planning Rule.

64 – Limitations on Timber Harvest

The National Forest Management Act (NFMA) requires the Planning Rule to include guidelines for land management plans to ensure that timber will be harvested from National Forest System lands only where certain limitations are met (16 U.S.C. 1604(g)(3)(E)(i-iv)) and to insure that evenaged cuts are only used on National Forest System lands consistent with other limitations (16 U.S.C. 1604(g)(3)(F)(i-v)). In addition, the NFMA at 16 U.S.C. 1604(m) requires that the Secretary establish standards to insure that prior to harvest, stands must generally have reached the culmination of mean annual increment; and requires at U.S.C. 1611 that the Secretary of Agriculture shall limit the sale of timber from each national forest to a quantity

equal to or less than a quantity that can be removed from such forest annually in perpetuity on a sustained-yield basis.

The Planning Rule at §219.11(d) requires:

Limitations on timber harvest. Whether timber harvest would be for the purposes of timber production or other purposes, plan components including standards and guidelines, must ensure the following:

Paragraphs 1 through 7 within §219.11(d) identifies each limitation that must have appropriate plan components. Each limitation is covered in §219.11(d)(1)-(7) either by direct description in a specific paragraph or through reference to NFMA limitations set out in 219.11(d)(5). Exhibit 01 summarizes each limitation and indicates where in this chapter appropriate guidance is found on how plans can meet the limitation. The table is organized in three sections: limitations applicable to all timber harvest, limitations applicable to only even-aged timber harvest, and the limitation on volume that can be sold. Exhibit 01 also references the sections of U.S. Code that contain the limitations identified in the National Forest Management Act and the sections of the Planning Rule that contain or reference these limitations. Section 64 of this Handbook covers each of these limitations in the order identified in exhibit 01. The applicable text of both the NFMA and the Planning Rule are included in each section. If a National Forest Management Act requirement and a rule requirement overlap, both are described in the same section.

Forest Service Handbook 1909.12 – Land Management Planning Handbook
Chapter 60 - Forest Vegetation Resource Management
Amendment: 1909.12-2015-1
Effective date: January 30, 2015

64 - Exhibit 01

Reference Table for Required Plan Components That Limit Timber Harvest

Chapter 60 Section	Requirement Summary	Title 16, U.S. Code Section	Subsection of 219.11
Requirements for all timber harvest			
64.11	No harvest for purposes of timber production on lands not suited for timber production.	1604 (k)	(d)(1)
64.12	Timber harvest would occur only where soil, slope, or watershed conditions would not be irreversibly damaged.	1604 (g)(3)(E)(i)	(d)(2)
64.13	Timber will be harvested only where protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water.	1604 (g)(3)(E)(iii)	(d)(5)
64.13	Timber harvest would be carried out consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources.		(d)(3)
64.14	Timber harvest will be harvested only where there is assurance that such lands can be adequately restocked within 5 years after harvest.	1604 (g)(3)(E)(ii)	(d)(5)
64.15	Timber will be harvested only where the harvesting system is not selected primarily because it will give the greatest dollar return or unit output of timber.	1604 (g)(3)(E)(iv)	(d)(5)
Requirements for only even-aged timber harvest			
64.21, 64.21a-c	Limits to the maximum size for openings that may be cut in one harvest operation and exceptions.	1604 (g)(3)(F)(iv)	(d)(4)
64.22	Clearcutting will be used only where determined to be the optimum method.	1604 (g)(3)(F)(i)	(d)(5)
64.22	Other cuts to regenerate an even-aged stand of timber will be used only where determined to be appropriate.	1604 (g)(3)(F)(i)	(d)(5)
64.23	Even-aged regeneration cutting will be used only where the interdisciplinary review has been completed.	1604 (g)(3)(F)(ii)	(d)(5)
64.24	Even-aged regeneration cutting will be used where cuts are shaped and blended with the natural terrain.	1604 (g)(3)(F)(iii)	(d)(5)
64.25	Timber harvest would be carried out consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources.	1604 (g)(3)(F)(v)	(d)(3)
64.26	Even-aged stands shall generally have reached culmination of mean annual increment to regeneration harvest and exceptions.	1604 (m)	(d)(7)
Limitation on volume that can be sold			
64.3, 64.31-34	The sale of timber from each national forest shall be limited to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis and exceptions (departures, decade, salvage and sanitation harvests).	1611 (a) and (b)	(d)(6)

Sections 64.1 to 64.3 of this Handbook describe the guidance for the limitations required by 36 CFR 219.11(d)(1) through (d)(7). These limitations require plan components, including standards or guidelines. Standards or guidelines are required to provide for each limitation. In addition, other plan components may be used. Most of these sections reflect the expectation that standards will be used as the required plan component to meet the limitation, although Responsible Officials may use guidelines where appropriate. Thus the word “should” is often used consistent with FSH 1909.12, zero code, section 05.1, exhibit 01 to describe the expectation that standards will be used, but to allow Responsible Officials to use guidelines if there are justifiable reasons to do so. See the discussion on integration of plan components in FSH 1909.12, chapter 20, section 23.

In addition to meeting the requirements discussed in this section, the plan may include standards or guidelines that preclude or limit certain harvest methods that are not compatible with the desired conditions for a particular situation or area.

64.1 – Limitations Applicable to All Timber Harvest

No Timber Harvest for the Purpose of Timber Production May Occur on Lands Not Suited for Timber Production

NFMA directs that:

... the Secretary shall assure that except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur on such lands [lands not suited for timber production] for a period of 10 years. (U.S.C. 1604(k)).

The Planning Rule requires plan components, including standards or guidelines, to ensure that:

. . . (1) No timber harvest for the purpose of timber production may occur on lands not suited for timber production. (36 CFR 219.11(d)).

As described in section 64 of this Handbook, plans should have standards that no timber harvest for the purpose of timber production may occur on lands not suited for timber production. This requirement does not preclude plans from having components that allow timber harvest on lands not suited for timber production to protect other multiple-use values, and for salvage, sanitation, public health, or safety (see 36 CFR 219.11(c) and sec. 63 of this Handbook).

64.12 – Timber Harvest May Not Occur if It Leads to Irreversible Damage

NFMA directs that plans:

(E) ensure that timber will be harvested from National Forest System lands only where—

(i) soil, slope, or other watershed conditions will not be irreversibly damaged . . . (16 U.S.C. 1604(g)(3)).

The Planning Rule requires plan components, including standards or guidelines, to ensure that:

. . . (2) Timber harvest would occur only where soil, slope, or other watershed conditions would not be irreversibly damaged; (36 CFR 219.11(d)).

Plans must have standards to ensure that a project decision to harvest timber may only be made when it is determined the project would not cause irreversible damage to soil, slope, or watershed condition. The standards should require a site-specific finding that the timber harvest would not cause irreversible damage. A standard stating no timber harvest could occur on lands where technology to harvest timber is not currently available without causing irreversible damage (see sec. 61.12 of this Handbook) would remove lands with a risk of irreversible damage from potential harvest. For all other lands, Responsible Officials would have to consider additional, site-specific factors associated with any potential harvest to ensure meeting this limitation.

64.13 – Timber Harvest Must Be Consistent with Other Resource Protection

NFMA directs that plans:

(E) insure that timber will be harvested from National Forest System lands only where—

(iii) protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat; . . . (16 U.S.C. 1604(g)(3)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation at § 219.11(d)(5) and to also ensure that:

. . . (3) Timber harvest would be carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources. (36 CFR 219.11(d)).

Plans must have plan components including standards and guidelines to address other aspects of the Planning Rule designed for the protection of streams and other water bodies, soil, watershed, fish, wildlife, recreation, and aesthetic resources. Such plan components may be sufficient to insure these resources are protected from timber harvest. The Responsible Official should review the plan components to determine if a timber harvest consistent with those plan

components would also provide for appropriate protection of these resources. If not, additional plan components must be developed to ensure that all harvests meet this limitation.

64.14 – Assurance of Adequate Restocking within 5 Years after Harvest

NFMA directs that plans:

(E) insure that timber will be harvested from National Forest System lands only where . . .

(ii) there is assurance that such lands can be adequately restocked within five years after harvest . . . (16 U.S.C. 1604(g)(3)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation at §219.11(d)(5).

As described in section 64 of this Handbook, plans should have standards that limit timber harvest to situations that have reasonable assurance (see definition) that the stand can be adequately restocked within 5 years after harvest. Such standards should be based on the different types of forests within the plan area, the harvest methods applied and the desired conditions and objectives of the plan. These standards can be organized either by having the plan determine what is adequate restocking in different harvest circumstances, or the plan can require that a determination of what is adequate restocking can be made at the project level. The Responsible Official may choose to use one of these two basic approaches or a third approach that combines the first two approaches.

1. In the first approach, the plan contains standards that limit timber harvest to situations with reasonable assurance (see definition) that the stand can be adequately restocked within 5 years of harvest. The standard also identifies what would constitute adequate restocking for specific harvest situations. The desired conditions of the plan may also identify “desired stocking conditions” for these same specific harvest situations.

This approach is displayed in an example in exhibit 01.

Plan documentation should support the determination that there is reasonable assurance (see definition) that the identified lands and harvest methods can be adequately restocked for the situations described. The determination of reasonable assurance should be based on best available scientific information.

Timber harvest projects for these specific harvest situations can use the documentation for the plan to demonstrate reasonable assurance of adequate restocking. This approach should also require a finding that the land proposed for harvest can be adequately restocked based on the documentation for the land management plan.

64.14 - Exhibit 01

Example Table Showing Desired and Adequate Stocking Conditions

Stocking objectives (trees per acre) for ponderosa pine stands in Northern Arizona
5 years after harvest

Harvest method	Desired Stocking	Adequately Restocked
Shelterwood regeneration with overstory retention	5-10 trees above 10 in. d.b.h. 75-125 seedlings	>5 trees above 10 in. d.b.h. ≥75 seedlings
Intermediate thinning	10-20 trees above 10 in. d.b.h. 10-20 trees above 5 in. d.b.h. 25-60 seedlings	>10 trees above 10 in. d.b.h. >10 trees above 5 in. d.b.h. ≥25 seedlings
Salvage harvest following fire destroying canopy	5-10 trees above 10 in. d.b.h. 50-100 seedlings	>5 trees above 10 in. d.b.h. (if available) ≥50 seedlings
Harvest to create permanent meadow **	<10 trees of any size	No trees

** Any timber harvest that would not restock after harvest to create nonforest conditions must be based on desired conditions or objectives of the plan and be consistent with other plan components. After harvest, affected land should be classified as not suitable for timber production (sec. 61.13 of this Handbook) as it would no longer be forest land. This change can be made as part of the review of lands not suited for timber production (sec. 61.3 of this Handbook).

2. In the second approach, the plan also contains standards that limit timber harvest to situations with reasonable assurance (see definition) that the stand can be adequately restocked within 5 years of harvest. However, these standards require individual timber harvest projects to state findings *and* provide site-specific documentation that supports the reasonable assurance determination that lands can be adequately restocked within 5 years. The determination of restocking expectations is based on plan desired conditions and objectives applicable to the area and project, and consistent with all other applicable plan components.

This second approach may be appropriate where restocking criteria would vary across most of the plan area. It is also an option for the following types of timber harvests where removal of forest cover may be consistent with the desired conditions and objectives of the plan such as:

- a. Harvest to restore habitat for a species requiring very open conditions.
- b. Harvest to restore a previously impacted site, such as a timber plantation.

- c. Harvest to eradicate an invasive tree that has dominated the site.
 - d. Harvest to restore an open cultural landscape associated with a historic property.
 - e. Harvest to create a parking lot for a trailhead.
3. In a third, mixed approach, the plan contains standards that limit timber harvest to situations that have reasonable assurance (see definition) that the stand can be adequately restocked within 5 years of harvest. These standards also identify what would constitute adequate restocking as in the first approach. However, the standards explicitly allow for other situations or exceptions supported by a project-specific determination of adequate restocking. The Responsible Official in determining a finding of adequate restocking can rely on documentation in the plan record for the situations described in the plan, but must provide project-specific documentation for situations not included in the plan. This finding must be based on desired conditions and objectives and be consistent with all other applicable plan components.

64.15 - Selection of Harvesting System

NFMA directs that plans:

(E) insure that timber will be harvested from National Forest System lands only where . . .

(iv) the harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber . . . (16 U.S.C. 1604(g)(3)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation at §219.11(d)(5) .

As described in section 64 of this Handbook, plans should include a standard indicating that the harvesting system for a project must not be selected primarily for the greatest dollar return or output of timber.

64.2 – Limitations for Even-aged Harvest

The National Forest Management Act establishes limitations applicable to harvests designed to regenerate an even-aged stand of timber (16 U.S.C. 1604(g)(3)(F)):

(F) insure that clearcutting, seedtree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber will be used as a cutting method on National Forest System lands only where— (limitations follow in 16 U.S.C. 1604(g)(3)(F)(i-v)).

The balance of this section (sec. 64.21–64.26 of this Handbook) describes how plans should provide plan components for each of these five limitations.

64.21 – Limits on Maximum Size of Created Openings

The National Forest Management Act limits clearcutting and other even-aged harvest to situations where:

(iv) there are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal: Provided, That such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm . . . (16 U.S.C. 1604(g)(3)(F)).

The regulation establishes maximum sized openings for types of tree species in specific geographic areas, and establishes a maximum size opening for all other tree species regardless of location. To meet this limitation, plans must have standards that establish size openings no larger than that allowed by the regulation except as described in the Planning Rule at §219.11(d)(4)(i)-(iii) and explained in sections 64.21a through 64.21c of this Handbook.

. . . (4) Where plan components will allow clearcutting, seedtree cutting, shelterwood cutting or other cuts designed to regenerate an even-aged stand of timber, the plan must include standards limiting the maximum size for openings that may be cut in one harvest operation according to geographic areas, forest types or other suitable classifications. Except as provided in paragraphs (d)(4)(i) through (iii) of this section, this limit may not exceed 60 acres for the Douglas-fir forest type of California, Oregon, and Washington; 80 acres for the southern yellow pine types of Alabama, Arkansas, Georgia, Florida, Louisiana, Mississippi, North Carolina, South Carolina, Oklahoma, and Texas; 100 acres for the hemlock-Sitka spruce forest type of coastal Alaska; and 40 acres for all other forest types. (36 CFR 219.11(d)(4)).

64.21a – Standards for Exceptions to Exceed Opening Size Limits

(i) Plan standards may allow for openings larger than those specified in paragraph (d)(4) of this section to be cut in one harvest operation where the Responsible Official determines that larger harvest openings are necessary to help achieve desired ecological conditions in the plan

area. If so, standards for exceptions shall include the particular conditions under which the larger size is permitted and must set a maximum size permitted under those conditions. (36 CFR 219.11(d)(4)(i)).

The Planning Rule also provides that plans may specifically allow for larger openings than those established in the planning regulation. If a plan makes such exceptions, the standard limiting the size of created openings must clearly describe the particular conditions for the exception including the desired ecological conditions that the exception intends to achieve. Such an exception should be described in the standards that limit the size of openings described in section 64.21 of this Handbook

64.21b – Notification and Review to Exceed Opening Size Limits on an Individual Timber Sale Basis

(ii) Plan components may allow for size limits exceeding those established in paragraphs (d)(4) and (d)(4)(i) of this section on an individual timber sale basis after 60 days public notice and review by the regional forester. (36 CFR 219.11(d)(4)).

The standards for opening size limits in section 64.21 of this Handbook and the exceptions identified in section 64.21a of this Handbook may also provide exceptions that would allow Responsible Officials to propose individual timber sales that exceed these opening size standards, where doing so would be consistent with other plan components. Such an exception must also provide that such a project may be authorized only after the Responsible Official provides 60 days' notice to the public and review by the Regional Forester.

64.21c – Catastrophic Conditions that Allow Exceeding Opening Size Limits

Plan standards that limit the size of created openings (sec. 64.21 of this Handbook) in one harvest operation do not apply to openings made by harvesting as a result of the catastrophic conditions such as fire, insect and disease attack, or windstorm (36 CFR 219.11(d)(4)).

(iii) The plan maximum size for openings to be cut in one harvest operation shall not apply to the size of openings harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm (16 U.S.C. 1604(g)(3)(F)(iv)). (36 CFR 219.11(d)(4)).

Projects that exceed opening sizes because of natural catastrophic conditions must still be consistent with other plan components.

64.22 – Clearcutting and Other Even-aged Cutting Methods

The National Forest Management Act limits clearcutting and other even-aged harvest to situations where:

(i) for clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan . . . (16 U.S.C. 1604(g)(3)(F)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation at §219.11(d)(5).

1. To meet the requirement that plan components may provide for clearcutting only when it is the optimum method, one of the following approaches may be used:
 - a. The plan has standards that limit clearcutting to specific types of situations identified in the plan where clearcutting is the optimum method of harvest. The determination of optimality is based on the desired conditions or objectives for the plan area or relevant portion(s) thereof. The planning record must provide documentation to support this determination of clearcutting as the optimum method. The plan standards should also require a finding at the project level that clearcutting is the optimal method based on the documentation for the land management plan.
 - b. The plan has a standard requiring, for each clearcutting project, that the Responsible Official make a finding that clearcutting is the optimum method for the project and document the rationale for that finding in the project record. The finding and documentation that clearcutting is the optimum method for the project must be based on site specific conditions and the desired conditions or objectives of the plan applicable to area proposed for clearcutting.
 - c. The plan has a standard that combines approaches (a) and (b), limiting clearcutting to specific types of situations identified in the plan, but also allowing clearcutting in additional instances, upon a site-specific finding that clearcutting is the optimum method. The Responsible Official in determining a finding of optimality can rely on documentation in the plan record for the situations described in the plan, but must provide project specific documentation for situations not included in the plan.

2. To meet the requirement that plan components may provide for shelterwood, seedtree, and other types of even-aged cuts only where they are appropriate, one of the following approaches can be used:

- a. The plan has a standard limiting certain types of even-aged harvests to the types of situations where the plan identifies such harvests are appropriate based on the desired conditions or objectives for the plan area or relevant portion(s) thereof. The plan may identify the specific even-age harvest method(s) appropriate to each type of situation, or may find that all even-age harvest methods (other than clearcutting) are appropriate. The planning record must provide documentation to support this determination that even-aged cuts are appropriate. The standard should also require a finding at the project level that the even-aged harvest is appropriate based on the documentation for the land management plan.
- b. The plan has a standard requiring, for each even-aged harvest project, that the Responsible Official make a finding that such harvest is appropriate for the project, and document the rationale for that finding in the project record. The finding that the even-aged cuts for the project is appropriate must be based on site-specific conditions and the desired conditions or objectives of the plan applicable to area proposed for even-aged harvest.
- c. The plan has a standard that combines approaches (a) and (b), limiting other types of even-aged cuts to specific types of situations identified in the plan, but also allowing for even-aged harvests in additional instances, upon a finding that the even-aged cut is appropriate. The Responsible Official in determining a finding of appropriateness can rely on documentation in the plan record for the situations described in the plan, but must provide project-specific documentation for situations not included in the plan.

64.23 – Interdisciplinary Review

The National Forest Management Act limits clearcutting and other even-aged harvest to situations where:

(ii) the interdisciplinary review as determined by the Secretary has been completed and the potential environmental, biological, esthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area . . . (16 U.S.C. 1604(g)(3)(F)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation at §219.11(d)(5).

As described in section 64 of this Handbook, plans should have standards requiring interdisciplinary review, assessments of the project's impacts through appropriate environmental documentation and a finding that the project is consistent with the multiple uses of the general area for any even-aged regeneration harvests.

64.24 – Cuts Shaped and Blended with Natural Terrain

The National Forest Management Act limits clearcutting and other even-aged harvest to situations where:

(iii) cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain . . . (16 U.S.C. 1604(g)(3)(F)).

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation in §219.11(d)(5).

Plan components related to scenic character usually provide for blending harvest units into the natural terrain (see FSH 1909.12, ch. 20, sec. 23.23(f)) and will likely suffice to ensure compliance with this timber harvest requirement. The Responsible Official should review plan components developed to provide for scenery to see if consistency with those plan components ensures that this requirement is also met. If not, additional plan components must be developed to ensure meeting this requirement.

64.25 – Consistency with Resource Protections

The National Forest Management Act limits clearcutting and other even-aged harvest to situations where:

(v) such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource. (16 U.S.C. 1604(g)(3)(F)).

The Planning Rule requires plan components, including standards or guidelines, to meet these limitations at §219.11(d)(5). In addition, at 219.11 (d)(3), the rule applies these limitations (except the regeneration of timber) to all timber harvests.

Section 64.13 of this Handbook describes how plan components should be provided to meet the resource protections described in this section. Section 64.14 of this Handbook describes how plan components can be provided to provide for the regeneration of the timber resource.

64.26 – Culmination of Mean Annual Increment of Growth

The National Forest Management Act sets out a requirement to ensure that timber harvest must occur at the culmination of the mean annual increment of growth, but also provides for exceptions at 16 USC 1604(m):

(m) Establishment of standards to ensure culmination of mean annual increment of growth; silvicultural practices; salvage harvesting; exceptions.

The Secretary shall establish —

(1) standards to insure that, prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth (calculated on the basis of cubic measurement or other methods of calculation at the discretion of the Secretary): *Provided*, That these standards shall not preclude the use of sound silvicultural practices, such as thinning or other stand improvement measures: *Provided further*, That these standards shall not preclude the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow or other catastrophe, or which are in imminent danger from insect or disease attack; and

(2) exceptions to these standards for the harvest of particular species of trees in management units after consideration has been given to the multiple uses of the forest including, but not limited to, recreation, wildlife habitat, and range and after completion of public participation processes utilizing the procedures of subsection (d) of this section.

The Planning Rule requires plan components, including standards or guidelines, to meet this limitation as described at §219.11 (d)(7).

(7) The regeneration harvest of even-aged stands of trees is limited to stands that generally have reached the culmination of mean annual increment (CMAI) of growth. This requirement would apply only to regeneration harvest of even-aged stands on lands identified as suited for timber production and where timber production is the primary purpose for the harvest. Plan components may allow for exceptions, set out in 16 U.S.C 1604(m), only if such harvest is consistent with the other plan components of the land management plan.

Plans for national forests that have lands suitable for timber production must include plan components (typically standards and guidelines) to address these requirements.

A stand that “generally [has] reached the culmination of mean annual increment (CMAI) of growth” is the age at which the stand achieves at least 95 percent of the cubic foot volume at culmination.

1. When determining the culmination of the mean annual increment of growth, the Responsible Official shall:
 - a. Calculate the culmination of the mean annual increment of growth in terms of cubic feet .
 - b. Base the determination of the culmination of mean annual increment of growth on the expected cumulative timber yield from regeneration harvest and additional timber yields from any planned intermediate harvests prior to the regeneration harvest. The minimum rotation age is the shortest length of time required to achieve volume production equivalent to at least 95 percent of the culmination of mean annual increment. To determine culmination of mean annual increment for two-age stands, the calculation should be based only on the age cohort that would be scheduled for regeneration harvest. See also the definition of “Mean annual increment” in section 60.5 of this Handbook.
2. Plan components that limit regeneration harvest to stands that have reached 95 percent of culmination of mean annual increment must clarify that these limitations do not apply to:
 - a. Thinning or other stand improvement treatments and uneven-aged systems that do not regenerate even-aged stands.
 - b. Salvage or sanitation harvesting of timber stands which are substantially damaged by fire, wind throw, or other catastrophe, or which are in imminent danger from insect or disease attack.
 - c. Harvesting of trees on lands not suited for timber production because the type and frequency of harvests are driven by the need to protect multiple use values other than timber production.
3. A plan may provide for exceptions to the culmination of mean annual increment requirement for expected situations where even-aged regeneration harvest at less than culmination of mean annual increment would contribute to the plan’s desired conditions or objectives consistent with other plan components. For example, it may be appropriate for a plan to establish shorter even-aged rotations to maintain levels of early seral stages sufficient for wildlife that depend upon such habitat conditions.

64.3 – Limiting the Quantity of Timber that Can Be Removed

The National Forest Management Act requires the Forest Service limit the amount of timber that may be sold from each national forest (16 U.S.C. 1611).

(a) Limitations on removal; variations in allowable sale quantity; public participation.

The Secretary of Agriculture shall limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis: Provided, That, in order to meet overall multiple-use objectives, the Secretary may establish an allowable sale quantity for any decade which departs from the projected long-term average sale quantity that would otherwise be established: Provided further, That any such planned departure must be consistent with the multiple-use management objectives of the land management plan. Plans for variations in the allowable sale quantity must be made with public participation as required by section 1604(d) of this title. In addition, within any decade, the Secretary may sell a quantity in excess of the annual allowable sale quantity established pursuant to this section in the case of any national forest so long as the average sale quantities of timber from such national forest over the decade covered by the plan do not exceed such quantity limitation. In those cases where a forest has less than two hundred thousand acres of commercial forest land, the Secretary may use two or more forests for purposes of determining the sustained yield.

(b) Salvage harvesting.

Nothing in subsection (a) of this section shall prohibit the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow, or other catastrophe, or which are in imminent danger from insect or disease attack. The Secretary may either substitute such timber for timber that would otherwise be sold under the plan or, if not feasible, sell such timber over and above the plan volume.

The Forest Service planning regulations at 36 CFR 219.11 (d) requires implementation of the statute as follows:

(d) Whether timber harvest would be for the purposes of timber production or other purposes, plan components, including standards or guidelines must ensure the following:

(6) The quantity of timber that may be sold from the national forest is limited to an amount equal to or less than that which can be removed from such forest annually in perpetuity on a sustained yield basis. This limit may be measured on a decadal basis.

(i) The plan may provide for departures from this limit as provided by the NFMA when departure would be consistent with the plan's desired conditions and objectives. Exceptions for departure from this limit on the quantity sold may be made only after a public review and comment period of at least 90 days.

(ii) This limit may be based upon increases in harvest levels based on intensified management practices, such as reforestation, thinning, and tree improvement if such practices justify increasing the harvests in accordance with the Multiple-Use Sustained-Yield Act of 1960. The plan must require that such harvest levels be decreased at the end of each planning period if such practices cannot be successfully implemented or funds are not received to permit such practices to continue substantially as planned.

(iii) The Chief must include in the Forest Service Directive System procedures for estimating the quantity of timber that can be removed annually in perpetuity on a sustained-yield basis, and exceptions, consistent with 16 U.S.C. 1611.

The plan for a national forest that intends to sell timber must identify the sustained yield limit (SYL). The sustained yield limit is the amount of timber that can be removed annually on a sustained yield basis. To meet the requirements that the volume sold cannot exceed the sustained yield limit, the plan must have either:

1. A standard that limits the quantity of timber that may be sold in a decade to less than or equal to 10 times the forest's annual sustained yield limit (see sec. 64.31 of this Handbook); or
2. A standard that limits the quantity of timber that may be sold in a decade to be less than or equal to 10 times the forest's departure limit. (See sec. 64.33 of this Handbook).

The sustained yield limit and the departure limit are calculated and displayed as an annual volume. However, in any given year, the Responsible Official may sell a quantity of timber in excess of the annual volume of the sustained yield limit or departure limit as long as the total quantity sold over a 10-year period does not exceed the applicable limit for the decade (U.S.C 1611(a)).

Neither the sustained yield limit nor the departure limit applies to the sale of volume from salvage or sanitation harvesting of timber stands substantially damaged by fire, windthrow, or other catastrophe, or that are in imminent danger from insect or disease attack (U.S.C 1611(b)).

Sections 64.31 and 64.32 of this Handbook describe how to identify the sustained yield limit, the projected wood sale quantity, the projected timber sale quantity and the amount of timber actually sold to ensure compliance with this standard. Each of these timber volumes must be measured in cubic feet. Section 64.35, exhibit 01 of this Handbook displays the different characteristics of these measures of timber volumes.

64.31 – Sustained Yield Limit

The Responsible Official shall identify the amount of timber that can be removed annually in perpetuity on a sustained-yield basis from the applicable national forest. This amount of timber is the forest's sustained yield limit (SYL). The sustained yield limit must be identified at the time of plan development and plan revision, and displayed as shown in section 65.2, exhibit 01 or exhibit 02 of this Handbook.

The Responsible Official shall determine of the sustained yield limit as the amount of timber that could be produced on all lands that *may be suitable* for timber production, assuming all of these lands were managed to produce timber without considering other multiple uses or fiscal or organizational capability. Assume the application of a management system (even-aged or uneven-aged) that is generally appropriate for the forest types and identify the potential flow of timber that could be reasonably planned and scheduled for these lands.

When determining the sustained yield limit:

1. Because the land that *may be suitable* for timber production does not vary by alternatives considered in the environmental impact statement for plan development or revision; the sustained yield limit calculation is a single constant for the applicable national forest. Because the sustained yield limit represents the potential of volume that could be harvested in perpetuity, it does not vary by decade or any other time period.
2. Volume from salvage and sanitation timber harvest is not included in calculating the sustained yield limit.
3. The sustained yield limit is measured in units of cubic feet that meet appropriate utilization standards (sec. 64.34 of this Handbook). As appropriate, the potential sustained yield may also be converted to board feet.
4. The analysis to determine the sustained yield limit should be done within reasonable cost and time commitments. The analysis can be based on standard growth and yield

equations that estimate sustainable timber production from the lands that may be suitable for timber production. Calculations of the sustained yield limit should include all potential outputs of timber that would meet utilization standards (sec. 64.34 of this Handbook) for products sold from National Forest System lands. Regression equations and growth and yield simulation models such as Forest Vegetation Simulator (FVS) are acceptable tools for determining the sustained yield limit. Data used to develop sustained yield limit may include volume, basal area, number of trees, and average diameter at breast height (d.b.h.) by age class or successional stage. The Responsible Official shall determine the appropriate method to use for determining the sustained yield limit.

5. The calculation of the sustained yield limit may be based on application of intensified management practices, such as reforestation, thinning, and tree improvement.

64.32 – Projected Wood Sale Quantity, Projected Timber Sale Quantity, and Quantity of Timber Sold

The projected wood sale quantity (PWSQ), is an estimate of the volume of all timber and other wood products that is expected to be sold during the plan period from expected harvests for any purpose (except salvage harvest or sanitation harvest) on all lands in the plan area. The projected wood sale quantity includes all woody material likely to be sold from these harvests whether or not the woody material meets the utilization standards (sec. 64.34 of this Handbook).

The projected timber sale quantity is a subset of the projected wood sale quantity and is an estimate of the quantity of timber expected to be sold during the plan period. The volume in the projected timber sale quantity is the volume that meets utilization standards (sec. 64.34 of this Handbook). Except as provided in section 64.33 of this Handbook (departure from sustained yield limit), the projected timber sale quantity must be equal to or below the sustained yield limit for each decade of the plan.

The estimation of both the projected wood sale quantity and the projected timber sale quantity must take into account the fiscal capability of the planning unit and be consistent with all plan components. Both the projected wood sale quantity and the projected timber sale quantity should vary for each alternative considered in the environmental document. Estimates of the projected wood sale quantity and the projected timber sale quantity do not include any volumes anticipated from salvage or sanitation harvests.

See section 64.35, exhibit 01 of this Handbook for a comparison of the different characteristics between the sustained yield limit, the projected wood sale quantity, and the projected timber sale quantity.

The displays in section 65.2 of this Handbook for timber volumes must show volumes for both the first and second decade. Although the NFMA provides that the plan period is at least every 15 years, it limits the sale of timber to less the sustained yield limit for each *decade* of the plan (16 U.S.C. 1611). Providing estimates in the plan of the annual projected wood sale quantity and the annual projected timber sale quantity for the each of first two decades aligns with the NFMA decadal periods limiting the sale of timber, and provides estimates to cover a second decade if revision of the plan is delayed beyond the 15-year limit.

The display of the projected wood sale quantity and projected timber sale quantity is described in section 65.2 of this Handbook.

After development or revision of the plan, the Responsible Official shall track the quantity of woody material sold from the plan area (comparable to the projected wood sale quantity) and specifically the quantity of timber sold that meets utilization standards (comparable to the projected timber sale quantity) to evaluate compliance with the decadal timber limitation described in section 64.3 of this Handbook.

If intensified management practices were used to calculate the projected timber sale quantity, and such practices did not occur as planned, the projected timber sale quantity must be decreased at the end of the plan period by an amount attributable to the contribution of those intensified practices to the estimation of the projected timber sale quantity.

All data resulting from the guidance in this directive pertinent to timber volumes should be compiled according to the reporting requirements of the official Forest Service applications, the Timber Information Manager (TIM) and the Forest Service Activity Tracking System (FACTS), to report timber resource activities and timber sale accomplishment consistent with this directive (see FSM 2410 – Timber Resource Management Planning).

64.33 – Departure from Sustained Yield Limit

To meet overall multiple-use objectives and achieve the plan's desired conditions and objectives, the Responsible Official may decide to increase the expected sale of timber above the sustained yield limit (SYL) for the first decade of the plan, and for a second decade if necessary. In a departure the sustained yield limit is replaced by a departure limit that represents the maximum amount of timber meeting utilization standards that can be sold for the first or second decade of the plan. The departure limit can be different for each of these two decades. The departure limit is only applicable to a departure alternative considered in the appropriate environmental document. In all other respects, the assumptions for its calculation are the same as for the sustained yield limit.

Departure from the sustained yield limit must be designed for achieving the multiple-use management objectives of the land management plan, as reflected in the plan desired conditions, objectives and other plan components. The rationale for the departure must be

explained in the plan decision document. Departures are expected to be used rarely to achieve desired conditions and objectives that cannot be achieved without the departure.

A departure above the sustained yield limit must be made with public participation after a public review and comment period of at least 90 days (16 USC 1604(d) and 1611(a); 36 CFR 219.11(d)(6)). The 90-day comment period for review of a proposed land management plan or plan revision meets this requirement (36 CFR 219.16(a)(2)).

The departure increment may exceed the sustained yield limit for one or more decades and subsequently lead to the projected timber sale quantity dropping below the sustained yield limit.

The Responsible Official may review the accomplishment and effects of the departure schedule and adjust as appropriate in the adaptive management framework.

64.34 – Utilization Standards

For purposes of the calculations and measurement of timber volumes described in section 64.35 of this Handbook and referenced in section 65.2, exhibits 01 and 02 of this Handbook; the plan must identify or reference the appropriate utilization standards that identify the standard types of timber products expected to be sold. These utilization standards may distinguish between sawtimber, pulpwood, and other products. Utilization standards for timber should not include branches, sawdust, fuelwood, firewood, biomass, or other woody material not consistently sold or measured on a cubic-volume basis. The woody material expected to be sold that does not meet timber utilization standards is not included in the projected timber sale quantity, but must be displayed as part of the projected wood sale quantity (sec. 65.1 of this Handbook). These utilization standards are not plan standards as described in 36 CFR 219.7(e)(1)(iii).

Regions must identify utilization standards in regional supplements to the directives to maintain a basis for consistent calculation and measurement of timber quantities identified in the plan and timber sold within the region. The plan must identify or reference the utilization standards used in developing the determination of the sustained yield limit and the estimation of the projected timber sale quantity.

64.35 – Summary of Measures of Timber Volumes

Exhibit 01 summarizes the characteristics of these different measures of timber volume described throughout section 65.2 of this Handbook.

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64.35 - Exhibit 01

Characteristics of Timber Volume Measures

	Sustained Yield Limit (SYL)	Projected Wood Sale Quantity (PWSQ)	Projected Timber Sale Quantity (PTSQ)
Based on lands that <i>may</i> be suitable for timber production.	Yes	No	No
Based on quantity sold from all lands in plan area.	No	Yes	Yes
Based on the assumption that all lands that may be suitable for timber production are managed for timber production.	Yes	No	No
Limited by plan components, fiscal capability, and organizational capacity.	No	Yes	Yes
All volume meets utilization standards.	Yes	No	Yes
Includes salvage or sanitation harvest volume.	No	No	No
Varies by alternative in Plan EIS. *	No	Yes	Yes

* A departure limit shares the characteristics of the sustained yield limit, except that it is unique for an alternative that uses a departure.

65 – Land Management Plan Guidance

In addition to 36 CFR 219.11, sections 219.7, 219.8, 219.9, and 219.10 have substantive requirements that guide the development of plan components for vegetation. FSH 1919.12, chapter 20, describes the plan development process and provides guidance for the development of plan components and other plan content.

The National Forest Management Act also requires plans to include specific information regarding timber management at 16 USC 1604 (e)(2) and (f)(2), as follows.

(e) Required assurances

In developing, maintaining, and revising plans for units of the National Forest System pursuant to this section, the Secretary shall assure that such plans -

(2) determine forest management systems, harvesting levels, and procedures in the light of all of the uses set forth in subsection (c)(1) of this section, the definition of the terms “multiple use” and “sustained yield” as provided in the Multiple-Use Sustained-Yield Act of 1960, and the availability of lands and their suitability for resource management

(f) Required provisions

Plans developed in accordance with this section shall -

(2) be embodied in appropriate written material, including maps and other descriptive documents, reflecting proposed and possible actions, including the planned timber sale program and the proportion of probable methods of timber harvest within the unit necessary to fulfill the plan;

The Planning Rule requires this information as plan content other than plan components, at 36 CFR 219.7:

(f) Other content in the plan. (1) Other required content in the plan. Every plan must . . .

(iv) Contain information reflecting proposed and possible actions that may occur on the plan area during the life of the plan, including: the planned timber sale program; timber harvesting levels; and the proportion of probable methods of forest vegetation management practices expected to be used (16 U.S.C. 1604(e)(2) and (f)(2)). Such

**information is not a commitment to take any action and is not a
“proposal” as defined by the Council on Environmental Quality
regulations for implementing NEPA.**
(40 CFR 1508.23, 42 U.S.C. 4322(2)(C)).

Section 65.1 and 65.2 of this Handbook describe how to present in the land management plan the planned timber sale program. This includes the probable methods of forest vegetation management practices including timber harvest by the amount of land area planned for treatment; and the planned timber harvest levels in terms of the measures of timber volume discussed in 64.3 of this Handbook.

65.1 – Display of Forest Vegetation Management Practices

To meet the requirement for a display of the planned types of vegetation management practices including the planned timber sale program and the proportion of probable methods of timber harvest, use a table similar to that in exhibit 01. The table may also include other vegetation management practices such as prescribed fire, reforestation, or stand improvement. The table should display the estimated annual acreage of these practices planned for the first and second decades in the plan area, and the description of the table should acknowledge that the plan must be revised at least once every 15 years.

The planned practices are the estimated types of practices planned to achieve the outcomes described by the plan's desired conditions and objectives, consistent with the other plan components during the plan period. The estimated practices must be based on the fiscal capability of the planning unit. The estimated practices are not a commitment to take an action or a proposal for such action.

At a minimum, this identification of management practices must display or describe practices of even-aged and uneven-aged management systems planned for the plan area. The practices identified can be broken out by lands suited or not suited for timber production or any other land stratification deemed appropriate by the Responsible Official.

These estimated vegetation practices may also be plan objectives in the land management plan. The estimated practices usually derive from the analysis of the selected alternative in the environmental impact statement.

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65.1 - Exhibit 01

Estimated Vegetation Management Practices

Forest-wide Vegetation Management Practices (acres) Annual Average per Decade		
Forest Cover Types/ Vegetation Management Practices	Summary	
	1 st Decade	2 nd Decade
Openings Maintenance Even Aged		
Prescribed Fire	0	1,040
Aspen Treatments		
Regeneration* (Even-aged harvest)	1,890	600
Thinning (Intermediate harvest)	960	390
Jack Pine Treatments		
Regeneration* (Even-aged harvest)	1,210	900
Thinning (Intermediate harvest)	230	30
Mid-seral Treatments		
Regeneration* (Even-aged harvest)	250	1,030
Thinning (Intermediate harvest)	3,730	2,510
Late-seral Treatments		
Regeneration* (Even-aged harvest)	1,770	3,560
Thinning (Intermediate harvest)	4,420	2,830
Improvement/Selection (Uneven-aged harvest)	3,820	3,920
Total Treatments		
Regeneration* (Even-aged harvest)	5,110	6,090
Thinning (Uneven-aged harvest)	9,340	5,760
Improvement/Selection (Uneven-aged harvest)	3,820	3,920

* Regeneration harvest treatment includes clearcuts, shelterwoods, shelterwood removal and seedtree methods.

65.2 – Display of Timber Harvest Levels

Display the sustained yield limit, the projected wood sale quantity, and the projected timber sale quantity, in a table with a format similar to that presented in exhibit 01 or exhibit 02. Exhibit 01 displays this information for a normal situation while exhibit 02 shows a similarly formatted table for a departure situation. All volumes in the table should be displayed as annual averages for the decade rather than decadal totals.

The following provides an explanation of the rows in the table at exhibit 02:

The first line shows the **sustained yield limit** in millions of cubic feet per year.

Row A displays the estimated volumes of timber meeting timber product utilization standards expected to be sold from lands suitable for timber production. Line A1 shows the amount of sawtimber volume in cubic feet and board feet for each decade. Line A2 shows the amount of non-sawtimber products expected to be sold that meet utilization standards for sale.

Row B shows the estimated volumes of timber meeting timber product utilization standards expected to be sold from lands not suitable for timber production if the plan anticipates timber harvest on those lands. If the plan anticipates timber harvest for protection of multiple use values on lands not suitable for timber production, separate harvest volume breakdowns should be provided for lands suitable and not suitable for timber production. The **B** lines repeat the same format and sequence as the **A** lines.

Row C sums these quantities from rows A1, A2, B1 and B2, to indicate the **projected timber sale quantity** for the plan area for the first two decades in both cubic and board foot measurements. The cubic foot total must be less than the sustained yield limit for each decade.

Row D shows any estimates of woody material not meeting utilization standards, such as fuelwood, firewood, or woody biomass, that are expected to be sold in the first two decades. If it is useful to do so, this row could show different types of wood products anticipated; only fuelwood is shown in the exhibit. Volumes should be displayed in both cubic feet and tons.

Finally, row **E** provides the **projected wood sale quantity** that includes all wood products and materials expected to be sold. This quantity must be displayed in cubic feet, but may also be converted into other units of measure.

For a departure schedule, the format in exhibit 02 should be used. This table has the same format as the table in exhibit 01, except that the departure increment and the departure limit are added to the table. Exhibit 02 shows a departure only for the first decade for restoration activity on lands that are not suitable for timber production. In a departure decade, the projected timber sale quantity must be less than or equal to the departure limit. In the second

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decade, there is no departure and the projected timber sale quantity must be less than or equal to the sustained yield limit.

These estimated outputs may be displayed in the plan in this or any supplemental table by softwoods and hardwoods, for different product types, species or any other desired breakdown.

65.2 - Exhibit 01

Planned Timber Sale Program

Annual Average Volume Outputs for 1st and 2nd Decade

Sustained Yield Limit (SYL)	50.0 MMCF			
	First Decade		Second Decade	
	MMCF	MMBF	MMCF	MMBF
Timber Products	Volumes other than salvage or sanitation volumes that meet timber product utilization standards			
Lands suitable for timber production				
A1. Sawtimber	18.0	90.0	18.0	90.0
A2. Other products	1.7		1.7	
Lands not suitable for timber production				
B1. Sawtimber	7.0	35.0	5.0	25.0
B2. Other products	1.3		1.3	
C. Projected Timber Sale Quantity (PTSQ) (A1+A2+B1+B2)	28.0	125.0	26.0	115.0
Other Estimated Wood Products	Fuelwood, biomass, and other volumes that do not meet timber product utilization standards			
	MMCF	Tons	MMCF	Tons
D. Fuelwood	3.0	45.0	2.5	37.5
E. Projected Wood Sale Quantity (PWSQ) (C+D)	31.0		28.5	

MMCF: Millions of cubic feet

MMBF: Millions of board feet

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65.1 - Exhibit 02

Planned Timber Sale Program

With a Departure in the First Decade

Annual Average Volume Outputs for 1st and 2nd Decade

Sustained Yield Limit (SYL)	50.0 MMCF			
	First Decade		Second Decade	
	MMCF	MMBF	MMCF	MMBF
Departure increment	10.0		0	
Departure Limit	60.0		50.0	
Timber Products	Volumes other than salvage or sanitation volumes that meet timber product utilization standards			
Lands suitable for timber production				
A1. Sawtimber	40	200.0	40.0	200.0
A2. Other products	8.0		8.0	
Lands not suitable for timber production				
B1. Sawtimber	10.0	50.0	1.0	5.0
B2. Other products	2.0		0.2	
C. Projected Timber Sale Quantity (PTSQ) (A1+A2+B1+B2)	60.0	250.0	49.2	205.0
Other Estimated Wood Products	Fuelwood, biomass, and other volumes that do not meet timber product utilization standards			
	MMCF	Tons	MMCF	Tons
D. Fuelwood	6.0	90.0	5.0	75.0
E. Projected Wood Sale Quantity (PWSQ) (C+D)	66.0		54.2	

MMCF: Millions of cubic feet

MMBF: Millions of board feet