

General Comments on Restoration – National Forests in NC

Overall - Restoration Goals:

- Need to consider restoration needs on the broader landscape, not just on national forest lands.
- Need to build our (collective) capacity for restoration projects – identify where we can couple it with economic development opportunities.

How do we get there?

- Keeping projects and contexts focused at the landscape level is important.
- Be careful not to let the rapid assessment process prevent quick action when needed.
- Organize a “partner’s consortium” to raise funds that can augment USFS resources, support volunteer projects, and help manage a volunteer workforce.
- Be careful not to compartmentalize topics.
- Look for projects that overlap to gain efficiencies.
- Start small – with attainable and discreet goals.

Who needs to be involved?

- Organize and recruit a volunteer workforce to conduct restoration projects –this is a potential workforce for accomplishing restoration projects
- Use FS restoration projects as part of a training curriculum to develop a private, for-profit ecological restoration industry in WNC.
- Use existing information and education outlets to showcase progress in accomplishing these goals.

1. Restore Stream Systems and Watersheds to a Healthy Condition

Restoration Goals:

- Improve water quality.
- Enhance riparian habitats.
- Reduce sedimentation.
- Improve habitat for aquatic species.
- Protect high-value occurrences of hemlock and replacement species (for declining hemlocks on riparian sites).
- Restore eco-hydrologic function in riparian areas
- Make all roads and trails sustainable.

What do we need to know:

- What is the priority for restoration in a given watershed?
- What are options for overstory replacement?
- What is the level of impairment and monitoring needs - coordinate with NC Dept. Of Water Quality (DWQ).
- Verify that waters are appropriately classified by DWQ.

How do we get there?

- Stream condition – define negative impacts.
- Assess causes of impact (roads, trails, fish passage barriers, dispersed recreation, loss of riparian cover).
- Identify options for improvements (closure, reconstruction, relocation; vegetative treatment or restoration).
- Remove man-made fish passage barriers like old roads and perched culverts (like in Santeetlah Creek).
- Identify forest users and the locations where they are causing negative impacts to trout streams (like Upper Tellico).

Who needs to be involved:

- Identify partners that can assist with these efforts. Establish partnerships beyond forest boundaries to address larger watershed issues.

2. Restoration of Rare Native Communities; Threatened and Endangered Species (combined with Topic #7)

Restoration Goals:

- Protect high-value occurrences of rare native communities (aquatic and terrestrial) including hemlock stands, chestnut stands, and high elevation grassy balds.
- Protect and manage for threatened and endangered plant species.

What do we need to know:

- What are the rare communities where are they located?
- What are the threats to rare wildlife and native communities?
- What is the current population data available for Threatened and Endangered (T&E) species?
- What are the appropriate management strategies necessary to preserve the communities/species of concern?
- How do we want to prioritize our efforts?

How do we get there:

- Identify and prioritize rare communities by global rank and threat (include wildlife habitat considerations such as connectivity and rare habitat types). Give increased consideration to rare habitats such as caves, rock outcrops, serpentine barrens, spruce/fir forests, shortleaf pine stands, bogs, etc...
- Identify candidates for chestnut restoration and conduct Phytophthora root disease risk evaluation
- Identify balds in high priority areas and increase grazing in these habitats
- Identify hemlock stands that are untreated but recoverable, in good health and treat using the latest science when specimens can still be saved
- Identify and maintain hemlock sites that are viable for future reforestation or as long-term refuges
- Prioritize hemlock stands for treatment by identifying healthy areas of hemlock, presence of T&E species, presence of streams that are protected by hemlocks, Carolina hemlock bluff forests and areas where chestnut is dominant
- Prioritize rare communities/species impacted by recreation (recreation as a vector as well as 'trampling' of species).
- Recognize and develop silvicultural (timber management) prescriptions and other tools such as fire for treating communities and species either already determined as threatened or in jeopardy of becoming threatened.
- Control invasives in areas where T&E sp. exist – complete the invasives EA to allow for greater management on Forest.

- Increase natural heritage databases with current fauna information.

Who needs to be involved

- College and university professors and students, The Nature Conservancy, State and Natural Heritage, Eastern Native Tree Society, Student Conservation Association, environmental groups such as Wildlaw
- Form a concentrated regional landscape level group focused on HWA
- Educate the public through local outfitters, trail and hunting clubs, retail outlets.
- Better communication and coordination among wildlife, fire and timber disciplines.
- Engage community/local volunteers to assist with monitoring.

3. Restore Fire-Dependent Ecosystems

Fire is a factor that contributes to the diversity of plant communities in the Southern Appalachians. Climate change and long-term fuel accumulation have and will continue to increase future wildfire risk and occurrence.

Restoration Goals:

- Restore and maintain fire-dependent ecosystems (but strive to do no harm).
- Include other types of disturbance-dependent communities – and don't limit the management options to only fire.
- Include Short-leaf pine habitats and other fire-adapted ecosystems.

What do we need to know:

- Burn areas must be identified before time and money is spent on other vegetation projects - burning projects affect other types of regeneration/restoration proposals (can be positive or negative).
- Identify areas for fire management that meet multiple resource objectives

How do we get there?

- Emphasize restoration of fire to open areas like meadows and balds, fire-dependent pine stands such as Table Mountain and pitch pine, and xeric oak systems and oak savannahs.
- Emphasize understory burns to control laurel and rhododendron and prescribed fires to enhance habitat for threatened and endangered species, control invasives, and reduce fuel loads and initiate recovery in areas impacted by Southern Pine Beetle.
- Funding and days for burning are limited – all project burn locations should be proposed by an interdisciplinary team so all resources and objectives are considered. Whenever possible, Fire Learning Network resources should be considered.
- Restore, and maintain grassy balds at Roan Mountain to a desired future condition based on plant and animal diversity considerations.
- Look for efficiencies in planning burn programs:
 - Look at scale of projects.
 - Consider firing techniques.
 - Consider multi-day burns.
 - Not 100% black should always be the desired outcome.

- Coordinate fire planning with other resource activities (to insure compatibility).
- Develop prescription for open oak woodlands (gold-winged warbler habitat) – a burn schedule is needed.
- Require an interdisciplinary process which includes scientists and other partners in prescribed fire planning.
- Monitor effects from different fire returns.
- Evaluate growing season burns, establish restoration burn cycles versus long term maintenance needs, evaluate the use of fire in wilderness areas, and create small burns for public information and education.
- Monitor ecosystems that are not clearly fire-dependent.
- (Emphasize) fuel reduction in areas with a rapidly growing wildland-urban interface.
- Increase use of fire in upland areas, pine stands, and rare native plant communities.
- Select large areas for restoration/development of pitch pine/table mountain pine and oak savannahs. Must commit to repetitive burning.
- Increase use of landscape-level prescribed fire
- Include acres burned for balds and oak-dominated forests (in target accomplishment).
- Limit fire management to appropriate ecological systems (table mountain pine, shortleaf pine, dry ridges, slopes, etc...). Don't harm mesic systems by igniting them.
- Identify in fire plans areas where fire should be excluded.

Who needs to be involved?

- Consider opportunities to work with neighboring conservation landowners (use GIS data to identify).
- Use updated GIS layers from partners to identify adjacent ownerships and ecological data.
- Use the Fire Learning Network, Southern Research Station and other partners to assemble, collect and analyze fire-related data.
- Strengthen and develop a network of resource managers for project planning and implementation (Fire Learning Network, train-the-trainer).
- Increase education and outreach to local communities about the ecological and economic benefits of prescribed burns (will reduce complaints and gain local cooperation).

4. Restoration of Diversity in Low-Diversity Forest Stands

Many forested areas that were re-planted or naturally regenerated after timber harvesting and other disturbances have become dominated by even-aged single species such as white pine, yellow poplar, or loblolly pine and do not provide the diverse habitat that typifies native communities in the Southern Appalachians. Many predominantly oak stands are in decline due to old age, drought, insects, and diseases. On upland sites where decline is worse, regeneration of stands must be done before the seed source (overstory oak) dies.

Restoration goals:

- Restore species structure and age diversity to low-diversity, virtually monoculture stands.
- Restore lost oak habitat and maintain existing oak forest.
- Develop new markets for restoration products.

What do we need to know?

- Define “diversity” with regards to forest stands and identify desirable future conditions.
- ID and map stands that have low structural and species diversity, including white pine dominated stands and tulip poplar stands with low herbaceous diversity.
- Prioritize sites for restoration and logging based on economic maturity, ease of access.
- Develop site-specific treatments for each stand, not a “one size fits all approach.”
- Prioritize where oak restoration is appropriate: Conduct oak decline risk rating in rapid assessment areas as a guide for oak restoration and maintenance, including soli mapping and assessments of hydrologic function.

How do we achieve our goals?

- Restore species structure and age diversity:
 - Focus on management of old white pine plantations, yellow poplar monocultures and old field locations (with high components of poplar and red maple) for oak regeneration.
 - Treatments must be site specific but may include thinning, burning, intermediate stand treatments, and direct harvest.
 - Use silvicultural techniques to reintroduce the hardwood species (such as oak or hickory or other mid-tolerant shade-tolerant species) into near monoculture, such as yellow poplar or white pine stands

- Use site-adapted species for replanting. Replace undesirable species with more desirable species (chestnut, shortleaf)
- Replace undesirable species (white pine, loblolly invasives) with more desirable species (chestnut, shortleaf pine)
- Acknowledge that conifers are a part of ecological succession.
- Restoring oak diversity
 - Prioritize conducting oak decline risk rating and to identify and treat oaks.
 - Consider the following areas for targeted restoration: old clearcuts (for advance oak regeneration release), upland sites to prevent loss of seed source, and pine plantations, where appropriate.
 - Conduct midstory treatments to encourage advance oak regeneration (fire).
 - Don't "boiler plate" one management method for all oak species. (i.e. red oaks are different from northern red oak, chestnut oak, etc).
 - Recognize that yellow poplar and white pine naturally occur on some sites and have value. Maintain these and other non-oak species where best adapted.

Who needs to be involved?

- Expand partnerships with forest products industry and timber harvesting operations to identify areas of common ground for restoring diversity.
- Work with industry to create markets for products removed in intermediate treatments.

5. Restoration of Viable Native Plant Communities by Controlling Invasive Species

Restoration Goals:

- Increase invasive exotic inventory, monitoring and control efforts.
- Increase information exchange to external partners.
- Identify and prioritize species and areas to be controlled.
- Prevent new infestations from being established.
- Prioritize treatment of “high risk” stands or plant communities.
- Protect “clean” areas or areas of high value or ecological sensitivity (riparian, bogs, rare species) - start in the backcountry, work toward the edges.

What do we need to know?

- Identify locations where other restoration projects will be emphasized (to meet some of the other identified restoration goals).
- Identify invasive threats to rare community and species (ex: Linville Gorge).
- Identify potential partners, and understand their resource and management priorities.
- Identify early invasion areas for invasives.
- Identify habitats in advance of high-threat pest species moving in (ex: emerald ash borer).
- Identify areas that are or could become infestation sources.

How do we achieve our goals?

- Consider use of all control methods: mechanical, manual, chemical, biological and apply integrated pest management. Focus more on chemical treatment than in the past
- Complete more comprehensive NEPA documents that will provide for long-term flexibility and ability to control non-native invasives when and where its needed through a variety of methods.
- Increase capacity for the Forest Service and partners to collect and grow native species to establish in control areas.
- Incorporate inventory and monitoring data and GIS data into the rapid assessment process.
- Plan For follow-up project monitoring after invasive treatment - on a yearly basis.

- Set clear objectives that identify the steps that will be taken to save a threatened community.
- Where necessary, re-establish native vegetation in areas treated for invasives.
- Possible use of selected herbicides to control invasive species in designated Wilderness.

Who needs to be involved?

- Establish a volunteer clearinghouse and engage and educate volunteers in early detection, assessment, monitoring and control efforts.
- Create a “Cooperative Weed Management Partnership” to enable external partners to map and monitor invasives.
- Use tools such as WIMS and EDDMapS to enable early detection and rapid response by citizens and partners.
- Participants in a cooperative weed management area can include government agencies, non-governmental organizations and groups of individuals including:
 - Federal agencies: USFS, NPS, DOT, DOT
 - State groups: Cooperative Extension, NC Parks and Recreation, universities
 - NGOs and individuals: adjacent landowners, recreation groups, hiking groups, garden clubs, Appalachian Trail Conservancy, The Nature Conservancy, SAMAB
- Make available a FS staff person with job targets as the point of contact and provide them with access to herbicide/tools for volunteer efforts

Specific invasive control projects identified:

- Kudzu along the Cheoah River and Nantahala Gorge,
- Oriental bittersweet in the Fontana Lake area.

Additional thoughts:

- Consider more than invasive plants, but also issues created by invasive wildlife, especially invertebrates.
- Invasive species management must be considered when addressing other restoration needs in rapid assessment projects, such as early successional wildlife plots/fire and natural disturbance openings.

6. Wildlife Habitat

Many wildlife species are at risk and/or in decline. There is broad support for wildlife habitat restoration, but disagreement on how to get there.

Restoration goals:

- Focus the ecological restoration of a variety of wildlife habitats.
- Emphasize restoration of habitats suitable for key species, including sensitive species such as the golden-winged warbler.
- Improve the age structure of existing forests – increase early successional habitat when needed, including mid and high elevation early successional habitats.
- Seek common ground on restoration goals, including a definition of early successional habitat (ES), priority species and habitat types, and desired outcomes.

What do we need to know?

- Assess the present condition of early successional habitat in a management area:
 - What ES is already there?
 - What is the % of ES today?
 - What is the quality of ES?
 - How large are these areas?
 - How is the ES currently managed?
 - What is the optimum percentage of early successional habitat to meet desired ecological goals?
 - Identify habitat types across ownerships – not just on federal land.
 - Where are the high priority areas for establishing additional ES?
 - What is the breakout of all forest structures, county by county, landowner by landowner, forest by forest?
 - What is the juxtaposition of all the habitat types to each other, how do they relate to one another across the landscape?
- How successfully do existing habitat types support the desired ecological goals?
 - What species are being managed for?
 - How much habitat is there?
 - What additional habitat is needed?
- Identify key habitat areas for targeted species, including game and nongame.

How do we achieve our goals?

- Restore previous wildlife openings and create new ones in old pine plantations, tulip poplar and other monoculture stands. Management techniques for openings could include clearcuts, chemical mowing, rotational discing, fire management, mechanical treatment, ringing of undesirables, and creation of roads and edges.

- Connect isolated early successional habitats.
- Discourage invasive species spread between wildlife openings, and consider isolating openings that may increase invasive risk.
- Avoid openings in mature stands that are approaching old growth characteristics, especially far from existing roads.
- Address wildlife habitat concerns using state wildlife action plan as a guide for nongame species.
- Focus efforts to improve oak and grass/forb diversity.
- Use stewardship contracting timber management to create early successional areas across the landscape (look at options for lands outside the timber base).

Who needs to be involved:

- North Carolina Wildlife Resources Commission
- Birding groups (Partners in Flight, Audubon)
- Southern Research Station
- Academic community
- Conservation groups (Ruffed Grouse, Wild Turkey Federation, Quail Unlimited)

Additional thoughts and concerns:

- Consider quality of early successional habitat on non-USFS lands when determining early successional goals.
- Consider the appropriate mix of all successional habitat types – there is not agreement on how much ES is necessary.
- “Creating” early successional habitat replaces one artificial condition with another artificial condition. Broaden wildlife habitat beyond early successional to consider a greater suite of species.
- Broaden wildlife habitat planning beyond shifting the age mosaic of habitats.
- Management emphasis needs to include both game and non-game species.
- Consider interests of hunters and the forest products industry.