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## Vegetation Management

### Background

*Background still under development. Many of the standards for vegetation management plan components are required for meeting the intent of the National Forest Management Act.*

### Desired Conditions

- Vegetation management methods consider land management plan resource objectives, site capabilities and limitations.
- Silvicultural tools provide a wide variety of options to meet many different resource objectives to provide for species composition, structure and function throughout age classes and lifecycles.
- Oak, other hard mast and soft mast producing species are encouraged by treating stands where such seedlings and saplings are present to favor growth of these species and limit competition from other species in support of multiple-use objectives.
- Forest products are utilized to the extent practicable from timber sale areas, while meeting habitat, restoration, resiliency, and old growth goals.
- Regeneration openings maximize benefits for wildlife habitat, compositional and structural diversity, increasing forest resiliency and consider scenery objectives.
- Vegetation management supports forest, ecological or biological research needs by maintaining existing research plots and providing opportunities for future research.
- Management decisions are informed by the best available scientific information.
- Trees and the products derived from managed lands are highly valued forest resources carefully managed to achieve the desired condition of a given area in a cost-effective manner. For societal use, forest products vary from high quality logs for veneer and dimension lumber to small diameter to small diameter logs for pulp, biomass and firewood.
- Forest management activities to increase resiliency strengthen local communities, by providing a diversity of products that support job and helps maintain a way of life long associated with living near the national forests.

### Standards

- Harvesting for the sole purpose of timber production shall only occur on lands suited for timber production (64.11).
- Timber production should not occur on hydic<sup>1</sup> soils. Project specific determinations of hydic soil locations may occur.
- Timber harvest shall be carried out consistent with the protection of soil, watershed, fish, wildlife, recreation, and scenic and heritage resources (64.25).

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<sup>1</sup> Hydic soil is soil which is permanently or seasonally saturated by water, resulting in anaerobic conditions.

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- Timber harvest shall occur only where
  - a site specific finding determines that soil, slope, or watershed conditions would not be irreversibly damaged (64.12).
  - there is assurance that such lands can be adequately restocked within 5 years after harvest (64.14).
  - protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water (64.13).
  - the harvesting system is not selected primarily because it will give the greatest dollar return or unit output of timber (64.15).
- Harvest of trees on lands classified as not suited for timber production is allowed to meet management objectives including the following:
  - To improve, restore, or maintain forest ecosystem health and resiliency
  - To create or maintain desired wildlife habitat diversity
  - To mitigate climate change influences
  - To provide for wildlife and fish habitat improvements, allow removal of stumps with attached root wads.
  - Create, restore, maintain or enhance NRV structural and/or age class conditions.
  - To provide for safety of forest users, such as hazard-tree removal or life threatening emergency situations
  - To meet or restore habitat objectives for federally threatened or endangered animals or plants, and species of conservation concern.
  - To improve or restore scenic quality by opening scenic vistas or by improving vegetative variety.
  - To accomplish construction, reconstruction, and maintenance objectives for roads trails and recreation management.
  - For wildfire management purposes such as creating control lines, escape routes, fuel breaks, or safety zones.
  - To accommodate special use permits and mineral leases.
  - For research, demonstration or education purposes.
  - Salvage or sanitation harvesting of trees or stands that are substantially damaged by fire, windthrow, insect or disease attack, other catastrophe or which are in imminent danger from insect or disease attack (36 CFR 219.11(C)).
- A site-specific review will be needed to determine the appropriate logging systems for management on sustained slopes (> 200ft) over 40 % slope.
- Design, construct, and maintain erosion control features to meet soil and water quality standards. In particular:
  - Follow North Carolina performance standards as outlined in Forest Practices Guidelines Related to Water Quality (FPGs) by implementing effective soil and water Best Management Practices such as those outlined by the NC Department of Forest Resources.
  - Minimize stream crossings and avoid springs, seeps and hydric soils.
  - To cross established stream channels during logging, use temporary bridges when feasible. Dry ephemeral channels may be crossed without a constructed crossing being sure to avoid storm flow diversion and minimize erosion.

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- In any established stream channel, including ephemeral channels timber shall not be skid, nor shall equipment be operated.
  - In valley bottoms that where soil disturbance may create new channels, avoid skidding logs.
  - During skidding operations, choose skid trails (not excavated) over skid roads (excavated) and skid logs over logging slash placed in the travel way when feasible to avoid long-term soil impacts.
  - Avoid skidding during wet soil periods and through wet areas.
  - In cable logging units, use cable that suspends at least one end of the log on sustained slopes over 40% unless site-specific analysis determines that other logging methods meet soil and water protection standards.
  - When yarding across perennial stream channels, springs and seeps, the entire log shall be suspended. When needed, create skyline corridors not to exceed 20 feet in width through streamside zones by cutting the overstory to prevent uprooting of trees. These logs can be harvested unless they would benefit the streamside zone.
  - Minimize “stacking” multiple skid roads on steep slopes. Consider obliterating legacy skid roads on steep slopes where soil or water quality is a concern.
  - In stands where tree planting occurs, use the following stocking guide in trees per acre (tpa). Stocking will vary based on the desired conditions for the community, including restoration and resiliency goals, timber production, the ecozone, and the future structure desired. Restocking may occur outside the desired range below, with a project specific determination.

**Five year stocking objectives for stands that receive planting after harvest.**

Planting Stock	Minimum (tpa)	Desired Range (tpa)	Maximum (tpa)
Hardwoods (All Species)	100	250 – 350	500
Mixed Pine-Hardwood	300	400 – 600	900
Pines	300	500 – 700	900
Spruce & Fir	300	500 – 700	900

\*Planted stock should generally be free-to-grow at the end of the five year assessment window. Use surveys to determine if stand improvement treatments are required at or after that time.

- Use the following stocking guidelines for natural regeneration. Stocking levels will be based on the percent (%) of 1/100 acre sample plots occupied by at least one desirable stem in a free to grow position on or before the age of 5. Project specific determinations of adequate restocking may occur.
  - Minimum Stocking Levels for primary and secondary timber production objectives or those requiring future full site utilization = 80%

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- Minimum Stocking Levels for management objectives requiring less than future full site utilization = 30% to 80% Use the following stocking guide for stands that receive an intermediate treatment and the stand has trees of merchantable size (5 year restocking requirement does not apply). Project specific determinations of adequate restocking may occur.

Intermediate Harvest	Desired Stocking	Adequate Stocking
Thinning	60 to 70% stocking <sup>2</sup>	60 to 80% stocking
Woodland	30 to 50% Canopy Closure	< 60% Canopy Closure
Permanent Opening*	Only trees desired by opening goals and objectives	
Salvage or Sanitation#	All remaining healthy and un-damaged or un-susceptible trees unless their harvest is required by prescription.	

\*Based on desired condition. Requires land suitability change in FSVeg.

#When salvage or sanitation occurs in disturbances of complete overstory removal apply regeneration based stocking standards.

When selecting retention vegetation for wildlife habitat diversity:

- Hard and soft mast producing species shall be emphasized, including mast-bearing trees, grapes, berries, and fruit trees to enhance foraging opportunities for species such as white-tailed deer, wild turkey, black bear, song birds, and small mammals.
- Native trees with exfoliating bark and natural crevices to provide roosting habitat for bats shall be emphasized. Consider current research, (such as USFWS, NCWRC, North Carolina Bat Working Group (NCBWG), or other relevant guidance) to determine bat roost tree species and condition for retention.
- Maintain least 2 snags ( $\geq 15''$  DBH) per acre across a project area (including activity areas and the immediate landscape) to enhance wildlife habitat diversity for species such as woodpeckers and other cavity nesting birds, except where such snags pose a threat to human health or safety. Favor snags along edge of openings or combined with other leave trees to reduce threats to human health and safety during vegetation management activities.
- All potential bear dens (i.e. those exhibiting cavities and other denning conditions), including standing live and dead trees  $\geq 22''$  DBH shall be retained during vegetation management activities, except where human safety is of concern.
- Downed woody debris of various sizes, including, where available, some that are at least 10'' DBH and 10 feet long, shall be retained during vegetation management activities to provide habitat for salamanders and other cover- and moisture-associated wildlife and drumming logs for grouse. Retained downed woody debris may consist of existing downed wood and/or new logging slash.
- Uneven-aged harvest methods entry cycles will vary from 5-40 years depending upon desired future conditions and management objectives. The maximum size limit of group

<sup>2</sup> An appropriate measure of stocking (relative density, stand density index, etc) above an understocked condition.

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selection openings is less than 2 acres, except where presence of advanced growth species requires larger openings or specific habitat conditions are desired.

- Under uneven-aged harvest systems, such openings may be clustered closer than 330 feet as long as their combined acreage (open) does not exceed the maximum opening size) in any single entry.
- Even-aged regeneration cutting will be used only where the interdisciplinary review process has been completed (64.23).
- Use the following as minimum rotations for even-aged management.

Community & Ecozone	Even-aged Management
	Years
Spruce – Fir	80
Northern Hardwood	80
High Elevation Red Oak	80
Dry Oak	60
Dry - Mesic Oak	80
Mesic Oak	80
Rich Cove	70
Acidic Cove	70
Shortleaf Pine	60
Pine – Oak Heath	50
Flood Plain	80
White Pine	60

- Limit the size of openings created in one harvest operation under even-aged regeneration objectives to 40 acres in all hardwood and spruce- fir ecozones. Within the shortleaf pine ecozone or on appropriate shortleaf pine sites<sup>3</sup> even-aged opening sizes are limited to a maximum of 80 acres in size (36 CFR 219.11(d)). The following exceptions apply to both:
  - 1) Where pine forest types exist in an offsite condition, they may be removed through even-aged regeneration methods (up to 80 acres per harvest unit), where ecologic objectives require restoration to another more appropriate forest community such as dry oak, dry mesic oak, mesic oak, shortleaf, cove or high elevation red oak communities to increase resiliency (36CFR 219.11(d)(4)) (Sec 64.21 2012 planning rule).

<sup>3</sup> The shortleaf pine community is one of the southern pine forest types referenced in 36 CFR 219.11(d)

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- 2) Proposals for larger openings (than above), on an individual timber sale basis, are subject to a 60-day public notification and review by the Regional Forester;
  - 3) Larger openings may be the result of natural catastrophic conditions of fire, insect or disease attack or windstorm;
- Areas managed or to be managed as permanent are not included in calculations of opening size, even when within or adjacent to created even-aged temporary openings.
  - Clearcutting will be used only where determined to be the optimal method or where site specific finding is determined to be optimal method for one of the purposes described below (64.22).
    - 1) To restore species compositions more appropriately suites to site, climatic or geographic conditions.
    - 2) To establish, enhance, restore or maintain habitat for threatened endangered or sensitive species.
    - 3) To enhance wildlife habitat or water yield values, or to provide for recreation sites, scenic vistas, utility lines, road corridors facility sites, reservoirs, or similar development.
    - 4) To rehabilitate or restore lands adversely impacted by events such as fires, windstorms, or insect or disease infestations.
    - 5) To preclude, minimize or mitigate the occurrence of potentially adverse impacts from insect or disease infestations, windthrow, or other factors affecting forest health.
    - 6) To provide for the establishment and growth of desired trees or other shade intolerant vegetation.
    - 7) To rehabilitate poorly stocked stands resulting from past management practices or natural events.
    - 8) To meet research, demonstration, or educational needs.
  - Use other even-aged regeneration methods only where determined to be appropriate and where a project specific finding determines the even-aged cut is appropriate (64.22b).
  - An even-aged or two-aged regeneration area will no longer be considered a temporary opening when:
    - 1) It has reached a minimum age of 5 years and has been certified stocked and;
    - 2) The young forest canopy has closed initiating the stem exclusion phase of stand dynamics (*Citation?*). This age is variable based of species composition, ecozone, and site productivity of stand.
  - Even-aged regeneration cut blocks will be shaped and blended with the natural terrain (64.24) to meet scenery, wildlife habitat, restoration, and resiliency objectives.
  - Separate even-aged or two-aged harvest units from each other by a minimum distance of 330 feet (5 chains). In areas of high scenic interest (Class A) a distance of 660 feet may be desired.
  - Even-aged or two-aged regeneration cutting may be located adjacent to uneven-aged stands at any time.

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- Even-ages stands shall generally have reached culmination of mean annual increment (CMAI) before regeneration harvests, except for the following (64.26):
  - a) Silvicultural activities that are not designed to regenerate even-aged stands. Examples include thinning, stand improvement, uneven-aged systems, etc.)
  - b) Damaged stands (e.g. fire, wind, or other catastrophe) or those in imminent danger from insect or disease attack (oak decline, EAB, Gypsy Moth, etc.).
  - c) Timber harvest on lands not suited for timber production.
  - d) When shorter rotations are needed to meet age class distribution goals.
- CMAI for relevant community groups are listed below. If needed, strategically distribute age classes for habitat requirements, restoration, resiliency, timber production, diversity, or enhancement of other resources.

Community & Ecozone	CMAI Age (Years)
Spruce – Fir	Will Fill in Based on FVS Data and include
Northern Hardwood	procedures followed in DEIS
High Elevation Red Oak	
Dry Oak	
Dry - Mesic Oak	
Mesic Oak	
Rich Cove	
Acidic Cove	
Shortleaf Pine	
Pine – Oak Heath	
Flood Plain	
White Pine	

- There are no spacing requirements for salvage treatments.

## Guidelines

- For vegetation management treatments, road and skid trail locations least likely to cause damage to soil and water resources should be selected. Use existing roads when feasible.
- Removal of mature tree stem wood or whole tree harvest for biomass should not occur in areas at risk for base cation depletion unless field study determines base cation risk isn't warranted or mitigation of cation removal can be achieved.
- Existing, Regional progeny tests and improved seed production areas should be maintained.
- Soft mast producing species (dogwood, black gum, hawthorne, serviceberry, etc.) should be maintained during vegetation management treatments when consistent with overall restoration, resiliency, regeneration and species composition objectives.

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- When regenerating forest stands:
  - Regeneration should be native tree species that commonly occur naturally on similar sites within that community or ecozone and that are expected to be resilient to climatic changes.
    - Natural regeneration should be emphasized in all communities but especially hardwood forest types and ecozones.
    - Artificial regeneration should be used where needed to increase future mast production, increase species diversity or abundance, or restore lost species. Artificial regeneration should use genetically local and native improved seeds and seedlings, and selection of planting stock should be appropriate for reasonably anticipated changes to climate.
- Sizes of even-aged, two-aged, and uneven-aged regeneration openings should be varied based on management area direction and desired future conditions.
- Where management objectives include regeneration of advance growth dependent species, the desired future stocking of these species should be assured through use of pre-harvest site preparation, planting, and shelter wood treatments.
- Develop of advance growth dependent species should be promoted utilizing treatments that ensure establishment and growth or promote the development of advanced competitive regeneration.
- Stand improvement practices should be used to manage stages of intermediate stand development.

## Management Approaches

- *Feb 2016 Note: The Forest Service has received a request to explore Forest Stewardship Council or other third party certification for land management activities. We are continuing to look into this.*
- Use current condition assessments (including gate 1 inventory: Common Stand Exams) to update the known habitat and age class conditions present within project areas including both manmade and natural disturbances.
- Examples of erosion control features to maintain soil and water quality include:
  - Avoid stream crossings during the harvest planning
  - Construct filter windrows at the toe of road fill slopes.
  - Install designed waterbars on steep slopes and/or erodible soils, ensuring appropriate depth (avoid over-constructing), correct angle, leadout-ditch empties onto an adequate buffer, etc.
  - Place logging slash on skid roads and skid trails on all slopes and soil types. At times, as a replacement for waterbars.
- Accomplish advanced regeneration treatments, site preparation and stand improvement through use of hand or machine treatments, prescribed burning, or herbicides.
- Provide opportunities as needed for future testing for seed production. Capitalize on opportunities to support local, regional and national agreements or other opportunities to collect seed and other genetic material supporting species conservation and increased restoration and resiliency efforts.

Consider herbicide treatments of woody stems in seeded skid roads as appropriate for wildlife species such as grouse and golden winged warbler.