

Desired Conditions Descriptions by Forest Types

PONDEROSA PINE (bunchgrass and Gambel oak subtypes)

The ponderosa pine forest vegetation community includes two subtypes: Ponderosa pine bunchgrass and ponderosa pine Gambel oak. The ponderosa pine forest vegetation community generally occurs at elevations ranging from approximately 5,000 to 9,000 feet. It is dominated by ponderosa pine and commonly includes other species such as oak, juniper, and pinyon. More infrequently species such as aspen, Douglas-fir, white fir, and blue spruce may also be present, and may occur as individual trees. This forest vegetation community typically occurs with an understory of grasses and forbs although it sometimes includes shrubs.

Landscape-scale conditions (10,000 + acres)

At the landscape scale, the ponderosa pine forest vegetation community is composed of trees from structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably-sized open grass-forb-shrub interspaces, an association similar to historic patterns. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites, based upon the make-up and aggregation of mid-scale units. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. In the Gambel oak sub-type, all sizes and ages of oak trees are present. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead

trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

The ponderosa pine forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (>3 inch diameter), all well-distributed throughout the landscape. Ponderosa pine snags are typically 18 inches or greater at DBH and average 1 to 2 snags per acre. In the Gambel oak subtype, large oak snags (>10 inches) are a well-distributed component. Downed logs (>12 inch diameter at mid-point, >8 feet long) average 3 logs per acre within the forested area of the landscape. Coarse woody debris, including downed logs, ranges from 5 to 14 tons per acre with areas of Ponderosa Pine Gambel oak in the lower range and ponderosa pine bunchgrass in the higher range.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, and wind), including snags, downed logs, and old trees. Grasses, forbs, shrubs, and needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Frequent, low severity fires (Fire Regime I) are characteristic in this type, including throughout goshawk home ranges. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-scale conditions (100 -1,000 acres)

At the mid-scale the ponderosa pine forest vegetation community is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites. Tree density within forested areas generally ranges from 20 to 90 square foot basal area per acre.

The mosaic of tree groups generally comprises an uneven-aged forest with all age classes present. Infrequently patches of even-aged forest structure are present. Disturbances sustain the overall age and structural distribution.

Fires burn primarily on the forest floor and do not spread between tree groups as crown fire.

Fine-scale conditions (<10 acres)

Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Openings surrounding tree groups are variably-shaped and comprised of open grass-forb-shrub interspaces. Some openings contain individual trees. Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Size of tree groups typically is less than 1 acre, and may range from a few trees to 0.75 acres, but occasionally 1+ acres in size (Table 4). Groups at the mid-aged to old stages consist of 2 to 70+ trees per group. A spectrum of group sizes is desired.

PONDEROSA PINE - Evergreen Oak

Ponderosa Pine - Evergreen Oak generally occurs at elevations ranging from approximately 5,000 to 6,500 feet. It is dominated by ponderosa pine and can be distinguished from the Ponderosa Pine Forest by somewhat more even-aged dynamics, and by one or more well-represented evergreen oak species (e.g., Emory oak, Arizona white oak, silverleaf oak, grey oak). Other species include juniper species, pinyon pine species, and Arizona cypress in some locations. Ponderosa Pine - Evergreen Oak has two subclasses; one with a more continuous layer of perennial grasses and a relatively minor shrub component; and one with an understory of primarily evergreen shrubs including manzanita, turbinella oak, sumac species, and mountain mahogany species.

PONDEROSA PINE - Evergreen Oak (perennial grasses subtype)

Landscape-scale conditions (10,000+ acres)

At the landscape scale, the ponderosa pine-evergreen oak perennial grasses sub-type is composed of trees from structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps and groups of trees interspersed within variably-sized open grass-forbs-shrub interspaces similar to historic patterns. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites. Shrubs occur in low to moderate densities so as not inhibit ponderosa pine regeneration. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. All structural stages of oak are present with old trees occurring as dominant

individuals, and small groups occurring typically within openings. Denser overall tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

The ponderosa pine –evergreen oak perennial grasses sub-type is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (>3 inch diameter), all well-distributed throughout the landscape. Ponderosa pine snags are typically 18 inches or greater at DBH and average 1 to 2 snags per acre. Large oak snags (>10 inches) are a well-distributed component. Downed logs (>12 inch diameter at mid-point, >8 feet long) average 3 logs per acre within the forested area of the landscape. Coarse woody debris, including downed logs, ranges from 3 to 10 tons per acre.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from natural disturbances (e.g. insects, diseases, fire, and wind), including old growth. Grasses, forbs, shrubs, and needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Frequent, primarily low severity fires (Fire Regime I) are characteristic including throughout goshawk home ranges.

Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-scale conditions (100 - 1000 acres)

At the mid-scale the ponderosa pine-evergreen oak perennial grasses sub-type is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites. Tree density within forested areas generally ranges from 20 to 90 square foot basal area per acre.

The mosaic of tree groups generally comprises an uneven-aged forest with all age classes and structural stages present. Small areas of even-aged forest structure are present. The mix of natural disturbances sustains the overall age and structural distribution.

Fires burn primarily on the forest floor and do not typically spread between tree groups as crown fire. Mixed severity fires occur at less frequency and over smaller spatial extents than low severity fires occur.

Fine-scale conditions (<10 acres)

At the fine scale, trees typically occur in small groups in which they are variably-spaced with some tight clumps. Crowns of trees within the mid- to old-age groups are interlocking or nearly interlocking. Openings in between tree groups are variably-shaped and comprised of open grass-forb-shrub interspaces. Some openings contain individual trees, including large open-grown oaks. Trees within groups are of similar or variable ages and may contain species other

than ponderosa pine. Size of tree groups typically may range from a few trees to 0.75 acres, but are occasionally 1+ acres in size. Groups at the mid-age to old stages typical range from 2 to 70+ trees. A spectrum of group sizes is desired.

PONDEROSA PINE - Evergreen Oak (evergreen shrub subtype)

Landscape-scale conditions (10,000+ acres)

At the landscape scale, the ponderosa pine-evergreen shrub sub-type is composed of trees from structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open; areas of even-aged structure are present. The forest arrangement is in small clumps and groups of trees interspersed within variably-sized openings of moderate to high-density shrubs and limited grass cover. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. All structural stages of oak are present, with old trees occurring as dominant individuals or in small groups. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

The ponderosa pine –evergreen shrub sub-type is composed predominantly of vigorous trees and shrubs, but declining trees and shrubs are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (>3 inch diameter), all well-

distributed throughout the landscape. Ponderosa pine snags are typically 18 inches or greater at DBH and average 1 to 2 snags per acre; large oak snags (>10 inches) are a well-distributed component. Downed logs (>12 inch diameter at mid-point, >8 feet long) average 3 logs per acre within the forested area of the landscape. Coarse woody debris, including downed logs, ranges from 3 to 10 tons per acre.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from natural disturbances (e.g. insects, diseases, fire, and wind), including old growth. Dwarf-mistletoe occurs in less than 15 percent of host trees in uneven-aged forest structures and less than 25 percent in even-aged forest structures. Limited grasses, forbs, and a moderate density of shrubs, needle cast, and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Low to mixed severity fires (Fire Regimes I and III) are characteristic in this type, including throughout goshawk home ranges. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-scale conditions (100-1000 acres)

At the mid-scale the ponderosa pine-evergreen shrub sub-type is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area. Openings typically range from 10 percent in more productive sites to 70 percent

in the less productive sites. Tree density within forested areas generally ranges from 20 to 90 square foot basal area per acre.

The mosaic of tree groups comprises a mix of even-aged and uneven-aged patches with all age classes and structural stages present. The mix of natural disturbances sustains the overall age and structural distribution.

Fires are of low- to mixed-severity burning on the forest floor as well as in the overstory. Crown fires occur in small patches.

Fine-scale conditions (< 10 acres)

Trees typically occur individually or in small groups in which they are variably-spaced with some tight clumps. Crowns of trees within mid- to old-age groups are interlocking or nearly interlocking. Openings in between tree groups are variably-shaped and comprised of shrubs and limited grass cover. Some openings may contain a high density of shrubs and/or individual trees, including large oaks. Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Size of tree groups typically are greater than 0.5 acre, and may be 1+ acres. A spectrum of group sizes is desired.

DRY MIXED-CONIFER (FREQUENT-FIRE) FORESTS

The dry mixed-conifer forest vegetation community is transitional with increasing elevation between ponderosa pine and wet mixed-conifer forests and generally occurs at elevations ranging from approximately 5,500 to 9,500 feet, depending upon aspect. It is very common for dry mixed-conifer forest types to occupy the north-facing slopes, and ponderosa pine forests the south-facing slopes at the lower elevations of the range. At the upper elevations

of the range, this is often reversed, with dry mixed-conifer forests occupying south slopes, while wetter mixed conifer types are found on the north-facing slopes. Dry mixed-conifer forests are dominated by mainly shade intolerant trees such as ponderosa pine, southwestern white pine, limber pine, quaking aspen, and Gambel oak, with a lesser presence of shade tolerant species such as white fir and blue spruce. Mid-tolerant species such as Douglas-fir are common. Aspen may occur as individual trees or small groups, but typically does not form a seral forest cover type. This forest vegetation community typically occurs with open grass-forb-shrub interspaces.

Landscape-scale conditions (10,000 + acres)

At the landscape scale, the dry mixed-conifer vegetation community is a mosaic of forest conditions composed of structural stages ranging from young to old trees. Forest appearance is variable but generally uneven-aged and open; occasional patches of even-aged structure are present. The forest arrangement is in small clumps and groups of trees interspersed within variably-sized open grass-forb-shrub interspaces similar to historic patterns. Openings typically range from 10 percent in more productive sites to 50 percent in the less productive sites. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. Where they naturally occur, groups of aspen and all structural stages of oak are present. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old

growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

The dry mixed-conifer forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (>3 inch diameter), all well-distributed throughout the landscape. Snags are typically 18 inches or greater at DBH and average 3 per acre. Downed logs (>12 inch diameter at mid-point, >8 feet long) average 3 per acre within the forested area of the landscape. Coarse woody debris, including downed logs, ranges from 8 to 16 tons per acre.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, severity of disturbances, and to climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, and wind), including snags, downed logs, and old trees. Grasses, forbs, shrubs, needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Frequent, low severity fires (Fire Regime I) are characteristic, including throughout goshawk home ranges. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-scale conditions (100 -1,000 acres)

At the mid-scale the dry mixed conifer forest vegetation community is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site

productivity. The more biologically productive sites contain more trees per group and more groups per area. Openings typically range from 10 percent in more productive sites to 50 percent in the less productive sites. Tree density within forested areas generally ranges from 40 to 125 square foot basal area per acre.

The mosaic of tree groups generally comprises an uneven-aged forest with all age classes and structural stages. Occasionally small patches (generally less than 50 acres) of even-aged forest structure are present. Disturbances sustain the overall age and structural distribution.

Fires burn primarily on the forest floor and do not spread between tree groups as crown fire.

Fine-scale conditions (< 10 acres)

Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Openings surrounding tree groups are variably-shaped and comprised of open grass-forb-shrub interspaces. Some openings contain individual trees or snags. Trees within groups are of similar or variable ages and one or more species. Size of tree groups typically is less than 0.25 acre, but occasional patches may be 1 acre or greater). Groups at the mid-age to old stages consist of 2 to 70+ trees per group. A spectrum of group sizes is desired. Where the understory plant composition is dominated by grasses and forbs, fire severity is lesser and tree groups are smaller in size. Where the understory plant composition is dominated by shrubs, fire severity is greater and tree groups are larger in size.

Wet (Infrequent Fire) Mixed Conifer Forests

General Description

The Wet Mixed Conifer forest vegetation community generally occurs at elevations ranging from approximately 5,500 to 10,000 feet. Tree species composition varies depending on seral stage, elevation, and moisture availability. It can be composed of early and mid-seral species such as aspen, Douglas fir, New Mexico locust, southwestern white pine and limber pine, and late seral species such as maple, white fir and blue spruce. Ponderosa pine may be present in minor proportions. The absence of Engelmann spruce and/or corkbark fir distinguishes wet mixed conifer from the spruce-fir forest. Disturbances in typically occur at two temporal and spatial scales; large scale infrequent disturbances (mostly fire) and small scale frequent disturbances (fire, insect, disease, wind). This forest has an understory of a wide variety of shrubs grasses, and forbs depending on soil type, aspect, elevation, disturbance, and other factors.

Landscape Scale Desired Conditions:

The Wet Mixed Conifer forest vegetation community is a mosaic of structural and seral stages ranging from young trees through old. The landscape arrangement is an assemblage of variably-sized and aged groups and patches of trees and other vegetation associations similar to historic patterns. Tree groups and patches are comprised of variable species composition depending on forest seral stages. An approximate balance of seral stages is present across the landscape, each seral stage characterized by distinct dominant species composition and

biophysical conditions. Old growth is well-distributed in the landscape. Canopies are generally more closed than in dry mixed conifer. An understory consisting of native grass, forbs, and/or shrubs is present.

The Wet Mixed Conifer forest vegetation community is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris, all well-distributed throughout the landscape. Number of snags and the amount of downed logs (>12 inch diameter at mid-point, >8 feet long) and coarse woody debris (>3 inch diameter) vary by seral stage.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, wind, and fire), including snags, downed logs, and old trees. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Mixed severity fire (Fire Regime III) is characteristic. High severity fires (Fire Regime IV & V) rarely occur. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale Desired Conditions:

At the mid-scale, the size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are frequently

in the hundreds of acres, with rare disturbances in the thousands of acres. Groups and patches of tens of acres or less are relatively common. A mosaic of groups and patches of trees, primarily even-aged, and variable in size, species composition, and age is present. Grass, forb, shrub openings created by disturbance, may comprise 10 to 100 percent of the mid-scale area depending on the disturbances and on time since disturbance. Aspen is occasionally present in large patches.

Density ranges from 20 to 180 square foot basal area per acre depending upon time since disturbance and seral stages of groups and patches. Snags 18 inches or greater at DBH range from 1 to 5 snags per acre, with the lower range of snags of this size associated with early seral stages and the upper range associated with late seral stages. Snag density in general (>8 inches DBH) averages 20 per acre. Coarse woody debris, including downed logs, vary by seral stage, with averages ranging from 5 to 20 tons per acre for early-seral stages; 20 to 40 tons per acre for mid-seral stages; and 35 tons per acre or greater for late-seral stages.

Mixed (Fire Regime III) and high (Fire Regime IV) severity fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. High severity fires generally do not exceed 1000 acre patches of mortality. Other smaller disturbances occur more frequently.

Forests in the wildland urban interface (WUI)¹ are dominated by early-seral fire-adapted species growing in an overall more open condition than the general forest. These conditions result in fires that burn primarily on the forest floor and rarely spread as crown fire.

Fine Scale Desired Conditions:

In mid-aged and older forests trees are typically variably-spaced with crowns interlocking (grouped and clumped trees) or nearly interlocking. Trees within groups can be of similar or variable species and ages. Small openings (gaps) are present as a result of disturbances.

Spruce-fir Forests

The Spruce-fir Forest vegetation community generally occurs at elevations ranging from approximately 9,500 to 11,500 feet. It is often dominated by Engelmann spruce, but contains other species depending on elevation. The understory commonly includes currants, maples, honeysuckle, common juniper, huckleberry, alpine clover, and sedges. Spruce-fir forests occur on the coldest, wettest, and highest elevation sites in the Region. This forest vegetation community can be subdivided into lower elevation (spruce fir mix) and upper elevation (subalpine spruce fir) spruce-fir types with differing fire regimes and subdominant species composition. The lower spruce-fir type typically occurs between 9,500 and 10,500 feet in elevation, while the upper spruce-fir type typically occurs between 10,500 and about 11,500 feet in elevation and is bounded, where present, by the alpine tundra vegetation above 11,500 feet.

The lower elevation spruce-fir type resembles the wet mixed conifer except with a different composition of tree species, due to colder and wetter conditions, and is a transition zone

¹ Note – each Forest needs to provide here the definition for WUI that they are using.

between wet mixed conifer and the upper elevation spruce-fir forest type. In the lower type, the common seral tree species are aspen, Douglas-fir, white fir, and Southwestern white/limber pine. The climax forest is dominated by Engelmann spruce, white fir and occasionally blue spruce. Subdominant species may include corkbark/subalpine fir, white fir, and bristlecone pine. In the upper type, the dominant tree species are Engelmann spruce and corkbark fir (subalpine fir). Patches of aspen are occasionally present, but are usually absent. Disturbances in these types typically occur at two temporal and spatial scales; large-scale infrequent disturbances (mostly fire) and small-scale frequent disturbances (fire, insect, disease, wind).

Landscape Scale Desired Conditions:

The Spruce-fir Forest vegetation community is a mosaic of structural and seral stages ranging from young trees through old and is composed of multiple species. The landscape arrangement is an assemblage of variably-sized and aged groups and patches of trees and other vegetation similar to historic patterns. “Old growth” is well-distributed in the landscape. Tree canopies are generally more closed than in mixed conifer. An understory consisting of native grass, forbs, and/or shrubs is present.

The Spruce-fir Forest vegetation community is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris, all well-distributed throughout the landscape. The number of snags and amount of downed logs (>12 inch diameter at mid-point, >8 feet long) and coarse woody debris (>3 inch diameter) vary by seral stage.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, and wind), including old trees, downed logs, and snags. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. In the lower spruce-fir type, mixed severity fires (Fire Regime III) infrequently occur. In the upper spruce-fir type, high severity fires (Fire Regime IV and V) occur very infrequently. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale Desired Conditions:

At the mid-scale, the size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are mostly in the hundreds of acres, with rare disturbances in the thousands of acres. There may be frequent small disturbances resulting in groups and patches of tens of acres or less. A mosaic of groups and patches of trees, primarily even-aged, that are variable in size, species composition, and age is present. Grass, forb, shrub openings created by disturbance may comprise 10 to 100 percent of the mid-scale area following major disturbance and depending on time since disturbance. Aspen is occasionally present in large patches.

Density ranges from 20 to 250 square foot basal area per acre, depending upon disturbance and seral stages of the groups and patches. Snags 18 inches or greater at DBH range

from 1 to 3 snags per acre, with the lower range of snags this size associated with early seral stages and the upper range associated with late seral stages. Snags density in general (> 8" DBH) averages 20 per acre with a range of 13 to 30. Coarse woody debris, including downed logs, averages vary by seral stage, ranging from 5 to 20 tons per acre for early-seral stages; 20 to 40 tons per acre for mid-seral stages; and 80 tons per acre or greater for late-seral stages.

Mixed (Fire Regime III) and high (Fire Regime IV and V) severity fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

The wildland urban interface (WUI)² is comprised primarily of grass/forb/shrub vegetation. Structures in the WUI are surrounded by grassy openings with very few or no trees. These conditions result in ground fires.

Fine Scale Desired Conditions:

Mid-aged to old trees grow tightly together with interlocking crowns. Trees are generally of the same height and age in early group\patch development but may be multilayered in late development. Small openings (gaps) are present as a result of disturbances.

² Note – each Forest needs to provide here the definition for WUI that they are using.

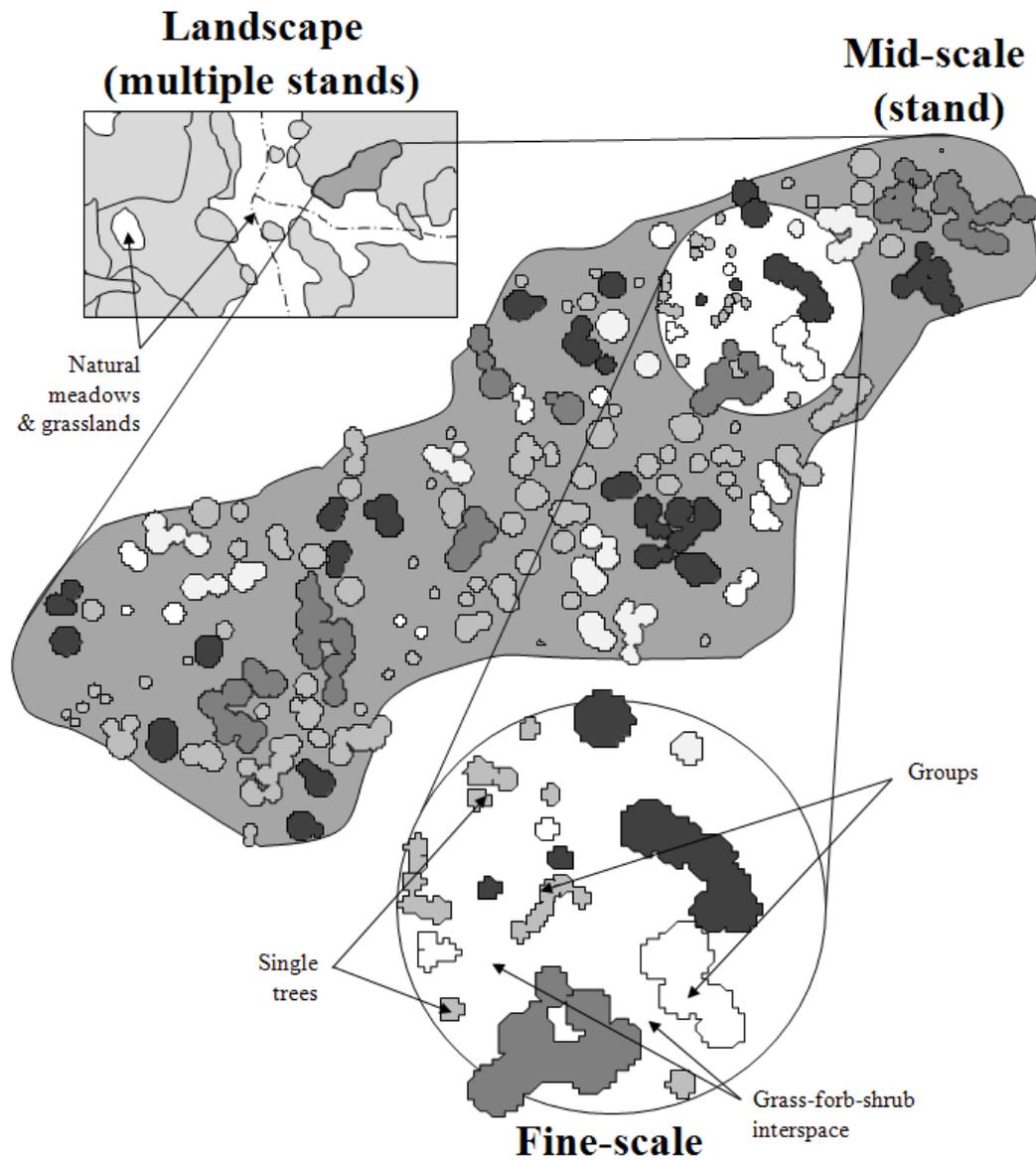


Figure 1. Conceptualized forest reference conditions at three spatial scales. The landscape-scale illustrates multiple stands and natural meadows and grasslands. The mid- and fine-scales illustrate open grass-forb-shrub interspaces and uneven-aged stand conditions consisting of single and grouped trees of different vegetation structural stages, young to old, represented by different shades and sizes.