AMENDMENT TO THE 2005 OZARK-ST. FRANCIS NATIONAL FORESTS REVISED LAND AND RESOURCE MANAGEMENT PLAN - JULY 2023

PART 2 - STRATEGY - Vegetation and Forest Health

Objective 2 on page 2-10 is updated to read:

OBJ.2 Follow vegetation treatment allocation direction for management areas outlined in Appendix F of this LRMP. Performance Indicator: Through FACTS, annually report the acres allocated by management area and vegetation treatment.

PART 3 - DESIGN CRITERIA - Management Area Standards

The Standard for Scenic Byway Corridors MA1.H-2 on page 3-27 is updated to read:

MA1.H-2 Within 300 feet of Scenic Class 1 designated road, seedtree and clearcut (with or without reserves) are not appropriate silvicultural vegetation treatments.

The Standard for Riparian Corridors MA3.I-3 is updated to read:

MA3.I-3 Thinning and shelterwood with reserves are typically the most appropriate silvicultural vegetation treatments. Regeneration harvest is only conducted in degraded stands where it is needed to ensure long-term recovery of desired riparian forest conditions, and in those cases, reserve trees are retained. Sanitation is only conducted as needed to stop or reduce the spread of an insect infestation or disease outbreak.

APPENDIX F - VEGETATION MANAGEMENT PRACTICES

The entirety of Appendix F pages F1 – F10 is replaced by the attached pages F1 – F16.

Page Left Blank for Two-Sided Printing

APPENDIX F-VEGETATION MANAGEMENT PRACTICES

This appendix evaluates the general appropriateness of various vegetation management practices, with a major focus on silvicultural systems and associated vegetation treatments. This appendix recommends practices that meet NFMA regulations for manipulating vegetation to regenerate stands to desirable native species, usually of the pre-harvest forest types, and manage stand structures to meet Forest Plan desired conditions. Including the information in this appendix as a guide to the vegetation management practices applied on the Ozark-St. Francis National Forest does not remove or add practices authorized by the Forest Plan. It is meant only to provide information on the methods utilized to achieve the results described in the Forest Plan's Vision and Strategy (Part 1 and 2).

Silvicultural Systems

There are three silvicultural systems used to created desired conditions and provide regulated and sustainable yield of wood products.

The EVEN-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting, and re-establishing a stand designed to maintain trees composed of a single age class in which the range of tree ages is usually 20 percent of rotation. This system creates a mosaic of single age class stands across the forestlands suitable for producing forest products, where collectively on the suitable forest land, all age classes are present and maintained. When a stand reaches the desired product objective, usually expressed as the rotation (the time frame for growing the product objective for a given set of environmental conditions) or the specific wood product(s), harvesting is scheduled to remove all or most all of the merchantable trees (from which the desired wood products can be produced) in a stand. On lands suitable for timber production, stands should have also reached the culmination of the mean annual increment of growth. Whether all or some of the merchantable trees are harvested is dependent upon the regeneration method chosen to accomplish the management area objectives. Regeneration, designed to replace desirable tree species, takes place within five years after the final harvest.

The TWO-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting, and re-establishing a stand and maintaining trees of two distinct age classes. The trees in each distinct age class could have tree ages that span up to 20 percent of the rotation. This system creates a mosaic of two-age class stands across the forestlands suitable for timber production, where collectively on the suitable forestland, all age classes are present and maintained. When one age class of the stand reaches the desired product objective, usually expressed as a rotation,

harvesting is scheduled to remove that age class, usually the older age class. In a stand, all merchantable trees (from which wood products can be produced) in the older age class are scheduled for harvest. The resulting stand may be two-aged or tend toward an uneven-aged condition as a consequence of both an extended period of regeneration established and the retention of reserve (green) trees that may represent older age classes. When trees in one of the age classes have reached the desired product objective or rotation, that part of the stand is harvested. This harvest regenerates a new age class of desirable tree species to perpetuate the two-aged stand structure within five years of the removal of an age class.

The UNEVEN-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting, and re-establishing a stand and maintaining trees of three or more distinct age classes. Because this system creates a multi-aged stand structure, rotations are not applicable as a management tool. Instead, periodic inventories of the multi-aged stands provide information about the site's productivity, the species present, their size and growth. From this inventory information, product objectives can be determined, as well as the period of time it takes to grow a marketable volume on a sustainable basis. Additionally, the periodic inventory provided information about the distribution of age classes in the uneven-aged stand. This distribution information is used to plan needed stand improvement practices that adjust the number of trees in each age class to a desired distribution, thus permitting the sustainable production of the product objective. Trees selected for harvest can be dispersed individual trees (i.e., single tree selection) or small groups of trees (i.e., group selection). The system generally maintains a high forest cover across the land while providing a sustained yield of forest products and the orderly growth and development of desired trees with a variety of diameter and ages.

Application of Silvicultural Systems

The selection of which silvicultural system and regeneration method to use is based on the condition of the existing forest stand and the desired condition of the management area of which the stand is a part.

During the period from about 1880 through 1930, much of the lands now managed as the OSFNFs were logged and sometimes burned or badly eroded. Some of the Forests were created from abandoned farmland. Today, these lands have healed and been rejuvenated as a result of Federal investments in tree planting, fire suppression, timber stand improvement, and time. The resultant growth of oak-dominated and southern yellow pine forests consists of essentially even-aged stands. Since becoming National Forest System lands, some stands have been managed for wood production.

The National Forest Management Act (NFMA) and its Federal Regulation require the identifying of forestlands to be used for producing sustainable yields of wood products, thus the need to identify 1) which lands and 2) which silvicultural system are to be used. Although conceptually possible, the random application of mixing uneven-aged, two-aged, and even-aged stands is not practical over the present predominantly even-aged forest. Even though the production of wood products is an objective, equally important objectives are wildlife habitats, water quality, and aesthetics. Even-aged, two-aged, and uneven-aged management practices each create different vegetation conditions and stand structures, and they have different practices and objectives which have limitations when protecting the forest resources is of primary concern. Likewise, each species of tree has unique requirements insofar as light requirements, site productivity, and soil moisture in order to regenerate adequately and grow to maturity. Thus, the silvicultural system chosen must also consider the needs of the desirable tree species occupying the site or the species we wish to regenerate. This revised Forest Plan operates under the principle of management area and silviculture prescriptions, where portions of the Forests have similar environmental conditions, management emphasis, and/or specific multiple resource objectives. Therefore, uneven-aged, two-aged, and even-aged silvicultural system practices will not be applied individually to intersperse the silviculture systems, but rather to portions of management area where they simultaneously contribute to accomplishing other renewable resource objectives and are appropriate for the desirable tree species to be regenerated or tended.

Vegetation Treatment Applications

The following list of vegetation treatments describe silvicultural actions that will be used to manipulate vegetation to meet objectives of controlling stand composition or structure as described in the Forest Plan. Prescriptions are developed as a part of site-specific analysis serving as a written record of the combination of the vegetation treatments recommended to move a stand's conditions toward desired future conditions. Forest managers use these prescriptions as a treatment plan when implementing projects.

When management alters vegetation, the methods, timing, and intensity of the practices determine the level of benefits that can be obtained from the affected resources. It is not practical to attempt to describe all the conditions and reasons for manipulating vegetative conditions. Reasons range from improving forest health to eliminating hazards for public safety. Site-specific implementation of the forest plan is the appropriate place for determining which management practice(s) to use for achieving a specific project objective.

The desired future condition description for each management area should be used as a primary objective to inform decisions regarding selection of vegetation treatments; however, there is some flexibility of vegetation treatment application based on site conditions. In most cases, the goal is to maintain or increase the diversity of species, age distribution, composition, and structure in the stands treated. More guidance regarding the selection of vegetation treatment is found on the following pages. Table F-1 identifies which vegetation treatments are appropriate for use in each management area. Table F-2 summarizes vegetation treatment parameters by community type for indicators such as site index, basal area, and forest plan direction. A detailed description of each of the vegetation treatments along with their purpose and use follows Table F-2.

TABLE F1. Vegetation Treatment Options by Management Area

Management Area (MA)	Vegetation Treatment Number and Abbreviation																	
	100 SW	101 GS	105 STS	107 ST	115 CC	116 IT	117 WSR	118 SAL	119 SAN	120 SP	121 PCT	122 REL	123 UR	124 MR	125 WOM	126 NSSE	127 ERC	128 PB
1.A Designated Wilderness																		
1.B Recommended Wilderness Additions																		
1.C Designated Wild and Scenic Rivers - Recreation and Scenic Sections Only*							X	X	X	X	X	X	X	X	X	X	X	X
1.D Recommended Wild and Scenic Rivers							X	X	X	X	X	X	X	X	X	X	X	X
1.E Experimental Forests	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.F Research Natural Areas																		
1.G Special Interest Areas							X	X	X	X	X	X	X	X	X	X	X	X
1.H Scenic Byway Corridors	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
2.A Ozark Highlands Trail							X	X	X	X	X	X	X	X		X	X	X
2.B State Parks							X	X	X	X	X	X	X	X		X	X	X
2.C Developed Recreation Areas							X	X	X	X	X	X	X	X		X	X	X
2.D Upper Buffalo Dispersed Recreation Area	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.E Wedington Unit Urban Recreation Area	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.F Indian Creek Dispersed Recreation Area	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.A Pine Woodland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.B Oak Woodland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.C Mixed Forest	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.D Oak Decline Restoration Areas	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.E High Quality Forest Products	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.F Old Growth Areas**	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
3.G Crowley's Ridge Upland Hardwood	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.H Mississippi River Bottomland Hardwood	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.I Riparian Corridors***	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X
3.J Pastures and Large Wildlife Openings								X	X						X	X	X	X
3.K Wildlife Emphasis Areas	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

***Vegetation treatments are not allowed in wild sections of MA 1.C**

****In MA 3.F Shelterwood or Seedtree (Treatments 100 or 107) would only be applied with retained reserves**

*****In MA 3.I, Shelterwood (Treatment 100) would only be applied with retained reserves**

100 SW – Shelterwood w/wo Reserves
101 GS – Group Selection
105 STS – Single Tree Selection
107 ST – Seedtree w/wo Reserves
115 CC – Clearcut w/wo Reserves
116 IT – Intermediate Thinning
117 WSR – Woodland and Savannah Restoration Thinning
118 SAL – Salvage
119 SAN – Sanitation
120 SP – Site Preparation
121 PCT – Precommercial Thinning
122 REL – Release
123 UR – Understory Removal
124 MR – Midstory Removal
125 WOM – Wildlife Opening Maintenance
126 NSSE – Native or Suitable Species Establishment
127 ERC – Eastern Redcedar Removal
128 PB – Prescribed Burning

TABLE F2. Vegetation Treatment Parameters by Community Type

Community Type	Desired Basal Area/Site Index	Forest Plan Direction for Desired Condition	Desired Age Class Percent
Dry Oak Forest and Woodland	**Basal Area** Forest: 60-80 Woodland: 40-60 Savanna: 10-40 Glade: 0-40 **Site Index** Forest: 60+ Woodland: 50-60 Savanna: 40-60 Glade: <50	• Maintain 32% of Forest in this Community Type • 41+ Year old Stands Mostly have 60-80% Canopy Closure with a sparse midstory • 30-40% of this Community Type has 10-60% Canopy Closure Concentrated within 3.A, 3.B, 2.E, and 3.K MA's • 2-7 Year Burn Rotation with Every 3rd Burn to be Implemented During Growing Season • 50% Mature (70+ years old) • 25% Old Growth	0-10 at least 6% 0-40 total 25% 41-70 25% 70+ 50%
Shortleaf Pine-Oak Forest and Woodland	**Basal Area** Forest: 60-80 Woodland: 40-60 Savanna: 10-40 Glade: 0-40 **Site Index** Forest: 60+ Woodland: 50-60 Savanna: 40-60 Glade: <50	• Maintain 26% of Forest in This Community Type • 41+ Year old Stands Mostly have 60-80% Canopy Closure • 30-40% of This Community Type has 10-60% Canopy Closure Concentrated within 3.A, 3.B, 2.E, and 3.K MA's • 2-5 Year Burn Rotation with Every 3rd Burn to be Implemented During Growing Season • 40% Mature • 15% Old Growth	0-10 at least 8% 0-40 total 30-35% 41-70 25-30% 70+ 40%

TABLE F2. Vegetation Treatment Parameters by Community Type Continued

Community Type	Desired Basal Area/Site Index	Forest Plan Direction for Desired Condition	Desired Age Class Percent
Dry-Mesic Oak Forest	**Basal Area** Forest: 60-70 **Site Index** Forest: 60+	• Maintain 40% of Forest in This Community Type • 41+ Year old Stands Mostly have 60-80% Canopy Closure • 10-60% Canopy Closure Not Common • 2-7 Year Burn Rotation with Every 3rd Burn to be Implemented During Growing Season • 50% Mature • 20% Old Growth	0-10 at least 6% 0-40 total 25% 41-70 25% 70+ 50%
Mesic Hardwood Forest	**Basal Area** Forest: 60-80 **Site Index** N/A	• Currently <1% of Forest is in This Community Type and Will be Maintained • Canopies Consist of >50% of American Beech, Magnolia, Maple, and/or Walnut • This Community is not Typically Regenerated • Vegetation Management is Uncommon, but may Occur Where Needed to Provide for Sustainability of This Community • Fire Rarely Enters This Community due to Location and Vegetation	N/A
Riparian Forest	**Basal Area** Forest: 60-80 **Site Index** N/A	• Currently 1% of Forest is in This Community Type and Will be Maintained • Canopies Consist of >50% of ash, elm, Sycamore, River Birch, Sugarberry, Cottonwood, and Willow • Woodland Densities 10-60 Canopy Closure are not Common, but may Occur in Frequently Flooded Areas and in Areas Occupied by Canebrakes • Vegetation Management is Used to Create and Maintain Desired Structural Conditions • Fire is Relatively Infrequent but Occurs at 7-10 Year Intervals	N/A

TABLE F2. Vegetation Treatment Parameters by Community Type Continued

Community Type	Desired Basal Area/Site Index	Forest Plan Direction for Desired Condition	Desired Age Class Percent
Loess Slope Forest*	**Basal Area** Forest: 60-80 **Site Index** Forest: 60+	• Maintain 86% of Forest in This Community Type on St.-Francis National Forest • 41+ Year old Stands Mostly have 60-80% Canopy Closure • 10-60% Canopy Closure Absent or Uncommon • 5-10 Year Burn Rotation with Every 3rd Burn to be Implemented During Growing Season • 60% Mature • 20% Old Growth	0-10 at least 5% 0-40 total 20% 41-70 20% 70+ 60%
Bottomland and Floodplain Forest**	**Basal Area** Forest: 60-80 **Site Index** Forest: 60+	• Maintain 13% of Forest in This Community Type on St.-Francis National Forest • 10-60% Canopy Closure Uncommon, but do Occur • 7-10 Year Burn Rotation • 65% Mature • 45% Old Growth	0-10 at least 5% 0-40 total 20% 41-70 15% 70+ 65%

*** On the St Francis NF manage to discourage yellow poplar found across the uplands.**
**** On the St Francis NF manage to maintain and regenerate bottomland stands of oak, hickory, pecan, sycamore, bald cypress and other associated species.**

Note: Across all community types, maintain more than 50 percent of the total forest and woodland acreage in a mature condition. Over time, develop old growth conditions on approximately 20 percent of forested acres. Maintain a range of 3.8 to 6.8 percent of the total forest and woodland acreage in regenerating forest conditions (0 to 10 years old).

3.F Old Growth - In the Forest Plan there have been several areas identified and will be managed long term to develop and maintain these conditions. As the forest ages there will be other areas identified through field inventory outside of MA 3.F that may be managed to develop or maintain old growth character.

Vegetation Treatments Description and Primary Purpose/Use

The following section describes each proposed vegetation treatment within Table F1 and their primary purpose or use.

100 Shelterwood with or without Reserves

- **Description** - This treatment is achieved by removing most trees typically from a mature even-age stand and leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment. A target basal area range between 30 to 50 square feet per acre will allow for site specific determination of shade intolerant species dominance on the low end of the basal area range and shade intermediate species dominance on the high end. The sequence of treatments can include three types of cuttings: (a) an optional preparatory cut to enhance conditions for seed production, (b) an establishment cut to prepare the seed bed and to create a new age class, and (c) an optional removal cut to release established regeneration from competition with the overstory.

- **Primary Purpose/Use** - This harvesting method is designed to regenerate aging hardwood stands (70+ years old), create early seral stage habitat lacking across the Forest, and encourage a mix of pine and hardwood communities. Stands are typically not candidates for regeneration treatments until later seral stages. This may be 80-90 years of age in general forest, even older in woodland or savannah conditions up to 140 years or more. In stands managed for old growth, regeneration is usually not considered until over 180 years, if at all, should forest health concerns deem necessary. Acres harvested by this method help achieve a diverse age class distribution across the landscape as described by the Forest Plan (see table F2). The semi-shaded environment created by the remaining residual trees provides the ideal conditions for the establishment, growth, and development of desired tree species. This harvest method is sometimes used in aging pine stands when additional residual trees are needed for visual reasons or for additional seed source to establish regeneration.

101 Group Selection

- **Description** - This treatment is used to regenerate uneven-aged stands. Regeneration growth and yield are regulated to create a landscape consisting of an aggregation of groups. Every 15 to 20 years trees are cut, in small groups approximately 1/6th the size of the stand to establish new age classes at each

harvest cycle. Across the landscape and within the groups, patches of canopy openings typically 0.5 to 5 acres in size are created to support the establishment and recruitment of more shade-intolerant species; smaller openings provide microenvironments suitable for shade-tolerant regeneration. Between the groups, trees are thinned to 50 – 70 square feet of basal area to reduce stem density.

- **Primary Purpose/Use** - This treatment is used to regenerate aging hardwood and pine stands within visually sensitive areas. Regenerating these stands over time provides patches of early successional habitat helping to achieve the desired age class distribution as described by the Forest Plan. The environment created by the remaining residual trees provide for the establishment, growth, and development of young trees.

105 Single Tree Selection

- **Description** - This treatment is used to provide space for regeneration, create stands of mixed ages and sizes and to maintain an uneven-aged condition following an inverse "j" shaped curve (distribution of number of trees over diameter at breast height (dbh). This treatment involves removal of individual trees of all size classes, somewhat uniformly, throughout a stand to promote the growth of the residual trees. Trees are thinned to a range of 40 to 60 square feet of basal area through a series of cuts spaced approximately 10 years apart to achieve a stand having three or more distinct age classes, each separated by 20 years or more.

- **Primary Purpose/Use** - The predominate use of this uneven aged treatment is to slowly regenerate shade tolerant hardwood and pine stands within visually sensitive areas where more residual overstory (trees) of multiple diameters and ages are needed to remain than with even-aged regeneration methods.

107 Seedtree with or without Reserves

- **Description** - This treatment is used to ensure dominance of native forest types is sustained by creating a new age class. A target basal area of 10 to 20 square feet per acre leaving a small number of widely dispersed trees retained for seed production and to produce a new age class in a fully exposed microenvironment. An optional final removal cut to release established regeneration from overstory competition may also be used.

- **Primary Purpose/Use** - This harvesting treatment is designed to regenerate aging pine stands (70+ years old), create early seral stage habitat lacking across

the Forest, and encourage a mix of pine and hardwood communities. Stands are typically not candidates for regeneration treatments until later seral stages. This may be 80-90 years of age in general forest, even older in woodland or savannah conditions up to 140 years or more. In stands managed for old growth, regeneration is usually not considered until over 180 years, if at all, should forest health concerns deem necessary. Acres harvested by this method help achieve a diverse age class distribution across the landscape as described by the Forest Plan (see table F2). The environment created by the remaining residual trees provide for the establishment, growth, and development of shade intolerant young trees. This harvest method is sometimes used in hardwood stands when few seed trees exist due to damage (ice storm, insects, disease) or when desirable natural regeneration already exists.

115 Clearcut with or without Reserves

- **Description** - This treatment is used to regenerate an even-aged stand. This treatment is to be used in accordance with Forest-wide Standard FW14. A target basal area ranging between 0 to 10 square feet is achieved by removing essentially all trees through a single establishment cut to remove the overstory, prepare the seed bed and create a new age class. Regeneration can be from natural seeding, direct seeding, planted seedlings, coppice, or advance reproduction. Reserve trees may be removed to keep the stand within an even-aged system or may be retained and managed as a two-aged system if needed to meet objectives other than regeneration (e.g., wildlife habitat enhancement, scenery management etc.).

- **Primary Purpose/Use** - The predominate use of this treatment is to replace aging stands of mostly off-site or non-native species. It can also be used in concert with salvage and sanitation removal (see 118/119) for forest health reasons such as insects, disease, pathogens, or severe disturbances (e.g., Ice storm damage affecting crowns throughout stand) that are significant enough to warrant entire stand replacement. Regenerating these stands with native species provides early seral habitat lacking across the Forest and helps to balance the age class distribution as required by the Forest Plan. The open environment created provides for the growth and development of desirable young trees. Occasionally all trees need to be removed for future management objectives such as wildlife opening creation, progeny test, right of way creation for road or utility lines, scenic vistas, facilities, or reservoirs.

116 Intermediate Thinning

- **Description** - This treatment is used to reduce stand density, improve growth, and enhance forest health in both pine and hardwood forest types. It can be accomplished either by 1) thinning from above; 2) thinning from below; 3) free thinning, or 4) mechanical thinning. Residual basal area for intermediate thinning treatments ranges from 50 - 80 square feet of basal area per acre.

- **Primary Purpose/Use** - This treatment is used in pine and hardwood stands to reduce overstocking (exceeding desired stand density which reduces forest health and the quality of wildlife habitat and creates susceptibility to catastrophic fire, insects, and disease outbreaks). Thinning these stands improves the health and development of remaining trees by reducing competition and freeing up resources. The different types of thinning are determined by site and produce a difference in stand structure. An example of these differences can be seen in free thinning that disregards tree crown position in the canopy thus resulting in a multilayer canopy. Trees selected for removal (harvest) would include those that are damaged, diseased, suppressed, poorly formed, or undesirable species. The spacing of remaining trees would serve as the determinant for removal to achieve the desired canopy closure level for that particular stand. Thinning stands using canopy closure measurements can be hard to implement on the ground. However, we can correlate a basal area range to a canopy closure percent range and receive similar results (Dealy, 1985). Applying thinning treatments creates a more resilient forest and improves wildlife habitat.

117 Woodland and Savannah Restoration Thinning

- **Description** - This treatment involves removal of most of the trees in a stand through manual, mechanical and/or chemical treatments. Thin to a target range of 40 to 60 square feet of basal area for woodland restoration, and to a target range of 0 to 40 square feet of basal area for savanna and glade restoration favoring shade intolerant species in all three instances. Where maintenance with fire is intended, remove eastern red cedar (see 127) from the site except those established along the edges of a bluff or where terrain precludes accumulation of sufficient fuels to carry fire.

- **Primary Purpose/Use** - This treatment is generally used to restore historical open conditions and species composition (e.g., woodland, glade community, savanna etc.) on south to west facing aspects with mid to lower site indexes, or mid to upper slopes and ridgetops. It involves heavily thinning stands using

manual, mechanical and/or chemical treatments below traditional stocking levels in conjunction with prescribed burning with the intent to establish and develop understory grasses, herbaceous plants, and forbs. Helps achieve the target canopy closure, desired species composition, and improves wildlife habitat in these locations. This treatment may produce lateral growth in more open conditions which in older stands can also be considered good characteristics of potential old growth structure.

118 Salvage

- **Description** - This treatment is used to remove dead, dying or damaged trees from stands following disturbance events to recover some merchantable value of damaged stems.
- **Primary Purpose/Use** - This treatment is used to reduce quantities of host material for damaging insects and pathogens, reduce fuel loads, and/or reduce overhead hazards in developed areas and along roads.

119 Sanitation

- **Description** - This treatment is used where disease outbreaks or insect infestations become established or begin to spread and involves the removal of dead, dying, or damaged trees. This treatment serves to stop or reduce the actual or anticipated spread of an insect infestation or disease outbreak.
- **Primary Purpose/Use** - This treatment involves the removal of dead, damaged, and susceptible trees. Factors considered when determining the necessity of prescribing this treatment and the extent of susceptible trees to be removed will depend on the pest or pathogen and the environmental conditions at the site.

120 Site Preparation

- **Description** - This treatment is used prior to afforestation or reforestation to prepare the seed bed for seed fall or planting. Site preparation may include manual, mechanical, and/or chemical methods individually or in combination.
- **Primary Purpose/Use** - This treatment is used to control vegetation competing with desired species regeneration. The site is prepared for natural regeneration or planting trees by creating conditions conducive to the establishment and growth of regeneration.

121 Precommercial Thinning

- **Description** - This treatment is used to shape and/or improve species composition and quality of a stand through reductions in stocking levels. Trees too small to have commercial value are removed manually, mechanically, or chemically to improve growth and vigor of desired species. Trees selected to be cut/treated would be those that were damaged, diseased, suppressed and poorly formed. Spacing of remaining trees would then serve as the determinant for removal.

- **Primary Purpose/Use** - This treatment is used to shape species composition and improve growing conditions in overstocked, young stands through reductions in stocking levels. At this stage of stand development, the trees are too small to have commercial value and are treated manually, mechanically, or chemically.

122 Release

- **Description** - This treatment is used in both pine and hardwood stands with trees approximately 0-15 years old that are overstocked but have yet to reach sufficient size to be sold. Selected trees would be released (freed) from overtopping or competing vegetation manually, mechanically, or chemically to improve growth of desired species. Trees selected to be cut/treated would be those that were damaged, diseased, suppressed and poorly formed. Spacing of remaining trees would then serve as the determinant for removal.

- **Primary Purpose/Use** - This treatment is used to free young trees from undesirable overtopping competition and to improve the species composition, structure, condition, health, and growth of desirable regeneration. Applying this treatment would leave a healthier and more vigorous stand of trees.

123 Understory Removal

- **Description** - This treatment is used to remove or reduce undesirable or offsite saplings/seedlings, brush, and herbaceous vegetation in the understory when densities are hindering the establishment or growth of desired species. Targeted vegetation can be removed manually, mechanically, or chemically to improve growth and vigor of desired species left in the stand. Stems 1" or less in dbh will be treated.

- **Primary Purpose/Use** - See 124 Midstory Removal

124 Midstory Removal

- **Description** - This treatment is used to remove midstory trees 1 to 8 inches in diameter. Targeted stems are removed either through individual treatments or a combination of manual, mechanical, or chemical treatments. Felled stems are typically left on site but may be removed where accessible for utilization as forest products.

- **Primary Purpose/Use** - Treatments 123 and 124 have the same general purpose and are both used as a silvicultural (forestry) treatment and as a treatment to restore and maintain open forests, woodlands, savannas, and glades. Silviculturally, they are used at various stages of stand development to control competing vegetation which promotes the establishment, growth, and development of desirable seedlings and saplings. As a restoration treatment they create structural diversity both vertically and horizontally across the landscape and improve the establishment and growth of other desirable understory species (native cane, grasses and forbs) used by wildlife.

125 Wildlife Opening Maintenance

- **Description** - This treatment is used to improve and/or maintain wildlife openings that are dominated by grasses, forbs, and shrubs. Activities may include a combination of fallow disking, application of lime and fertilizer, herbicide treatment, mowing, prescribed fire, seeding, or planting vegetation.

- **Primary Purpose/Use** - This treatment has the primary purpose of maintaining current and future wildlife openings to consistently provide early seral habitat currently lacking across the Forest and to provide supplemental forage to support game populations. This treatment consists of an array of activities (seeding, fertilizing, brush control, discing, etc.) to maintain wildlife openings over time.

126 Native or Suitable Species Establishment

- **Description** - Planting, transplanting, or seeding any native or suitable species to meet stocking level requirements or achieve management objectives for a site.

- **Primary Purpose/Use -** In most cases, the purpose of the treatment is to establish and maintain native vegetation and trees. It involves planting native trees to supplement natural regeneration if needed. Planting, transplanting, or seeding other types of vegetation (native or other suitable species) provides cover/forage for wildlife, pollinator habitat, erosion control, and/or restores native

cane. In general, only native tree species are planted within the forested landscapes of the Ozark-St. Francis. Exceptions are given to suitable species that are neither native nor invasive and only used within designated wildlife openings as hard and soft mast producers (i.e., plums) or herbaceous vegetation (i.e., annual rye) planted in high soil erosion areas as soil stabilizers until native cool and warm season grasses successfully establish.

127 Eastern Redcedar (ERC) Removal

- **Description** - This treatment is used to remove eastern red cedar encroachment or to reduce the density of cedar thickets. Targeted stems are removed either through one or a combination of manual, mechanical, or chemical treatments.

- **Primary Purpose/Use** - ERC is a pioneer species that readily encroaches into forests, woodlands, savannas, glades, as well as fields. The purpose of this treatment is to remove ERC to restore and maintain these areas as they were historically in conjunction with frequent low intensity fires.

128 Prescribed Burning

- **Description** - This treatment is used to restore and maintain historic fire regimes and fire adapted ecosystems. It is also used for fuel load reduction and vegetation control. It would be applied alone or incorporated as an element in combination with other vegetation treatments (e.g., Site Preparation, Precommercial Thinning, Release, Understory/Midstory Removal, etc.) to address the specific needs and objectives for a stand or area.

- **Primary Purpose/Use** - The majority of the Forest has evolved as a fire adapted ecosystem in which fire has been absent for many years creating an overall unnatural condition. The use/reintroduction of fire assists in restoring the area to its historical structure, species composition, canopy closure, fuel loads, and helps meet desired future conditions for Forest ecosystems. It also reduces the risk of catastrophic wildfires, especially in the Wildland Urban Interface.