COOPERS ROCK STATE FOREST
FORKS OF SCOTT RUN – PISGAH PROJECT
SILVICULTURAL PRESCRIPTION & OVERVIEW FOR MULTIPLE USE MANAGEMENT

HISTORY & LOCATION:

The proposed Forks of Scott Run / Pisgah Project (FSRPP) area covered by this prescription is located within the main body of Coopers Rock State Forest (CRSF), south of Interstate 68, east of the Scott Run trail and west of the Pisgah Road (Preston Co. Route 73/2) in Management Compartment VIII. All of the Project area lies within Preston County. The total size of the Project area is 375 acres. Elevations range from about 1,920 feet above sea level in the south to about 2,280 feet above sea level in the north. The Project area will be divided into two separate compartments (north & south) for timber sale purposes. The first, Compartment 1 (North), will encompass the northern and western sections of the Project area and the second, Compartment 2 (South), will make up the rest, essentially the eastern and southern areas of the Project *(see Compartment Location Map)*. Included in this Project will be approximately 53 acres of regeneration or variable retention harvest treatments (about 14% of total Project area). Approximately 10 acres will be two-cut shelterwood treatments and approximately 8 acres will be oak savannah development. Physical features within or near to the Project area include both the main stem & left Fork of Scott Run, Interstate 68, several unnamed tributaries of Scott Run, private residences on the eastern side of the Project and the Pisgah water tower. No official trails or frequently used service roads are contained within the Project area.

As far as can be determined, no timber harvesting (sponsored by the State) has taken place in the Project area since the State took ownership of the property in 1936. Anecdotal evidence suggests that some timber harvesting took place after 1936 due to timber leases being honored that began prior to State ownership. Essentially the entire Project area was harvested in the 1930's. The remnants of two portable sawmill sites (witnessed today by large sawdust piles) are contained within the Project area. Also evident are bridge abutments and numerous skid and haul roads (used to access the timber and remove the lumber). Other evidence suggests industrial use of the area dating back to the Iron Making era of the 1840's and selective cutting era of the late 1800's.

OBJECTIVES:

Three main objectives exist for pursuing the FSRPP, recreational, silvicultural & wildlife related. Currently, there is no dedicated access to the section of CRSF near the Pisgah Road. There is no designated parking area or official access from the eastern side of CRSF. Most of the property bordering the Forest on the Pisgah road side is private. The eastern side of CRSF, South of Interstate 68, is only accessible by off-trail excursions starting along the Pisgah Road (questionably legal parking) or by starting from the parking areas along the Main Forest Road, hiking on official trails, then "bushwhacking". This essentially cuts off access to this part of the Forest for a great deal of the general public and, at times, leads to overcrowding in other areas of the Forest. By installing an official parking area with Pisgah road access and reclaiming skid and haul roads to usable road/trails, many more individuals from the general public will be able

to recreate in this area of CRSF, which has been effectively cut off from public use since 1936. Potential recreational use of the FSRPP would include: hiking, biking, hunting, wildlife viewing/bird watching, rock climbing/bouldering, geo caching etc. Plans for road/trails include a 2.4 mile loop.

Wildlife objectives include stimulating oak regeneration, increasing the hickory component of the forest, increasing mast production, browse and cover and creating habitat diversity by; creating young forest habitat, increasing forest age diversity and vegetative structure, creating linear wildlife openings and savannahs. In general, these goals will create better forest conditions for game and non-game wildlife. Creating disturbance and edge for declining species such as the Golden-winged warbler is also an objective. Oaks are very important wildlife trees, mainly for their hard mast production. With the lack of forest age diversity on CRSF south of I-68, acorns are an extremely important wildlife food. Their continued presence in the Forest hinges on maintaining good conditions for their regeneration.

The lack of forest age diversity will be addressed in the Project area by the inclusion of approximately 63 acres of regeneration, variable retention and shelterwood harvests. These silvicultural treatments will help to meet the WVDNR, Wildlife Resources Section's goal of creating and maintaining 20% of CRSF, south of I-68, in early successional habitat. An approximately 8 acre oak savannah is also planned for the Project area, which will provide additional diversification of wildlife habitat.

Silvicultural objectives include reducing current and future red maple and black gum components, increasing oak components, removing poor quality/diseased/damaged trees and harvesting approximately 1.2 million board feet of usable logs for use by local companies. Additional silvicultural objectives include harvesting mature & over-mature trees, creating age diversity and improving overall timber quality, regenerating high quality, shade intolerant hardwoods, encouraging tree regeneration of selected species, and improving forest health by creating conditions for more vigorous tree growth.

Data from the 1999-2000 timber inventory shows that approximately 41.5% of the pole-sized timber in Compartment 8 is comprised of red maple stems (based on Trees per Acre calculations, see chart in Appendix). It further shows that red maple, black gum and black birch all together make up approximately 51% of the pole-sized timber. For comparison, red maple only comprises approximately 19% of the sawtimber-sized stems. Maple is by far the dominate species in this size class and is poised to replace the current oak and yellow poplar dominated stands (approximately 63% sawtimber-sized composition combined).

Red maple is a moderate to moderately-high shade tolerant species. This means that it can persist in the understory until space in the canopy opens up and it begins to rapidly grow and fill in the gaps. Red maple dominated stands are a growing concern across the mid-Atlantic area of the United States because it is not a particularly important tree in terms of its benefit to wildlife (i.e. mast) and it is replacing the oaks which are beneficial to wildlife. Originally relegated to wet areas due to its low tolerance of fire, red maple has greatly increased its range over the last 50-60 years, mainly due to the absence of fire (natural or man-made) in the ecosystem. On the other hand, northern red oak, which is well adapted to survive and thrive in a periodic surface fire regime, has been declining in percentage of stand composition across the same area, potentially due to similar fire factors *(for a more detailed description of this*

phenomenon, see the USDA General Technical Report NRS-33, Prescribing Regeneration Treatments for Mixed-Oak Forests in the Mid-Atlantic Region).

The 1999-2000 inventory analysis for Compartment 8 also points out a potential regeneration problem with yellow poplar (25.4% sawtimber-sized tree composition vs. 8.3% pole-size tree composition), black cherry (12.2% sawtimber-sized tree composition vs. 3.9% pole-size tree composition) and hickories (less than 1% of sawtimber-sized tree composition). Yellow poplar and black cherry are both shade-intolerant species which need full sunlight to regenerate. Conditions for this are currently lacking on CRSF, south of I-68. Hickory nuts are an important wildlife food and hickory trees need to be maintained and encouraged to regenerate across all stands in the FSRPP.

TIMBER (Current Conditions):

An area of approximately 570 acres in the eastern part of CRSF, south of I-68, was inventoried in the winter of 2010-2011. After careful consideration, approximately 375 acres of this initial 570 acres was chosen for the FSRPP. A 2.5 x 2.5 chain grid understory inventory was completed on the 375 acre FSRPP area in the summer of 2011. This detailed inventory collected information on fern cover and woody plants that cast low shade, interfering with desirable tree seedling development (by species), regeneration (by species), other competing vegetation (by species) and rock and other unique habitat information. Additional information was also collected, such as suitability for harvesting, cover type information, surface water notes and invasive species presence. SILVAH software (Silviculture for Allegheny Hardwoods) threshold levels were used when collecting interfering vegetation and tree regeneration data.

For the purposes of this prescription, the timber was divided into three major timber types, Oak, Cove Hardwoods and Mixed Hardwoods (see Timber Stand Map). The Oak type can be defined by the presence of chestnut oak, white oak, scarlet oak, black oak and red oak. The Cove Hardwood type would include the presence of either or both yellow poplar and black cherry. The Mixed Hardwood type sites contain a mixture of one of the drier site oaks (white, chestnut, or scarlet) along with either black cherry or yellow poplar. Red maple and red oak can be found across all types, although red maple is more prominent in the Cove / Mixed Hardwood types than the Oak type and red oak more prominent on the Oak / Mixed Hardwood types than the Cove type.

The following paragraphs contain specific details about each of the nine stands/sites. The Timber Cruise Summary table (attached) contains additional relevant cruise statistics. All volume estimates are in ¼ Inch International Scale. Total Project standing timber volume (12" DBH and above) amounts to approximately 5,426,133 board feet.

<u>Cove Hardwood Sites:</u>

Two distinct Cove Hardwood Type areas exist on the FSRPP area. Cove Hardwood Stand 1 is located in the west-central part of the Project area, predominately situated on the western side of the central drain. It encompasses approximately 35 acres and has an east / south-east aspect. Slopes range from gentle to moderate with several ephemeral streams evident in the stand. Total basal area amounts to 134.7 feet^2 per acre. Yellow poplar is the predominate species, making up 45.5% of the basal area and 54.7% of the volume. Total Stand

sawtimber volume amounts to 17,136 board feet per acre or approximately 606,435 board feet total. More black cherry sawtimber (by percent of total volume) is contained in this cove hardwood stand vs. Cove Hardwood Stand 2. Good black cherry advanced regeneration is evident in the northern & western areas of the stand. Fern problems exist in the northern half of the stand. Woody interference is present only in a few spots in the southern and south-eastern area. A few areas with large rocks are evident in the central area of the stand and in the extreme south-west area.

Cove Stand 2 is located on the western side of the Left Fork of Scott Run, running its entire north-south length in the Project area. At 88.36 acres, it's the biggest stand in the Project. Generally, the stand has an east or south-east aspect and slopes range from moderate to severe. Several ephemeral streams are evident in the central section of the stand, as well as numerous seeps. Care will be taken when crossing these drains with skid roads. Permanent culvert installation is recommended for main skid roads. Total basal area equals 144.9 feet^2 per acre. Yellow poplar is the dominate species, comprising 61% of the basal area and 71% of the volume. Total stand sawtimber volume amounts to 19,911 board feet/acre or approximately 1,772,906 board feet total. The northern area of this stand contains many large, mature and over-mature yellow poplar trees. Tree mortality due to disease and overcrowding is evident, along with numerous trees showing signs of rot which have been broken by wind or snow. The trees in the southern area of the stand seem healthier. Good advanced black cherry regeneration is evident in several places in the stand, especially in the north-west and central-east sections. Oak regeneration is evident in the central-east and extreme southern areas. Fern essentially covers the entire stand and will inhibit regeneration after overstory harvesting unless it is controlled using cultural measures, such as herbicide applications. Woody interference (red maple, black birch, black gum and woody shrubs) occurs in patches throughout the stand and should be controlled prior to any harvesting. Areas of large rocks exist in the extreme northern, central and extreme southern areas of the stand.

Mixed Hardwood Sites:

Mixed Hardwood Stand 3 is located in the south-central area of the Project on the east side of the central drain and basically surrounds Oak Stand 7. It encompasses 26.87 acres and has a varying aspect, ranging from south-east to south on the eastern side and west to southwest on the western side. Slopes range from near level in the north to severe in the extreme south. Yellow poplar comprises approximately 41% of the stand basal area and 52% of the sawtimber volume. Total stand basal area amount to 125 feet^2 per acre with stand volume equaling 16,256 board feet/acre or 436,797 board feet total. Some good advanced black cherry regeneration exists in the southern section on the south-east aspects with good oak regeneration occurring on the south-west aspects. Fern problems exist in the north-east section with woody interference issues in the north, west and south. Areas of rocks are evident in the southern end of the stand.

The main section of Mixed Hardwood Stand 4 (55.54 acres) is located in the north-west section of the Project, with a small annex (2.14 acres) in the north-central Project area. These two stands were grouped together based on the similarity of the timber. Slopes range from level to moderate with aspects generally north-west to west and south-east. Stand volume equals 13,179 board feet per acre or 756,881 board feet total. Total stand basal area equals 114.5 feet^2 per acre. Yellow poplar comprises 31.3% of total stand volume with oaks (chestnut, red &

white) comprising 29.2%. Red maple and black cherry comprise 22% and 16.3% respectively. Oaks comprise 28.5% of the basal area with red maple at 26.2%, yellow poplar at 24.6% and black cherry at 19%. This is truly a "mixed hardwood" stand. Extremely good advanced black cherry regeneration exists on the central flat and eastern slopes of the stand, as well as a small area extending from the flat down the central western slope. Due to this existing regeneration, a regeneration or variable retention harvest in this area of the stand is advised. Little oak regeneration is evident, other than a small area in the western most section. Fern problems are few, except in the eastern & northern-most areas. Woody interference is limited to the western slopes and is patchy, except for the extreme southwest area where black gum saplings are an issue. Areas of large rocks exist mid-slope on the western side, running north-south though essentially the southern two thirds of the stand.

Mixed Hardwood Stand 5 (16.82 acres) is located along the eastern side of the Left Fork of Scott Run, extending about one-third of the way to the Forest boundary except where it extends up the drain to the boundary in the northern section of the stand. This stand has a west to south-west aspect and slopes are slight to moderate. Total stand basal area amounts to 91.4 feet^2 per acre with an approximate volume of 9,366 board feet per area or 157,168 board feet total. Yellow poplar comprises about 41% of the stand volume with red oak coming in second at about 27%. Chestnut oak comprises about 14% of the stand volume. No fern problems exist within the stand but woody interference is a problem. The entire stand has enough sapling & pole-sized red maple, black gum and black birch in the understory to potentially interfere with desired species regeneration. This woody interference needs to be controlled through cultural work prior to any overstory harvesting. Good advanced oak and black cherry regeneration is generally lacking throughout the stand. Due to the presence of several seeps and ephemeral drains plus areas of large rocks, any skid road development must be carefully planned.

Oak Sites:

Oak Stand 6 is located in the north-central area of the Project, encompassing approximately 55 acres. This stand has fairly gentle slopes with a generally southern aspect. It is located at the top of the ridge and occupies a drier site than the previously mentioned Cove Hardwood and Mixed Hardwood stands. Stand volume amounts to about 12,002 board feet per acre or a total volume of 671,658 board feet. Basal area equals 122 feet^2 per acre. Chestnut oak makes up the highest percentage of total volume at about 36%, with red oak at about 23% and red maple at about 20%. Chestnut oak makes up about 39% of the basal area, which should be reduced in favor of red and white oak, through silvicultural practices. Fern problems exist in the northern area of the stand and woody interference is present in the central and south-west sections. Only a few spots of good black cherry and oak regeneration are present. A few seep areas are evident in the stand and should be protected by buffers.

Oak Stand 7 (20.11 acres) is located on the southern section of the Project area. It encompasses the southern most flat and its southwest facing slopes. Slopes range from near level to moderately steep. Aspects range from southern to westerly. Total basal area amounts to 74.3 feet^2 per acre, the lowest of any stand on the Project area. Sawtimber volume equals approximately 7,871 board feet per acre or 158,278 total. Red oak is the dominate species, making up about 42% of the total sawtimber volume with chestnut oak making up about 25% and scarlet oak comprising 16%. Scarlet oak makes up a greater percentage of species composition in Oak Stand 7 than in any other stand on the Project. A small area of heavy fern

cover exists in the north-east section of the stand and woody interference is present in the southwest. Advanced regeneration is poor across the stand. Rocky areas exist in the southern and southwestern part of the stand. Because of its gentle slopes and oak dominated overstory, DNR, Wildlife Resources Section personnel have requested that an oak savannah be created in the northern and central areas of the stand.

Oak Stand 8 makes up the western area of the Project and is approximately 43 acres in size. Aspects are generally west or south-west and slopes are moderate. Total stand basal area equals 117.5 feet^2 per acre. Stand volume averages 14,041 board feet per acre or 610,223 board feet total. Chestnut oak is by far the dominate species, comprising 44.7% of the sawtimber volume and about 43% of the basal area. Red oak makes up about 22% of the total volume and about 21% of the basal area. This greater than desirable amount of chestnut oak should be reduced in favor of red and white oak. Fern is not a problem in Oak Stand 8, but woody interference is, especially black gum. The large amount of black gum saplings and poles present in the understory needs to be greatly reduced by cultural practices, such as herbicide applications using the hack and squirt method. The extreme southern area of this stand contains very large boulders and an exposed cliff line. These rocky, special habitat areas should be protected by use of buffers. DNR, Wildlife Resources Section personnel have requested a regeneration harvest in the south-central area of the stand where there is a high potential for oak sprout regeneration. This will create early successional oak habitat which, for all practical purposes, is non-existent on CRSF, south of I-68.

Oak Stand 9, approximately 31 acres, is located in the extreme north-east and eastern sections of the Project area, directly adjacent to the eastern Forest boundary for approximately 2,600 feet. Aspects range from the south-west in the north to west in the central and southern areas. Slopes are generally moderate. Stand basal area totals 86.7 feet^2 per acre. Sawtimber volume amounts to 8,839 board feet per acre or 282,577 board feet total. Red oak comprises about 34% of the total sawtimber volume with chestnut oak at about 25%. Each species makes up about 29% of the basal area. Fern cover is not a problem in Oak Stand 9 but woody interference is, consisting of mainly red maple and black gum. Herbicide treatments to this sapling and pole-sized woody interference are recommended prior to any overstory harvesting. Several areas of large rocks & boulders exist within the stand. Careful planning of skid road locations is necessary to avoid and protect these rocky areas. Because this stand borders the Forest boundary, a no-cut buffer of 50 feet and an additional light-selection buffer of 100 feet should be applied, especially where private residences are directly adjacent to the Forest boundary.

TIMBER (Specific Prescriptions):

General prescription items which will be included for all stands are the retention of all active den trees and from three to five snags per acre. Streams will be protected by buffers and West Virginia streamside management zone Best Management Practices (BMP) guidelines will be followed. A conditioning, or improvement cut is a harvest prescription that is used to improve the overall health of the stand by removing mature, over mature, low vigor and poor quality trees. The result is a stand with better stocking, more vigorous and desirable tree species, increased diversity, timber quality and growth potential. Definitions of different silvicultural practices mentioned in the stand prescriptions are contained in the Appendix material. Overall, the following silvicultural prescriptions will serve to further the Project objectives of reducing the

red maple component, promoting oak, regenerating mature stands of shade intolerant species and producing wood products for the local economy.

Compartment 1 (North)

The first timber sale on this Project will encompass Compartment 1 (North). This compartment contains approximately 173.5 acres and has a standing timber volume of 2,544,976 board feet International ¼" Scale. A minimum of 600,000 board feet will be harvested from this Compartment.

Cove Hardwood Stand 1 N (8.55 acres) – Proposed silvicultural treatments to this Cove stand will include a Conditioning Cut, concentrating on harvesting mature yellow poplar, black cherry and red maple. A small section in the western area with good black cherry regeneration may be included with the regeneration or variable retention harvest plans in Mixed Hardwood Stand 4 N. In general, the basal area should be reduced to concentrate growth on high quality crop trees. Poor formed, diseased and undesirable species, such as red maple should be removed and good quality crop trees in the 12 to 18 inch DBH range, especially black cherry and red oak, should be retained. A light selection buffer of 50 feet should be left along the intermittent stream contained within the stand in addition to the WV Streamside Management Zone BMP guidelines.

Cove Hardwood Stand 2 N (38.81 acres) – Proposed silvicultural treatments to this cove stand include an approximately 15 acre regeneration harvest with residual oak and potentially other species, such as black cherry (See Prescription Summary Map for location). Another name for this practice is a variable retention harvest. The main purpose of this prescription will be to regenerate yellow poplar and black cherry. The areas of this Stand outside the planned regeneration harvest area will be marked using a group selection method. The group selection method is particularly relevant in this stand, especially in the northern areas where groups of mature and over-mature yellow poplar trees exist. Overall basal area should be reduced favoring the oaks, especially red oak, present in the stand. Poor quality black cherry stems should be removed. The majority of timber volume to be removed from this stand should be made up of yellow poplar, red maple and black cherry. Below the lower secondary skid road, single tree / light selection harvesting will be implemented. A minimum 25 foot no-cut buffer strip and an additional 25 foot light selection buffer will be left along the Left Fork of Scott Run and WV Streamside Management Zone BMP guidelines will be adhered to. The heavy cover of fern present across essentially the entire stand needs to be controlled through herbicide applications prior to harvest.

Mixed Hardwood Stand 3 N (3.71 acres) – The majority of this stand is situated in Compartment 2 (South). The small area included in Compartment 1 (North) should receive a conditioning cut, harvesting primarily mature and poorly formed or low quality yellow poplar, red maple and chestnut oak trees. Good quality red oak stems should be released using the Crop Tree method. A small area in the eastern section of the stand may be included in the two-cut shelterwood treatment described in the narrative for Oak Stand 6 N.

Mixed Hardwood Stand 4 N (48.61 acres) – An approximately 19 acre area of this stand situated on the flat and gently sloping ridge top areas where extremely good advanced black cherry regeneration exists will receive a regeneration or variable retention harvest prescription (see attached Prescription Summary Map). Good quality red oak stems should be retained in

this area. Over the rest of the stand, a general Conditioning Cut prescription is recommended. The red maple component should be reduced and red oak crop trees released. The poor quality / diseased black cherry should be removed. In the yellow poplar dominated areas, a thinning from below and the crop tree release method of marking should be used. The few hickory trees that are present should be retained and released. Areas of this stand containing few mature trees may be left intact for harvesting at a future time. When constructing the skid road, mature, damaged or low quality stems should be harvested but hopefully this can be kept to a minimum to maintain a residual canopy cover over the road for aesthetic (recreational) purposes.

Oak Stand 6 N (55.21 acres) – This Stand is fully contained within Compartment 1 (North). The south-east section of the stand contains some good advanced oak regeneration. This area has the potential for a two-cut shelterwood harvest. Additional field work will need to be performed to definitively delineate the area of the shelterwood treatment prescription. Approximately 1.5 acres in the northeastern area of the Stand will be included with the regeneration or variable retention harvest plans as stated in the Cove Hardwood Stand 2 N narrative. The remainder of the stand should receive an improvement or conditioning cut to enhance future timber values and wildlife benefits. The red maple and chestnut oak component should be reduced and red and white oak should be favored. Poor quality and diseased red maple and black gum should be removed through harvesting, but cultural work should be performed in the form of hack and squirt herbicide treatments to stems less than six inches in diameter to prevent stump sprouting. Sections of this stand which are healthy may be left undisturbed for future treatments and aesthetic purposes.

Oak Stand 8 N (18.67 acres) – Specific objectives include reducing the red maple and chestnut oak component and releasing higher quality red and white oak trees. An improvement or conditioning cut should be applied across the stand, concentrating on removing mature and poor quality or diseased red maple and chestnut oak in favor of red and white oak. Areas of the stand may be left intact for future treatments and aesthetic reasons. Group and single tree selection methods may be used, depending on specific stand area characteristics. Low woody interference is a major issue in the southern two-thirds of the stand and cultural work needs to be performed to reduce the amount of pole-sized black gum & red maple prior to harvesting.

Compartment 2 (South)

The second timber sale on the FSRPP will encompass Compartment 2 (South). This compartment contains approximately 201.5 acres and has a standing timber volume of approximately 2,881,076 board feet International ¼" Scale. A minimum of 600,000 board feet will be harvested from this Compartment.

Cove Hardwood Stand 1 S (26.84 acres) – Approximately 7 acres of the north-western section of this stand with good black cherry regeneration will be included with the regeneration or variable retention harvest plans as stated in the Mixed Hardwood Stand 4 N narrative. Plans for the remaining approximate 20 acres include a conditioning cut to harvest mature yellow poplar, red maple and black cherry while removing poor quality stems of all species. Poor quality red maple, chestnut oak and yellow poplar should be removed in favor of good quality red oak. The extreme southern area of the stand has access issues which may dictate leaving the area undisturbed. Heavy fern cover exists in the north and north-eastern sections of this stand and should be reduced through herbicide applications prior to harvesting.

Cove Hardwood Stand 2 S (49.56 acres) – For prescription purposes, this stand will be divided into two areas, one north or west (upslope) of the primary skid road and the other east or south (down-slope) of the road. The timber on the upslope side seems to be more mature and contains larger trees than the down-slope area. A conditioning cut is prescribed for the entire stand. Mature yellow poplar, red maple and black cherry trees should be harvested, along with poor quality and diseased trees of any species, but especially red maple and yellow poplar. Good quality growing stock red oak should be retained and released. The group selection method should be used when marking in this area. Treatments in the down-slope section of the stand should be more single-tree selection oriented with areas left intact for future harvest and stream protection purposes. Marking schemes should include thinning from below and using crop tree release methods. Good quality red oak, yellow poplar and black cherry stems should be favored. Red maple stems should be reduced. A stream buffer will be implemented as stated in the Cove Hardwood Stand 2 N narrative. Fern problems are evident, mainly on the upslope portions of the stand and need to be treated prior to harvest.

Mixed Hardwood Stand 3 S (23.16 acres) – The bulk of this stand exists in Compartment 2 (South). A few acres in the north-east section may be incorporated into the savannah area. Silvicultural treatments to this stand will include a conditioning cut with the majority of harvestable volume made up of yellow poplar, red maple and chestnut oak. The red maple component needs to be reduced. Red oak should be retained and released. Based on the good advanced oak regeneration found in the southern area of this stand, this area may lend itself to a two-cut shelterwood treatment. Additional field work is needed to delineate the area and fully determine if a shelterwood treatment is warranted. A buffer should be utilized in the western sections bordering the intermittent stream. WV Streamside Management Zone BMP guidelines will also be followed. Timber in the rocky areas of the stand may be left untouched for special habitat reasons. Fern cover exists in the north-east section of the stand and cultural work is needed. Woody interference is present in the west and south of the stand and should be controlled prior to harvesting.

Mixed Hardwood Stand 4 S (9.07 acres) – The majority of this stand is contained in Compartment 1 (North). Of the remaining 9 acres in Compartment 2 (South), approximately 4 acres will receive a regeneration or variable retention treatment as stated in the Mixed Hardwood Stand 4 N narrative (see Prescription Summary Map). The remaining acres should receive a conditioning cut treatment, concentrating on harvesting mature yellow poplar, cherry and maple and overall reducing the red maple component. Poor quality red maple, chestnut oak and yellow poplar should be removed. Red oak and hickory should be retained and released. Areas of the stand with large rocks and boulders should be left undisturbed. Woody interference is a problem, especially sapling and pole black gum. Cultural treatments should be implemented prior to harvesting.

Mixed Hardwood Stand 5 S (16.82 acres) – This stand contains the least standing timber volume of any stand on the Project. Some mature trees are present, but the majority of the area contains small sawtimber-sized trees. Because of this, harvesting treatments will emphasize improving the quality of the red oak for future wood products and mast production. An improvement cut is prescribed using a thinning from below scheme with a single-tree selection method. A no-cut buffer of a minimum of 25 feet with an additional light-selection buffer will be employed along the Left Fork of Scott Run. Wet and rocky areas of the stand may be left

undisturbed for habitat and aesthetic reasons, allowing them to grow for potential future treatment. Understory black gum is a major problem in this stand and cultural treatments should be undertaken.

Oak Stand 7 S (20.11 acres) – Approximately 6 acres of this stand will be developed into an oak savannah (See Prescription Summary Map). The other areas will receive an improvement cut, concentrating on removing poor quality chestnut oak, scarlet oak and red maple. Red and white oak should be favored, retained and released. Due to the rockiness of the south-central area of the stand, this area may be left undisturbed. The western sloping areas of the stand have woody interference problems and if timber is marked in this area, cultural treatments should be implemented to control the sapling and pole-sized black gum and red maple.

Oak Stand 8 S (24.77 acres) – An approximately 8 acre regeneration harvest has been prescribed for the gently sloping upland portions of this stand in consultation with the WVDNR Wildlife Resources Section. This treatment should produce oak early successional habitat, a habitat type virtually non-existent on CRSF, south of Interstate 68. It is anticipated that the oak will regenerate through stump sprouting and produce a high density stem condition. A selective harvest may take place in the north-western area of the stand and marking should consist of harvesting mature oaks, especially chestnut and black oak, while retaining and releasing good quality growing stock red and white oaks. The red maple component should be reduced though removal of mature and poor quality or diseased trees. An area of rocky outcrops with some large boulders and small cave-like structures exists below the main loop skid road, off the point in the south-central area of the stand. Due to the unique nature of this habitat, a no-cut buffer should be implemented surrounding this area. Potential access problems also exist in the extreme southern area of the stand which may preclude any harvesting in that area. The entire stand has sapling and pole-sized black gum woody interference in the understory, which needs to be controlled through herbicide applications.

Oak Stand 9 S (31.08 acres) – An improvement cut is prescribed for this oak stand. Emphasis should be placed on reducing the chestnut oak composition in favor of white and red oak. Mature and poor quality chestnut oak should be harvested. The red maple component of the stand should be reduced by harvesting mature, poor quality or diseased stems. Some mature red oak may be harvested but the bulk of the small sawtimber-sized, good growing stock should be retained and released. Most of the stand has black gum woody interference problems and should be treated with herbicides. Some rocky areas with large boulders are evident in the northern and central areas of the stand and may be left undisturbed.

CULTURAL TREATMENTS:

Two main cultural treatments are needed on the FSRPP, fern control and low woody interference control. Heavy fern coverage is most evident on the east and southeast facing slopes on the west side of the Left Fork of Scott Run, essentially covering the entire area of Cove Stand 2. Other areas of heavy fern cover are located in the extreme north-central upland area and at the head and west side of the centrally located intermittent drain (see Fern Coverage Map). Heavy fern cover has been proven to deter tree regeneration. Prior to any harvesting, especially regeneration or variable retention harvest sites and areas marked using the group selection method where the silvicultural intent is to regenerate stands, the fern should

be treated with herbicides to reduce its presence. Any use of herbicides for fern treatments will adhere to standard, accepted forestry protocol.

Essentially the entire Project area, with the exception of the western uplands on the west side of the central intermittent drain in Cove Stand 1 and Mixed Hardwood Stand 4 and south-eastern upslopes of southern Cove Stand 2, has low woody interference problems (see Woody Interference Map). Sapling and pole-sized black gum and red maple make up the majority of the problem, with black birch in a few areas. Since it is not economically feasible to treat the entire Project area, additional field work will be needed to identify and delineate areas where the current silvicultural intent is to regenerate trees. Cultural treatments to the woody interference should be concentrated in these areas. Treatments may include the application of herbicides though the "hack and squirt" method. Any use of herbicides for control of woody interference should adhere to standard, accepted forestry protocol.

SOILS:

Four major types of soils are found in the Project area. These include Dekalb channery sandy loam (rubbly) (313.47 acres, 83.6% of total Project area) *(components include DeC & DeE)*, Ernest silt loam (extremely stony)(60.5 acres, 16.1% of total Project area)*(EsC)*, Dekalb loam (.11 acres, less than 1% of total Project area)*(DkD),* and Clymer Loam (0.88 acres, less than 1% of total Project area)*(CmB)*. An extremely small area (0.03 acres) of Udorthents soil (fill material, *Ud*) exists where the Left Fork of Scott Run emanates from a culvert under I-68 in the northern area of the Project. This soil is the result of the construction of I-68. Because the Delkalb loam, Clymer loam and Udorthents components make up such a small portion of the soils on the Project area, they will receive no further mention. Please see the included FSRPP Soils map for specific soil locations.

The Dekalb channery sandy loams (rubbly) are well drained soils found on mountain slopes. The parent material consists of acid residue weathered from sandstone. Depth to a root restrictive layer, bedrock, is 20 to 40 inches. Soil shrink-swell potential is low. Forestland productivity is moderate with a site index for northern red oak of 65. Erosion hazard on roads and trails is moderate to severe. BMPs to alleviate this erosion hazard include not using roads during wet periods unless they have been strengthened with gravel because rut formation is a hazard (especially in the DeE component) and maintaining streamside filter strips, installing water bars and revegetating disturbed areas after they are no longer being used.

The Ernest silt loam (extremely stony) is a moderately well drained soil found on drainageways on hills & drainhead complexes on hills. The parent material consists of acid colluvium derived from sandstone and shale. Depth to a root restrictive layer (fragipan) is 20 to 36 inches. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. A seasonal zone of water saturation is at 16 inches during January, February, March, April & December. Forestland productivity is very high, with a site index of 80 for northern red oak. Erosion hazard on roads and trails is severe, necessitating strict compliance with forestry BMPs. In general, by using Best Management Practices and limiting heavy equipment activity during wet weather, potential soil erosion problems caused from haul road and skid trail use can be avoided.

ROADS & LANDINGS:

Approximately 4 miles of main and secondary skid roads have been flagged and GPS'd throughout the FSRPP, including a 2.4 mile main loop road. The landing area is planned for location in the extreme north-east section of the Project, near the Pisgah Road (CR 73/2). Only a short section of rocked haul road is anticipated to be needed. An existing road leading down the east (south) side of the main drain in Stand 5 will be utilized as much as possible. Another 1.5 miles of secondary skid road will be needed to fully access the timber across the entire Project. (See Prescription Summary Map for planned road and landing locations).

A major stream crossing on the main loop road will need to be installed on the Left Fork of Scott Run (see Project map for location). The chosen area was previously used as a crossing (bridge) during the 1930s, as witnessed by the old bridge abutments still evident at the site. Most likely a large culvert (minimum 40 inches diameter) will be installed at the crossing. A permanent bridge would also serve the purpose but may be economically unfeasible. This will be a permanent stream crossing so careful planning and construction will be necessary. Several other crossings of intermittent and ephemeral streams will also need permanent culvert installations.

Due to the recreational objectives of the Project, both the main loop skid road and the landing area will have planned utilization after timber harvesting is complete. The landing area will serve as a parking lot for access to the eastern side of CRSF. The approximately 2.4 mile main loop road will be kept open and used as a road/trail to access the Forks of Scott Run area. It will be reclaimed to grass and other herbaceous plant cover.

If possible, main skid roads should be roughly constructed prior to timber harvesting. This will allow for settling before heavy equipment usage and provide access for cultural work before timber harvesting begins. It will further allow for proper culvert installations in needed areas.

All haul and skid roads will utilize best management practices compliant with the 1992 Logging and Sediment Control Act. Roads will be reclaimed according to the mandates contained in the 1996 publication, Guidelines for Managing West Virginia's Nine State Forests. Under supervision of the WVDNR, Wildlife Resources Section personnel, where possible and practical, skid roads will be reclaimed as linear wildlife openings. As previously stated, the landing area will be converted to a parking area and as such will have some type of gravel surface.

WATER:

A perennial stream, the Left Fork of Scott Run and several of its intermittent and ephemeral tributaries are contained within the Project area. When working around any stream or water course, timber harvesting operations will adhere to the WV LSCA Streamside Management Zone (SMZ) best management practices. In addition, a no-cut buffer of a minimum of 25 feet will be implemented along the Left Fork of Scott Run. All perennial and intermittent streams will receive a minimum 50 foot light selection harvest buffer. Harvesting equipment will be kept out of filterstrip areas except where skid trails cross the streams.

Riparian areas adjacent to the streams and seeps will only receive a light selection harvest, if any trees are harvested at all. Tree tops will be removed from all stream beds. All skid road stream crossings will utilize culverts and permanent culvert installation will be mandatory for main skid road stream crossings since the main skid trails will be used for future recreational and service access. Specific plans will be developed and utilized for the main skid road stream crossing (large culvert or bridge) of the Left Fork of Scott Run. Due to the amount of smaller streams contained within the Project area, timber harvesting operations may need to be limited to the drier times of the year.

INSECTS AND DISEASE:

Currently, the only known serious insect problem on CRSF is the hemlock woolly adelgid (HWA). Its presence has been documented since late 2006. Control measures have been performed by WV Department of Agriculture personnel since 2007 with mixed results. They have been hampered by the issue of restricted use of imidacloprid containing pesticides near water. The spread of HWA on CRSF is being monitored by WV Department of Agriculture personnel. No hemlock mortality on CRSF has been associated with the HWA to date. Because of the potential for widespread hemlock mortality due to the HWA, no hemlock will be harvested from the Project area unless extreme circumstances dictate otherwise.

The Emerald ash borror (EAB) and the Asian long-horned beetle are two pests that have been documented in or directly adjacent to West Virginia. EAB traps have been set on CRSF with negative results. Both of these pests have the potential to do great damage to trees on CRSF and throughout the State if an infestation occurs. Placing fact sheets in kiosks around CRSF may allow for greater public awareness of the pests and additional eyes to assist with potentially discovering their presence on the Forest and in surrounding areas.

CRSF had an outbreak of gypsy moth in the late 80's and early 90's and aerial spraying was conducted. Since then, gypsy moth populations have remained low but are still present on the Forest. WV Department of Agriculture personnel continue to monitor their populations annually.

WILDLIFE:

The silvicultural treatments outlined in the previous sections will benefit many species of wildlife. By increasing the oak component in areas dominated by red maple, additional hard mast will be produced now and will continue to be produced in the future. Areas prescribed for selective harvesting will allow the residual, high quality trees to expand their crowns, which should translate to healthier trees with better growth and increased mast production. Additionally, due to the increased sunlight, vines (grape, poison ivy, Virginia creeper) and shrubs such as blueberry, huckleberry, deerberry, winterberry, dogwood and spicebush will produce more fruit. All active den trees and 3-5 snags per acre will be retained in the harvest areas.

The inclusion of approximately 63 acres of shelterwood, regeneration and variable retention harvest areas will create early successional habitat, the most limited type of forest habitat on CRSF. This will further serve to increase forest age diversity on CRSF, south of I-68. Essentially the entire Forest, south of I-68, is currently a 70 to 80 year old mature, closed canopy forest. These early successional habitat areas will provide additional cover and food

sources for a variety of wildlife, including the eastern towhee, the chestnut-sided warbler, the golden-winged warbler and the ruffed grouse, all birds preferring younger forests. White-tailed deer will also benefit from the additional food sources provided by this habitat. Given that CRSF is an older deer management area (bucks must have a minimum 14" antler spread to harvest), this is vitally important.

The Regeneration, Variable Retention and Shelterwood harvest areas will be irregular in shape where possible and soft-mast producing trees, such as dogwood and serviceberry should be retained. All active den trees will also be retained. Depending on the site and specific prescription, some larger, mast producing trees (black cherry, red and white oak) may also be retained on these special treatment areas. Well formed, desirable tree species less than six inches DBH may be left in these areas as well. These residual trees provide a "vertical component" which adds layered habitat for birds and small mammals. All existing den trees and 3 to 5 snags per acre should be retained. Deer browsing pressure will be minimized by making the regeneration, variable retention and shelterwood harvest areas as large as practical (one ten acre area vs. two five acre areas), thus increasing interior area. Slash and tree tops are to be left as intact as possible to limit deer browsing and increase escape and nesting cover.

The creation of an approximately 8 acre oak savannah in Oak Stand 7 will provide a unique habitat that will benefit numerous types of wildlife. The development of this oak savannah will consist of selecting superior mast (hard & soft) producing trees and leaving them on the site (approximately 30-40 feet^2 of residual basal area) All other trees, with the exception of soft mast producing shrubs, will be harvested and the area will have stumps removed. Logging slash will be piled or windrowed and left to provide temporary wildlife habitat. After grading and smoothing, the entire area will be seeded with a mix of herbaceous plants selected for their benefit to numerous wildlife species. Additional trees, such as spruce and pine, may be planted to increase tree diversity and provide shelter for wildlife. Herbaceous undergrowth will be maintained by periodic brush-hogging or mowing, requiring tractor access to the area. Oak savannahs are important for wildlife because they provide two different types of habitat on one site (overstory mast producing trees and ground herbaceous cover). They are especially important for turkey broods and are used by a variety of song bird species. Black bear are also documented using savannah areas.

The linear wildlife openings created by reclaiming and seeding roads will benefit wildlife too, especially wild turkey. All roads and disturbed areas will be seeded with a wildlife seed mix to be chosen by the WVDNR Wildlife Resources Section.

The prescribed silvicultural goal of increasing hickory composition throughout the Project area will additionally benefit wildlife. According to the 1999-2000 timber inventory statistics, hickory currently makes up less than 1% of the species composition in Compartment 8. The answer to the mystery of why there is so little hickory on CRSF is unknown. Any increase in overall hickory composition or individual tree health will benefit wildlife in general.

RECREATION AND AESTHETICS:

It is the policy of the WV Division of Forestry to manage Coopers Rock State Forest (and all State Forests) for multiple benefits while ensuring that our management activities do not adversely affect water quality, aesthetics or recreation. Through public involvement, interagency cooperation and the practice of science based silviculture; we satisfy our legislative mandate of providing not only timber and wildlife management, but also numerous recreational opportunities, such as hiking, biking, hunting, wildlife viewing, birding, etc. Once complete, the FSRPP will greatly enhance recreational access and opportunities in the north-eastern area of the main body of CRSF, south of Interstate 68.

The two main recreational inclusions to the FSRPP are a planned parking area along Pisgah Road and an approximately 2.4 mile loop road/trail, which will allow general public access into this area of Forest that currently does not exist. At the present time, no legal parking areas exist anywhere along the eastern edge of CRSF. The parking area will be developed from the planned log landing area in the extreme north-east area of the Project (see Prescription Summary map). A gate will need to be installed on the loop road near the landing and additional barriers developed to restrict illegal motorized vehicle use of the road system. The potential exists for development of a trail to connect the western section of this loop road to the Scott Run Trail, thus expanding the trail system in the Forest and allowing recreational access to a previously difficult-to-access area.

Any wood chunks and butt-offs left at the log landing after harvest operations will need to be removed for use as firewood by the WVDNR Parks & Recreation personnel to sell in the McCollum camping area, incorporated into vehicle barriers or scattered in the woods due to the planned future use of the landing area as a parking lot. The main skid road loop and associated main spur roads will be reclaimed and left open for future recreational and service use (fire control, search & rescue, access for silvicultural treatments and wildlife management, etc.). All culvert installations in these main skid roads will be permanent and will be designed to function well into the future.

Because the FSRPP is located in an area not generally accessible to the public, little if any disruptions will be caused to normal Forest operations. No log trucks or other heavy equipment will be used on the paved roads within the Forest due to the location of the Project. No official trails (or unofficial trails/service roads) will be directly impacted by the Project. Care will be taken to limit visibility of the Project from Interstate 68. The Project should not be visible to anyone standing on the Coopers Rock Overlook, using the picnic area or driving on the paved Forest roads. At its closest point, the western edge of the Project is approximately 500 feet from the Scott Run trail, on the opposite side of Scott Run.

RARE, THREATENED AND ENDANGERED SPECIES:

Two Federally listed species are of concern at CRSF, The Three-Toothed Flat-Spired Land Snail *(Triodopsis platysayoides)* (Cheat snail), which is listed as Threatened and the Indiana Bat *(Myotis sodalist)*, which is listed as Endangered. The FSRPP is not located within the zone of concern around any known hibernacula used by the endangered Indiana bat (*Myotis sodalis*)(zone of concern is a 5-mile-radius circle centered on the cave entrance). The sale area is within potential summer habitat for the Indiana bat and mist net surveys have been conducted

in the past, following the Indiana bat survey protocol required by the US Fish and Wildlife Service. Bat mist-net surveys were performed in late July of 2006 on CRSF. An additional bat survey was conducted on the Scott Run II Project area during 2011. No Indiana bats were caught during either survey. According to current Federal protocol, bat surveys (mist-net or acoustic) are good for five years. Plans have been made to conduct a bat survey on the FSRPP area for the summer of 2012, which would then stay current for five years, covering any harvesting activities for the currently prescribed lifespan of the FSRPP. It is not anticipated that any Indiana bats will show up in the next survey.

On May 19, 2011, WVDNR, Wildlife Resources Section, bio-diversity biologist Susan Olcott accompanied WVDOF personnel on a tour of the FSRPP area to look for potential Cheat snail habitat. No areas were found which would meet the criteria for primary or potential Cheat snail habitat. The USFWS has provided funding to the WVDNR for additional mapping of snail habitat on CRSF. This funding is hoped to provide for the determination and mapping of the remaining Cheat snail habitat on CRSF on the areas above the gorge (south of I-68) and also the habitat along the rim of the gorge itself. Copperhead Consulting, the firm that conducted the first round of Cheat snail habitat mapping at CRSF in 2008, is contracted to do this survey work and will hopefully complete the work by the end of summer 2012.

Because no Cheat snail habitat (potential or primary) exists within the FSRPP area, snail buffer areas will not be needed. Care will be taken when marking timber around unique rocky habitats to protect the habitat itself and the wildlife species that utilize these areas. Light selection or no-cut buffers will be used to maintain shade on these rocky habitats and heavy equipment use will be restricted within the habitat. Roads should not be constructed directly through these areas.

Another species of concern in the proposed timber sale area is the Allegheny woodrat (*Neotoma magister*). Although this species is not currently listed as federally threatened or endangered, populations are declining in the Northeast. This species, like the Cheat snail, inhabits rock outcrops, talus, and caves. The protections described above will serve to protect the Allegheny woodrat and its habitat. In addition, the silvicultural prescriptions designed to promote oaks (*Quercus* spp.), an important food source for the woodrat, will benefit the species. Because the woodrat is active year-round, acorns are an important food which woodrats cache to provide food during the winter. The FSRPP will benefit this species of concern.

A constant vigilance will be maintained for the unexpected sighting of rare plants and wildlife during field work, and if any rare, threatened or endangered species are encountered, proper conservation measures will be taken. This will be accomplished though consultation with biologists from the WVDNR Natural Heritage Program. All WVDOF foresters and WVDNR Wildlife Resources Section personnel involved in the implementation of this prescription are dedicated to the preservation of rare, threatened and endangered species. Additional information about rare, threatened and endangered species on CRSF is contained in the 2006 CRSF Forest Resources Management Plan, beginning on page 16.

INVASIVE PLANT SPECIES:

The only invasive plant species is known to exist within the proposed Project area is Japanese stilt grass *(Microstegium vimineum)*. This invasive plant is evident on several areas of old skid roads on both sides of the Left Fork of Scott Run. Control measures, potentially involving herbicide applications or mechanical means, should be made prior to the start of any timber harvesting operations.

Other invasive plant species present on CRSF, but not known to exist within the Project area include garlic mustard, Japanese barberry, multiflora rose and autumn olive. If any of these or other invasive species are encountered during field work or during timber harvesting operations, the identity and location of the species will be noted and proper control procedures initiated to eradicate (if possible) or control the invasive population.

In order to prevent the introduction of invasive species from off the Forest, the WVDOF has included the following clause in all timber sale contracts: *Prior to moving any off road equipment onto the State Forest, this equipment will be cleaned of seeds, soil, vegetative matter and debris that could contain or hold seeds*. The WVDOF further stipulates that either straw, certified invasive species-free hay or hydro-mulch *(instead of ordinary hay)* must be used for any mulching operations on WV State Forests. This will reduce the chance of an invasive plant species being accidently introduced to State Forests during reclamation operations.

ADJACENT LAND:

Approximately 2600 feet of the FSRPP boundary exists next to private property. According to the information contained in the 1996 WVDOF CRSF Timber Resources Management plan eight private property parcels border CRSF directly adjacent to the Project area. A minimum 50 foot no-cut buffer and an additional 100 foot light selection harvest buffer will be practiced in these areas, except in the area directly surrounding the landing. Adjacent landowners will be notified by letter no later than when the advertisements for the timber bid sale (Compartment 1, North) are posted in the newspaper. Because some of these residences have incorporated areas of State Forest property into their back yards, law enforcement officials may need to be contacted to ensure residents remove their personal belongings from CRSF.