



**Southern Blue Ridge**  
*Restoration Needs Analysis (in North Carolina)*  
January 28, 2014, 9:30-4:00  
46 Haywood Street, Starnes Room, Asheville, NC

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Notes recorded by Marissa Ponder: These notes are a summary of the general comments mentioned by all attendees when asked four questions for each forested system being discussed. Sometimes the discussion did not cover all the components of the question asked.

**ATTENDEES:**

Adam Warwick (*TNC*)  
Ben Prater (*Wild South*)  
Bob Gale (*WNCA*)  
David Ray (*OSI*)  
DJ Gerken (*SELC*)  
Ed Schwartzman (*NHP*)  
Gordon Warburton (*WRC*)  
Hanni Muerdter (*BRF*)  
Heather Luczak (*USFS*)  
Hugh Irwin (*TWS*)  
Jason Rodrigue (*USFS*)  
Josh Kelly (*WNCA*)

Judy Francis (*DENR*)  
Laura LeFleur (*SELC*)  
Kendrick Weeks (*WRC*)  
Margit Bucher (*TNC*)  
Marissa Ponder (*Contractor*)  
Megan Sutton (*TNC*)  
Michael Cheek (*NC FS*)  
Rick Studenmund (*TNC*)  
Ryan Jacobs (*WRC*)  
Sheryl Bryan (*USFS*)  
Tara Keyser (*USFS-SRS*)

**SBR RESTORATION NEEDS ANALYSIS PURPOSE:** To determine the number of acres in need of treatment (and realistic treatment goals) within individual forested systems in order to restore historic/sustainable forest vegetation structure and composition across the North Carolina portion of the Southern Blue Ridge, beginning with the land under US Forest Service ownership.

**MEETING OBJECTIVES:**

- To share with and receive feedback from partners on a Restoration Needs Analysis that is in progress by TNC
- To collect information on restoration priorities and to prioritize the top forested systems in need of restoration
- To develop a realistic goal for restoration of the highest prioritized systems for the next 20 years

**GENERAL COMMENTS RELATING TO ALL FOREST SYSTEMS BEING DISCUSSED:**

- One individual was concerned that the Simon ecozone model does not incorporate all disturbances. Noted that disturbance history does really influence where these systems are based on historical disturbance, suggested coalesce into more similar disturbance types for seral classes and canopy
- A few individuals expressed a desire for the USFS to consider using landscape forecasting models like those that were done in the Cherokee National Forest Restoration Initiative.
- Participants were interested in overarching themes rather than detailed NRV values.

## SHORTLEAF PINE-OAK SYSTEM

### **1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- Several attendants were concerned that the pine bark beetle outbreak during the early 2000's probably affected 40-50% of trees in this ecozone. Many were concerned that the current species composition information obtained using LiDAR may actually have many dead standing trees in the late closed category.
- Additionally several people added that there has been an encroachment of hardwoods into this system that may be falsely categorized as Shortleaf Pine-Oak. Most seemed to agree with this.
- There was some disagreement whether structure is the most important way to identify restoration needs. Others added that structure is the starting point and that species composition or issues with invasive species can be handled at the project level.
- Many agreed that the typical shortleaf system would not have this type of seral and canopy distribution shown however there was concern raised by a few individuals as to whether the NRV model accurately captures the exact desired distribution.

### **2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- Many felt like this system had more questions than answers. However, there was agreement that this system will take a while to restore, definitely more than 20 years and that it is overall highly out of whack.
- The concern over the need for ground truthing this system was raised again by a few individuals.
- All seemed to agree that this system has high potential to generate revenue from timber harvest and that money could be used to fund other restoration efforts.
- All agreed that mechanical and prescribed fire are appropriate treatment methods.
- Regeneration of the early class was of concern to most for the following reasons:
  - Don't see much regenerating in this system
  - Shortleaf is fickle in seed production, there is about a 30 year timeframe on seed life
  - Planting needs to be a big component of getting successful regeneration

### **3. Of the deficit conditions for this system which ones are most important to address?**

- In general all agreed that this systems needs to have the canopy opened up.
- There was some disagreement as to the specifics of moving s classes around because of the concern over species composition especially if the area is hardwood dominated.
- Some more specific suggestions included moving late seral closed to late open and early, and mid closed to mid open.
- Overall most people all agreed there is more of a need to go from late closed to early. Some early seral currently may not be most agreeable structural composition.

### **4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- Many felt it was hard to comment on a specific number because of needing to know actual species composition.
- No actual number was agreed on by the group.

**Megan summarized the group discussion with the following:**

Seems that the data is skewed because it: does not include composition and may include a lot of hardwood species encroaching over time, does not represent pine bark beetle outbreak, and both of these components mean that in reality it may look different on the ground. Also heard interest in trying to see what the right level in NRV value is. People want overarching themes not detailed NRV values. Also in this system themes may be greatly skewed and fire may be the best method of treatment as well as thinning in hardwood stands.

**DRY MESIC OAK HICKORY:**

**1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- Most agreed that this nails the structural concerns and that composition is key in this system
- The discussion over not knowing exact species composition on the ground was raised by several people as there are concerns with:
  - Mesic invaders invading the understory
  - Mesic species being a large component of the late age class
- Several raised the question of if we do active management what will we open it up to?
- The idea that no action in this system is a type of action. Most agreed that if no action is taken (i.e prescribed fire or mechanical treatment) that this system will have a loss of oak and become highly mesic 100 years out.
- The concern for wildlife habitat was raised because having a system of all 80-100 year old trees is a problem for wildlife as the structure is too similar. It was also emphasized that structure is important for wildlife, in addition to composition.
- Some questioned the NRV old growth value because it had old growth open occurring 20x more than closed.
- It was mentioned that the early category is probably lower than this system shows because many of these patches in reality in 2005 were on their way to the mid-seral class. This was emphasized by other individuals as much of the early was created from an old cutting cycle (about 20 years).

**2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- It was mentioned and many agreed that the tools needed to restore this system need to be outside the typical silvicultural toolbox.
  - For example there is a lot that can be done to speed the transition of late closed into old growth open that includes many types of variable density thinning, creation of down woody debris, and using large branch structure to mock old growth conditions in late.
- The need to expand silviculture practices past two age cuts was agreed on by most participants.
- Several participants voiced that there is a need for these changes to take place on a large scale across the forest.
- All agreed that some type of mechanical treatment is needed in late seral closed.
- Many agreed that management within late seral will depend on recruitment on the ground of mesic spp (including maple) as well as oak

**3. Of the deficit conditions for this system which ones are most important to address?**

- Many agreed that there is a large over abundance in late closed.
- Many agreed that late closed is also compositionally out of whack.

- Many feel that much of this system needs to transition to old growth open from late closed.
- A concern was raised that you lose mass production if the only movement is in the older age class
- An individual mentioned that the FIA showed there is a lot of red maple, which agrees with what we see on the ground.
- One individual mentioned that they feel late closed was probably in good condition and could be easily tweaked with other characteristics like fire. There was much disagreement as to whether the composition in reality is good, as some were concerned over the loss of oak 20 years out, with maple and sweet gum coming in.

**4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- All agreed that there is a need to manage these systems for hardwood regeneration before any type of opening of the canopy occurs.
- When the question was posed about whether 10,000 acres is a practical amount to open up, there was hesitancy because treatment would need to occur before opening the canopy which alone would take 10 years. Many felt that this is a lofty and difficult goal to accomplish given the USFS current operating capacity.
- There were many treatments presented and none seemed to receive negative responses which included: mechanical with fire and herbicide treatment.
- Some individuals countered the lack of capacity and felt that no matter how ambitious the goal is now is the time to take action as the opportunity is here now and we need to find where we can get a win and this will help poise the system for a long term success.
- Megan noticed the debate surrounding capacity and posed the following questions: Given finite resources, how would we go about promoting restoration in these systems? For example should all resources go into shortleaf or would we split it across systems?
- Most agreed that shortleaf and dry mesic oak hickory occur next to each other on the landscape and that fire may be a good way to restore both systems at the same time. There are many opportunities to manage these together.
- Several people agreed that these two systems should be a top priority because restoration management practices can be combined in some areas.
- In regards to the logistics of meeting this goal it was proposed by several people that this system, if paired with restoration of shortleaf, could be done at the watershed scale to best address the following:
  - Using an existing road network to harvest timber
  - Selectively cutting some white and black oak, as well as white pine in these two impacted systems
  - Balancing the best places to harvest based on species composition and best places for prescribed fire
  - Creating additional wildlife habitat in the early class
  - Allowing for selecting the poor quality late closed to transition to early and the better quality late closed to be opened up and to age to old growth open

**Megan summarized the group discussion with the following:**

- Focus on late seral closed as the donating class
- Concern expressed with composition in regards to regeneration
- Need this system to be well represented in all age classes

- Strong need to open silvicultural tool box to achieve goals in quicker and/or more effective ways
- Strong thoughts from some that there is a need to emphasize structural issues from wildlife standpoint as well as compositional.
- Some people disagree with the Bps models as they are subjective and the error bars can be wide, as well as the fact that Bps models have a heavy emphasis on fire

### **MESIC OAK HICKORY**

#### **1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- It was mentioned that it is dominated by tulip poplar and that this was not picked up in the ecological departure analysis and should be a priority for restoration.
- This is another example of an all age system in the bps models.
- Many were concerned with the probability that much of the early successional habitat in this ecozone is moving into mid as early goes fast in this system.
- Several raised concerns over the need to know species composition, specifically with red oak and chestnut oak.
- People mentioned that overall this is a very productive system.

#### **2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- There were concerns with how much late closed is located within high graded areas, which could dramatically impact composition.
- One person mentioned that the restoration opportunities are similar to dry mesic oak hickory such that both have a lot of late closed, many agreed.
- Logistically there may be issues with this system being located on slopes and in riparian areas. In general this system is located downslope of cove forests and other systems are above.
- Many agreed that site preparation will be a huge component of restoration since it's on the edge of cove forests with too much poplar and rhododendron present.
- Advanced oak plantings were suggested and several people agreed that this would be a very long, expensive and time consuming commitment.
- Several treatment scenarios were discussed as possible options and people seemed to agree with all of them:
  - Herbicide treatment: This was seen as a good option because it is very difficult to get a prescribed fire hot enough to kill 2 inch maple seedlings let alone ones that have 5" dbh.
  - Post-harvest management to get rid of undesirable saplings will be needed.
- Variable density thinning in late seral closed and continued emphasis on fire with the advantage of variable density thinning being that it diversifies the age class of forest and provides variable light environments.
  - This received cautions from others because there is very little experience with this in southern Appalachians.

#### **3. Of the deficit conditions for this system which ones are most important to address?**

- Everyone agreed that this system parallels the last one; Move some late closed to old growth open and to old growth closed. Others mentioned that some of the donating classes also need to go to earlier classes.
  - Specifically this system provides many good management opportunities as clear cuts have grown up.

- There are good opportunities to increase species diversity in this forested system.
- People would like to see landscape and stand level changes within this system.

**4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- This system has large acreage compared to other systems.
- Many were concerned that it is important to get late closed on tract to transitioning to old growth, and that management might need to be sped up.
- The topic of when we say “open canopy” what level should we open up to was raised.
  - Josh’s models had anything greater than 60% as open, however a few people agreed that to have a range such as 30%, 40%, and 60% when we do management is desirable.
- There was much debate over the feasibility of 10% restoration of the system or 18,000 acres such as:
  - Natural disturbances are very important in this system.
  - USFS currently doesn’t have the capacity to harvest 18,000 acres and would need partner support.
  - Some felt it was awfully scary to take that much for financial reasons.
- Most agreed that 18,000 acres from an ecological stand point made sense.
- Some felt that if we make this level a goal that the support will happen through partnerships.
- It was stressed by several individuals that this system requires a long term commitment to keep moving late into appropriate old growth classes.

**Megan summarized the group discussion with the following:**

- Species composition could be an issue especially because of high grading and the tulip poplar explosion.
- Focus on late seral closed, focus on moving this donating class around, good portion left to go to old growth either closed or open.
- Not sure how much currently is in early seral now because 2005 data could have transitioned to mid closed; there is a need to evaluate this.
- Specifically management should look for stands dominated by tulip poplar with those transitioning to early and good composition to go to old growth.
- Lots of tools for management such as herbicides, burning, and thinning regimes should be utilized.
- Invasive species are important to follow up on.

**HIGH ELEVATION RED OAK**

**1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- This system historically had lots of chestnut, which implies that this system as a whole used to be more open. (Chestnuts needed open canopy conditions like oak in order to regenerate.)
- Someone stated that this is a low confidence Bps model and no one disagreed with that statement.
- This system only has 6% of it in the open category across all classes.
- There were concerns expressed over the loss the northern hardwoods.
- This system in general is located on steep slopes at high elevation.
- Compared to other systems it probably has more old growth because the high slopes prevented harvesting.

- Climate change as a topic was raised when discussing this issue however no one could come to an agreement as to how to address it in this system. Most agreed that baseline monitoring is important and resiliency analysis might be needed. See parking lot issues listed below.

**2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- Prescribed burns were discussed as a group and there were mixed thoughts on whether a substantial amount could be opened from fire alone.
- Some were concerned about the need to have a hot fire to achieve this and the safety risks associated with that.
- Understory composition was another concern in executing burns.
- All agreed that if this system is opened up there is a concern with rhododendron coming in.
- All agreed that prescribed fire is needed in this system, probably quite frequently to keep shrub density down.
- All agreed that red oak regeneration is important, especially with encroachment of rhododendron.
- Several people mentioned and no one seemed to disagree that fire alone will not maintain oak as part of this system, it will make it more competitive but more management is needed.

**3. Of the deficit conditions for this system which ones are most important to address?**

- Several individuals felt early habitat was very important as this system and class provides habitat for golden winged warbler, rock fowl, and grouse.
- All agreed this system was way out of whack and that there is concern.
- There was debate regarding whether this NRV model accurately predicts a suitable level of early successional habitat. A few individuals were concerned because currently this system is not meeting the needs of some wildlife species. No one was able to agree on an exact % of this system that needs to be in early but everyone agreed that 15% could be too high.
  - Several people added that one way to achieve this is to have larger patches of early along ridgelines where natural disturbances contributing to these patches staying in early longer.
- All agreed that looking at late seral is an important class to restore (reduce closed canopy).

**4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- All agreed this is a high input system, and given its natural tendency toward disturbance there is need for more active management.
- It was proposed converting 10% of the system to open (3,800 acres) and the resulting conversation focused more on management feasibility.
- It was mentioned that there are several factors that make this system hard to manage:
  - High elevation, steeper terrain, fuels in cold snowy winters, hard to burn in spring, and gustier winds.
- There seems to be uncertainty with how to reach these goals. USFS is about 2-3 years out regarding some silvicultural research on mesic oaks which would be informative.

**Megan summarized the group discussion with the following:**

- All agreed that there is too much late seral closed
- There is uncertainty as to what the appropriate level of early successional habitat is and it seems that the group agreed that it was too low.
- There is a need for active management in late closed.
- All agreed that natural disturbance could play higher role than in other systems.
- Several people mentioned that even though this system is hard to do restoration in we should not let it temper desire or goal setting.
- Let some late closed just grow and move to old growth closed.
- All agreed that we don't know the impacts from a loss of chestnut.
- There is a need to see how climate change would affect this system and to filter goals through resiliency.
- 10% early successional habitat may not be realistic, but most seemed to agree it was necessary.
- No one wanted to increase that number.

**DRY OAK**

**1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- There is a concern regarding composition because in some forests there may be too much scarlet oaks where you would have other trees, fire would have allowed for more openness.
- All agreed that shrub density is too high, specifically laurel.
- Some individuals were concerned that if there is not an adequate seed source there that this system could easily shift to another. Disturbance history is important in composition.
- It was mentioned that oak regeneration is not a large issue because of stump sprouting.
- It was noted that the closed classes have significantly lower NRV values compared to open levels.
- Composition issues were noted that:
  - There is probably not a problem with hardwoods encroaching
  - Late closed scarlet oaks tend to drop out over time
  - Evergreen shrubs and mountain laurel encroachment affects regeneration

**2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- All agreed this system needs frequent prescribed fire.
  - Many people felt that several burns were needed at a minimum 2 or 3, if not more.
  - This repeated fire schedule is necessary because weather affects how the fire burns (i.e. wet years vs. dry years).
  - Two heavier prescribed burns followed by smaller fires to maintain open conditions.
- Concerns were raised over whether or not Oak could regenerate with big prescribed burns
  - Some suggested that once the system is restored only smaller prescribed burns will be needed to allow the oaks to regenerate with acorns.
  - All agreed that the burn schedule needs to be varied with the average time between burns to ensure oak regeneration and to minimize over story kill. Also all seemed to agree that this would include some higher intensity burns.
- This system can't be opened with mechanical alone.
  - When mechanical is done without fire there is a need to apply herbicide to prevent mountain laurel from creeping in.

### **3. Of the deficit conditions for this system which ones are most important to address?**

- This system was tied with Pine Oak Heath as the most departed system, and is the most neglected system. All seemed to agree with this.
- All seemed to agree that this system needs prescribed fire and opening the canopy across all seral classes.
- Some suggested transitioning mid closed to mid open, late seral closed to go to early as well as to old growth open.
- All agreed fire is necessary to restore this system.

### **4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- This did not get discussed. The overall discussion for this system focused more on prescribed fire intervals.

#### **Megan summarized the group discussion with the following:**

- All agreed this system has too much of late closed.
- All agreed that it will require high intensity and frequent burning at start.
- Promoted as a system that is a very neglected could be because there's not a lot of economic value in harvests.
- Not as much of a composition issue compared to other systems because the dryness prevents maple encroachment.
- All agreed it is important to protect your seed source when burning.
- All agreed that there is a large evergreen shrub encroachment issue.

#### **PINE OAK HEATH**

### **1. Does the ecological departure analysis appropriately identify major structural needs of this system?**

- This system does not have Bps models for old growth.
- It was mentioned that pine beetle could be an issue in this system.
- This system has lost many seed trees.
- This system has very high shrub density at 55%.

### **2. Are both fire and mechanical treatment appropriate in this system? Are there other specialized treatments that need to be considered?**

- Some concerns that need to be addressed when managing this system include:
  - Smaller patches compared to shortleaf pine oak
  - More likely to be in rocky places
  - With the high levels of closed canopy there is a high risk for pine beetle outbreaks
- Mechanical and prescribed fire were all agreed to be treatment options.
- There are concerns over other species moving in and closing the canopy.
  - White pine as an example
- Treatment will be multi-year and multi-task to restore.

### **3. Of the deficit conditions for this system which ones are most important to address?**

- All agreed that opening the canopy was important.
- All agreed there was too much late seral closed.
- This system needs to have late closed redistributed to other open classes (early and mid) all agreed on this.

### **4. How many acres are desirable to restore/maintain within this system in the next 20 years? What is a realistic goal?**

- A strawman was proposed and it was suggested that it might be achievable based on the acres that have been done on the Grandfather district.
- All recommendations for management require follow up fires or other maintenance to maintain open conditions.
- Several felt that fire was a key tool to achieve this goal.

### **Megan summarized the group discussion with the following:**

- All agreed that this is a neglected system.
- This provides a great opportunity to have a good fire program.
- There was conversation about where it occurs and the ability to burn.
- Beetles are an issue with forest health.

### **CLOSING MEETING SUMMARY COMMENTS**

Megan posed the question: How to pick which of the six systems based on limited resources should be a high priority for restoration?

- Most agreed that there needs to be a regional assessment of the where, as opposed to targeting one or two systems. The nature of the data suggests that these systems are quite intermingled. Several suggestions included:
  - Looking at the watershed level
  - Management area designations
  - Ranger districts
  - Identifying what systems are most in need and finding regions that maximize restoring these systems collectively
- Many felt that a consistent fire approach is a key part in restoring large acreage across all systems.
- It was suggested shortleaf might be a higher priority based on each district's needs.

### **PARKING LOT ISSUES/POTENTIAL FOR FOLLOW UP:**

- There was a lot of interest in discussions revolving around how we would conduct this restoration and where on the ground. Also asked was how is implementation limited by designations and other factors?
  - The Nantahala/Pisgah Forest Partnership will be digging into the where and can provide more information on this.
- Questions about Josh's early successional statistics:
  - Why did you use canopy cover instead of canopy height? Josh will write up something that addresses this to go with the data.
  - WRC is using the same data and analyzing it slightly differently, it would be nice to tie these two analyses together once completed.
- Define "Maintenance": If we use this term in the future we will explicitly define it at the outset

- For now, these are still needs that we won't be able to address at this time
  - How do we account for transitions, maybe Landscape Forecasting?
  - How do invasive plants play into this analysis?
  - How do we get at more compositional questions?
  - What are the Effects of Climate Change? There is a need for baseline monitoring and to filter the restoration goals through a resiliency analysis/study.