CATEGORICAL EXCLUSION REVIEW

PROPOSAL INFORMATION

Proposal Name: Gauley Healthy Forest Restoration Project

Proposal Date: 8/5/2020

Proponent Name: Monongahela National Forest

Line Officer: Richard Raione

District: Gauley Ranger District

County(ies): Greenbrier, Nicholas, Pocahontas, Webster

Anticipated Implementation: Spring 2020

Signing Authority: District Ranger

PALS Tracking #: 57335

Project File:
https://usfs.box.com/s/0fsaym1wi76s6mwq8r6gag4rr3pmmz97

GIS Info:
"T:\FS\NFS\Monongahela\Project\GauleyHealthyForestRestoration"

General Location: The project area is adjacent to, and east of Richwood, and extends eastward to the Cranberry Mountain Nature Center. West Virginia Route 39/55 bisects the project area. County road 7/2, Forest Road 99 and the Cranberry River form the northern boundary of the project area, and private lands form the southern boundary

Applicable Management Areas: management areas 3.0 vegetation diversity and 4.1 spruce and spruce hardwood ecosystem management

Boundary Description: Beginning in Richwood West Virginia. In the North part of Richwood, start at the ridge top west of CR 7, follow the ridge north to the boundary of the Monongahela National Forest. Follow the forest boundary west to CR 74. Follow CR 74 north to the intersection with CR 76. Follow CR 76 north to intersection with forest service road 99 (fs99). Follow fs99 north/northeast to the intersection with fs848. Follow fs848 approximately 1.3 Miles then heading northeast down slope to the mouth of Queer Branch and intersecting fs76. Follow fs76 south/southeast till the Cranberry Glades Botanical Area (CGBA). Follow the northern and eastern boundary of CGBA. Head upslope to intersect with fs150 (Scenic Highway) Follow fs150 southwest, eight tens of a mile, to the intersection of state route 39 (WV39) Follow WV39 northeast, two tenths of a mile then head downslope to the southeast to the boundary of the Monongahela National Forest. Follow the forest boundary westward for approximately 28 miles back to Richwood and the beginning of the project boundary description.

Elevation Range: 2,300 to 4,500 feet

Watersheds: North Fork Cherry River and Cranberry River and a small portion of Spring Creek

APPLICABLE CATEGORY/IES

This proposal is categorically excluded from documentation in an EA or EIS because it fits the following category:

Applicable Category: Section 603 of HFRA (16 U.S.C.6591b) (FSH 1909.15, 32.3(5)): Insect and Disease Infestation.

This category is applicable for this project because all project activities comply with the Healthy Forest Restoration Act section 603 requirements. The project area:

- Does not include more than 3,000 acres. (The project area may be greater than 3,000 acres if the actual treatment areas are 3,000 acres or less).
- Shall be limited to areas in the wildland-urban interface or to areas in Condition Classes 2 or 3 in Fire Regime Groups I, II, or III outside the wildland-urban interface.

- Shall be identified through a collaborative framework such as described in *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan*, or is developed and implemented through a collaborative process that includes multiple interested persons representing diverse interests and is transparent and nonexclusive; or meets the requirements for a resource advisory committee under subsections (c) through (f) of section 205 of the secure rural School and Community Self-Determination Act of 2000 (16 U.S.C;7125).
- Shall be consistent with agency and departmental procedures and applicable resource management plans;
- Shall not be in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness;
- Herbicides, insecticides, and pheromones may be used, but their use must be consistent with the applicable Forest Plan;
- Shall not include the construction of new permanent roads or other new permanent infrastructure but may include the construction of temporary roads if they are decommissioned and restored within 3 years of the end of project activities;
- Treatments may include the sale of vegetative material if the primary purpose of the activity is to reduce the potential spread of insect and disease infestations and hazardous fuels;
- Maximizes the retention of old-growth and large trees, as appropriate for the forest type, to the extent that the trees promote stands that are resilient to insects and disease; and
- Considers the best available scientific information to maintain or restore the ecological integrity, including maintaining or restoring structure, function, composition, and connectivity.

PROJECT ACTIVITIES

The Gauley Ranger District of the Monongahela National Forest proposes to conduct hazardous fuels reduction and insect and disease infestation control activities on 2,984 acres of the 48,000-acre project boundary. The project area is adjacent to, and east of Richwood, and extends eastward towards the Cranberry Mountain Nature Center. West Virginia Route 39/55 bisects the project area. County road 7/2, Forest Road 99, and the Cranberry River form the northern boundary of the project area, and private lands form the southern boundary. The general area is managed under Forest Plan management prescriptions 3.0 and 4.1. Possible treatments may include, but are not limited to the construction of temporary roads and the upgrade and maintenance of existing designated roads; construction of fuel breaks; the use of herbicides, insecticides, and pheromones; use of pesticides; application of prescribed fire; timber harvesting, including salvage (commercial sale); mastication, mowing, thinning, clear-cut or other thinning methods; and other allowable actions.

All design criteria, best management practices, and mitigation measures developed for this project (as approved by the Line Officer) will be implemented as well as all applicable measures outlined in the Forest Plan Standards and Guidelines. As such, resource specialists conducted their analysis with the assumption that these practices will be applied during project implementation.

Thinning and Associated Treatments

Thinning. Forest Plan, page A2 "The thinning method is an intermediate cut that . . . removes high risk . . . low quality, diseased, and over mature trees to increase the health, development, and growth of the residual trees in a stand. . .. Thinning is applicable to all of the forest types found on the Forest."

The primary purpose of treatment is stand improvement to develop resilient healthy stands more resistant to insects, disease, or fire. Some, but not all of trees to be removed in the thinning treatment are dead, dying, or damaged from an active infestation of insects or disease (See Forest Service Handbook 2409.19 Chapter 70) such as hemlock wooly adelgid, beech bark disease, emerald ash borer, and other native pests. Wood rot fungi related to damage from recurrent storm events (including the Derecho and Hurricane Sandy in 2012 and tornados in 2016) are also a major factor in the need to remove and salvage trees. Timber volume from salvage will vary depending

on individual stand characteristics, but it is estimated to be less than 25 percent of the volume. Depending on timing of salvage needs, additional entry into specific areas could be needed for salvage.

Thinning is expected to remove about one-third of the basal area in a commercial harvest, which removes mostly sawtimber. Within treatment areas, large trees will be favored to be left to the extent that they are healthy and have potential to persist within the stand. Many large trees would be cut to salvage, or because of dead tops and branches, or because of active infestations of insects or diseases. Removing some trees by thinning, whether commercially or non-commercially, is part of an Integrated Pest Management method to minimize or prevent the development of pest problems (Forest Plan Goal VE26). In some areas, especially in or near the fuel breaks and around Summit Lake campground, treatment may be needed in addition to commercial harvests or instead of commercial harvests if trees to be removed are not suitable for timber products.

Firewood gathering opportunities may be provided (Goal TR14). Many or most of the trees to be removed have been determined by the Forest to be a risk to public safety, so personal use firewood may include dead, down or green trees to be removed (Standard TR15). Some of the areas to be treated may be made available to the public as green firewood sale to accomplish the resource management objectives of reducing fire and insect and disease risk (TR16). Closed roads may be opened temporarily for firewood collecting (TR17).

Commercial timber harvest involves the use of hand or mechanical felling and removal from the forest by helicopter or skidder.

Vine Control. Vine Control may be done in stands to be thinned– Forest Plan page A16. "Vines interfere with the growth of trees, causing decreased growth, deformity, and broken tops. Broken tops allow entrance for insect and diseases, decreasing the vigor of a stand. Vines are severed with cutting tools near the ground. (This treatment may be done three growing seasons prior to harvest.)

Clearcutting (Regeneration) and Associated Treatments

Clearcutting (Regeneration). Forest Plan, page A2 "The clearcutting method harvests most or all of the trees within a stand in one removal. Typically, some reserve trees are left to meet wildlife habitat or other resource needs." Commercial timber harvest involves the use of hand or mechanical felling and removal from the forest by helicopter or skidder. Firewood gathering opportunities may be provided with these treatments also, as described under thinning.

The primary purpose of treatment is to develop healthy resilient young stands that will be more resistant to insects, disease, or fire in the long-term. Up to 10 percent of timber to be removed may be salvage of material that is dead, dying, or damaged from an active infestation of insects or disease.

Associated with the clearcutting treatment is ***Site Preparation with Hand Tools for Natural Regeneration*** – Forest Plan page A15. "The objective of site preparation is to enhance germination, sprouting, and survival of natural regeneration. Site preparation includes cutting down residual trees between 1 and 5 inches in diameter during or immediately after a regeneration harvest. Normally red spruce, hemlock, dogwood, serviceberry and shrub species that produce mast for wildlife are not cut. This treatment opens up the forest floor to increased sunlight to improve seed germination potential, promotes sprouting of cut trees, and reduces shading that could inhibit the growth of shade intolerant and moderately tolerant species."

Vine Control may be done in stands to be regenerated– Forest Plan page A16. "Vines interfere with the growth of trees, causing decreased growth, deformity, and broken tops. Broken tops allow entrance for insect and diseases, decreasing the vigor of a stand. Vines are severed with cutting tools near the ground. (This treatment may be done three growing seasons prior to harvest to prevent sprouting of vines during the regeneration period that would harm young trees.)

Additional associated treatments may be included as needed to enhance regeneration such as hand tree planting, fencing, or caging to protect from deer browse, weeding to enhance species composition, and treatment of non-native invasive plant species. These treatments would involve hand tools and hand labor, which would involve minimal ground disturbance. Scalping of each planting spot with hand tools, spot spraying of herbicides, or individual tree fertilization could be part of the tree planting methodology. These potential treatments would occur during the regeneration period (normally 1 to 5 years after the harvest and site preparation) and are done with hand tools. Natural regeneration is typically rapid and successful in this area, so tree planting and associated treatments are unlikely to be needed on more than 100 acres, and planting could be used to enhance species diversity.

Crop tree release (Forest Plan, page A – 16) may be done within regenerated areas to increase tree species diversity that would further enhance resistance to insects, disease, or fire. Integrated Pest Management methods would be used to minimize or prevent the development of pest problems, and could include the use of insecticides, for example, to preserve hemlock trees facing mortality from hemlock wooly adelgid (VE26, 27, 28, 29, 32, 34, 35, 36, and 37). It is anticipated that use of insecticides within the project area would be unlikely to be needed on more than 20 acres overall, with less than 20 stems per acre being treated in most cases.

Herbicide. Forest Plan page A16. This treatment will be used to control competition with diseased beech sprouts, only in stands where beech bark disease occurs and has resulted in dense competition that excludes tree and understory species. In most cases, it will be possible to control competition with diseased beech sprouts by cutting alone, as described above in **Site Preparation with Hand Tools for Natural Regeneration**. Diseased American beech trees should not be left standing in regeneration cuts, since the resulting diseased beech thickets are not a desired outcome of the treatment. For herbicide treatment of diseased beech, herbicides would be applied to individual stems by stem injection (cut surface treatment) or basal spray, both methods using manual labor.

Prescribed Fire and Fuels Reduction Treatments

Prescribed Fire – Broadcast. Prescribed fire activities will be implemented during either the Spring (prior to green-up) or Fall (dormant) seasons to promote fire adapted species and to reduce leaf litter and the threat of uncharacteristic wildfire. A low to moderate fire intensity will be used to reduce leaf litter while maintaining fire adapted overstory trees. The result of prescribed fire will be to create a healthy forest by reducing dead woody debris, increasing sunlight by reducing competition from fire intolerant tree species, promoting native grasses, increasing oak regeneration, and increasing wildlife populations. Natural features such as roads, streams, and rivers will be used as much as possible to limit the impact on the land. In instances where handline or bulldozer lines need to be constructed. Minimum Impact Suppression Tactics (MIST) techniques will be used. The concept of MIST is to use the minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response. In some cases, MIST may indicate where cold trailing or wet line may be more appropriate than constructed handline. In another example, the use of an excavator may be used rather than a bulldozer. Individual determinations will be dependent on the specific situation and circumstances of each fire. Prescribed fire would be implemented in this area periodically until resource objectives are met.

Prescribed Fire – Piles. An associated treatment that consists of creating hand piles along private property boundary and Forest Service infrastructure will reduce logging slash and woody debris created from the thinning project within the fuel break. Piles will consist of top wood and non-merchantable wood. Piles will be burned during low fire danger days when spread potential is low. No handline will be constructed for hand piling. Piles may be constructed whenever there is a change in fuel loadings that may influence the effectiveness of the fuel break. An example of this would be a weather event that blows down trees within the fuel break.

***Fuel Breaks**:* Mechanical fuel breaks will be constructed along portions of private property and Forest Service infrastructure and will typically be within thinning treatment units. This mechanical fuel break will consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees within 100 feet of private property or Forest Service infrastructure. Slash created from harvest operation will be mechanically or hand piled and burned or pulled away from private property or Forest Service infrastructure by the contractor approximately 100 feet from property boundary. Fuel breaks will be created and maintained by using chainsaws, prescribed fire, and/or mowing. Prescribed burning may be used within fuel breaks to reduce fuel loading of brush, shrubs, and trees while encouraging the growth of fire adapted species. These fuel breaks will create defensible space in the event of a wildfire in the vicinity. The fuel breaks will be evaluated periodically for effectiveness of the defensible space and to determine if future treatments are needed.

Roads

Road maintenance. Road maintenance will occur as needed on system roads within the project area to provide for egress and ingress in case of fire and for firefighting as well as timber haul. It includes mowing, grading, cleaning or replacing culverts, and applying surface material. Some of the culverts to be replaced are at stream crossings, such as the one on FR 946 where it crosses Spencer Run. Road maintenance also includes removing hazard trees (using commercial sale methods where practical) that may fall and block the road access and to thin the canopy across and along roads so they can act as fuel breaks (Forest Plan RF11).

Closed roads may be opened temporarily for firewood collecting (TR17).

Temporary roads. Temporary roads used for removal of timber products involve blading a route with cut and fill slopes, providing for water crossings during use, and decommissioning after use. Temporary roads used for hauling products may also involve gravel surfacing. Temporary roads for hauling or skidding are not anticipated to be needed on very steep slopes (more than 50 percent). Building or using temporary roads on steep slopes (40 to 50 percent) would be avoided where possible. If during implementation, operation on steep slopes (40 to 50 percent) is found to be needed, then operation on these slopes shall be analyzed on a case-by-case basis to determine the best method of operation while maintaining soil stability and productivity according to standard SW07.

Temporary roads will be needed for removal of timber products. Temporary roads will be decommissioned and restored within 3 years of the end of project activities as required by the Section 603 of HFRA (16 U.S.C.6591b) (FSH 1909.15, 32.3(5)). Decommissioning methods used for temporary roads should allow for fuel reduction by brushing to retain defensible space, where appropriate. Decommissioning methods for temporary roads built on existing linear wildlife openings should consider the need to retain defensible space as well as maintenance of wildlife and pollinator plantings after use.

Decommissioning of temporary roads used for both hauling and skidding would follow guideline RF13. The road profile should not normally be returned to contour during decommissioning. Decommissioning should also allow for treatment of non-native plant species, as appropriate.

Non-Native Invasive Species

Existing and new infestations of high-priority nonnative invasive plants in activity areas will be treated before, during, and after project implementation to prevent the spread of nonnative species into new areas. Treatment methods will include hand-pulling, mowing, grubbing, biological control, and herbicide application. The species that may be controlled and the herbicides that may be used are listed in Table 2.1 of the *2010 Forest-wide Nonnative Invasive Plant Management Project Environmental Analysis* (beginning on page 2 to 7). All design criteria, mitigation measures, and monitoring requirements listed in Chapter 2 this analysis (page 2 to 15 through 2 to 20) will be followed. Herbicide use on nonnative invasive species has also been examined under this analysis.

Project Implementation

- It is estimated that project activities will occur within a 5 to 7-year timeframe
- During implementation, conventional units may be harvested by helicopters at the discretion of the responsible official.
- An NNIS implementation plan will be developed prior to implementing the action.
- Forest Plan standard WF14 will be coordinated with specialists and the responsible official during implementation.

Project Design Criteria

Standards VE13 and WF13- Prior to implementation, surveys for threatened, endangered, and sensitive (TES) species would be conducted. TES plant surveys will be conducted from June 1 through September 30 (time of year when plants are most likely to be detected). TES species surveys will be conducted in project areas that have not previously been surveyed, where optimal habitat conditions persist. If any occurrences of TES species are found in or near any activity areas, occurrences will be documented. Implementation will not be allowed to proceed, until protective measures have been established to avoid or minimize negative effects. Protective measures could include the following mitigations: monitors on site, avoidance areas, temporary fencing, translocation, etc. Protective measures will be developed by the biologist or ecologist and approved by the Responsible Official.

Project Acreages and Mileages

Table 1. Project acreages

Treatment	Acreage
Thinning, using ground-based logging, without prescribed burning	1519
Thinning, using helicopter logging, without prescribed burning	741
Prescribed burning and thinning using ground-based logging	200
Prescribed burning (without thinning)	157
Regeneration harvest, using ground-based logging	242
Regeneration harvest, using helicopter logging	109
Fuel break, not included in other timber harvest in 3 locations	16
Total Treatment Acreage	2984

Table 2. Road mileages

Type of Road	Mileage	Width in feet
Temporary road construction	1.0	25
Temporary road reconstruction	1.9	25
Temporary road construction	28.6	12
Temporary road reconstruction	30.4	12
Maintenance of forest system roads	19.1	

Table 3. Regeneration Units

Harvest Unit ID	Treatment	Logging Method	GIS Acres
R3	Regen	Ground based	29
R4	Regen	Ground based	25
R5	Regen	Ground based	26
R6	Regen	Ground based	15
R8	Regen	Ground based	38
R9	Regen	Ground based	34
R10	Regen	Ground based	39
R74	Regen	Ground based	36
		Total Ground Based Regeneration Acres:	*242*
R1	Regen	Helicopter	41
H2	Regen	Helicopter	29
H7	Regen	Helicopter	39
		Total Helicopter Regeneration Acres:	*109*
		Total Acres	**351**

Table 4. Unit details

ID	Cut Type	Method	GIS Acres	Prescribed Burn
T11	Thinning	Conventional	24	No
T12	Thinning	Conventional	44	No
T13	Thinning	Conventional	48	No
T16	Thinning	Conventional	28	No
T17	Thinning	Conventional	20	No
T18	Thinning	Conventional	25	No
T20	Thinning	Conventional	33	No
T21	Thinning	Conventional	75	No
T22	Thinning	Conventional	34	No
T23	Thinning	Conventional	45	No
T28	Thinning	Conventional	17	No
T29	Thinning	Conventional	6	No
T31	Thinning	Conventional	34	No
T34	Thinning	Conventional	27	No
T36	Thinning	Conventional	50	No
T38	Thinning	Conventional	23	No
T41	Thinning	Conventional	23	No
T44	Thinning	Conventional	22	No
T46	Thinning	Conventional	17	No

ID	Cut Type	Method	GIS Acres	Prescribed Burn
T49	Thinning	Conventional	29	No
T50	Thinning	Conventional	33	No
T52	Thinning	Conventional	31	No
T53	Thinning	Conventional	17	No
T58	Thinning	Conventional	30	No
T65	Thinning	Conventional	68	No
T69	Thinning	Conventional	31	No
T70	Thinning	Conventional	33	No
T71	Thinning	Conventional	73	No
T72	Thinning	Conventional	8	No
T73	Thinning	Conventional	9	No
T75	Thinning	Conventional	11	No
T76	Thinning	Conventional	8	No
T77	Thinning	Conventional	18	No
T78	Thinning	Conventional	30	No
T79	Thinning	Conventional	53	No
T80	Thinning	Conventional	2	No
T81	Thinning	Conventional	60	No
T82	Thinning	Conventional	39	Yes
T83	Thinning	Conventional	30	No
T84	Thinning	Conventional	15	No
T85	Thinning	Conventional	102	No
T86	Thinning	Conventional	50	No
T87	Thinning	Conventional	16	No
T88	Thinning	Conventional	43	No
T89	Thinning	Conventional	35	No
T90	Thinning	Conventional	16	No
T91	Thinning	Conventional	16	Yes
T92	Thinning	Conventional	23	Yes
T93	Thinning	Conventional	13	Yes
T94	Thinning	Conventional	49	Yes
T95	Thinning	Conventional	51	Yes
T97	Thinning	Conventional	9	Yes
T96	Thinning	Conventional	30	No
T98	Thinning	Conventional	10	No
T99	Thinning	Conventional	15	No
T100	Thinning	Conventional	12	No
T101	Thinning	Conventional	6	No
Sub Total Conventional Thinning			***1719***	

ID	Cut Type	Method	GIS Acres	Prescribed Burn
H14	Thinning	Helicopter	51	No
H15	Thinning	Helicopter	145	No
H24	Thinning	Helicopter	97	No
H25	Thinning	Helicopter	24	No
H27	Thinning	Helicopter	35	No
H30	Thinning	Helicopter	49	No
H48	Thinning	Helicopter	13	No
H59	Thinning	Helicopter	64	No
H60	Thinning	Helicopter	19	No
H61	Thinning	Helicopter	73	No
H62	Thinning	Helicopter	31	No
H63	Thinning	Helicopter	63	No
H64	Thinning	Helicopter	63	No
H75	Thinning	Helicopter	14	No
Sub Total Helicopter Thinning			***741***	
Acreage Totals			**2460**	

MAP(S)

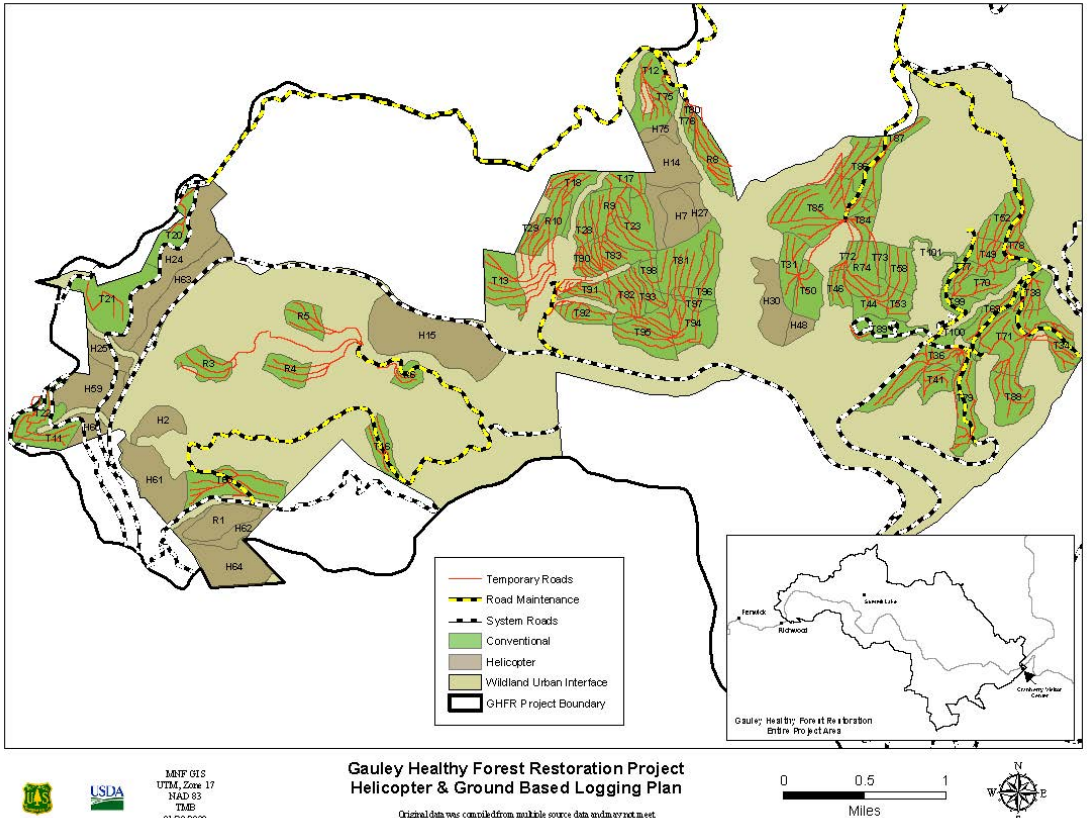

Figure 1. Helicopter and Ground Based Logging Plan

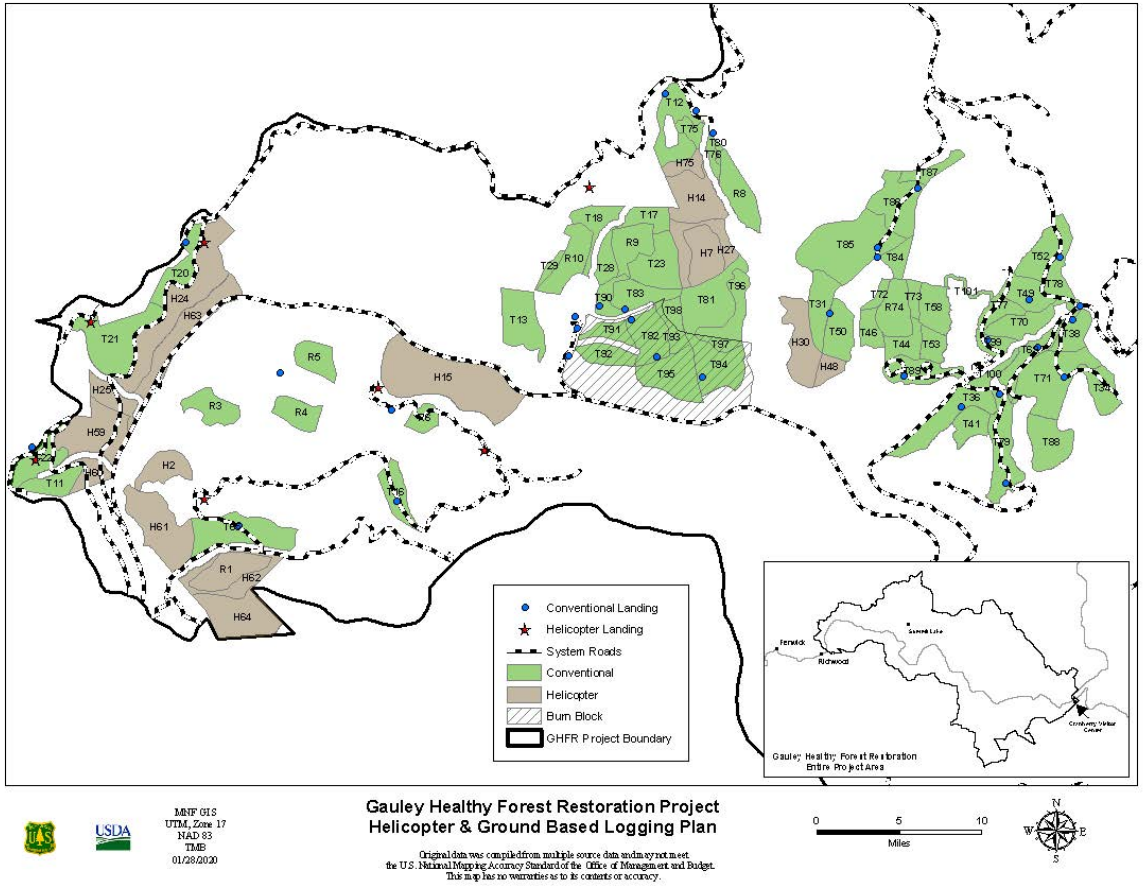

Figure 2. Helicopter and Ground Based Logging Plan continued

PROJECT SCREENING

REGULATORY CONSIDERATIONS

Given the nature of the proposal, the Responsible Official is requesting documentation to demonstrate compliance with the following regulatory considerations in addition to NEPA:

☒ **NFMA/Land Management Plan**

☒ **ESA**

☒ **Sensitive Species (FSM 2670)**

☒ **NHPA**

☒ **Tribal Consultation**

☒ **CAA**

☒ **CWA**

☒ **Pertinent Executive Orders**

Special Management Areas:

☒ **Scenic Area**

☒ **Wild & Scenic River Corridor**

☒ **Botanical Area**

☒ **Research Natural Areas**

☒ **National Natural Landmark**

AGENCIES, ORGANIZATIONS & PERSONS TO BE CONTACTED

Given the nature of the proposal, the Line Officer/Responsible Official is using a collaborative process that includes multiple interested persons representing diverse interests and is transparent and non-exclusive, as required by the Healthy Forest Restoration Act, Section 603(b)(1)(C)(i) and (ii)(I). A brief overview of feedback or comments provided is provided here.

This project is categorically excluded from the administrative review process under Section 603 of the Healthy Forest Restoration Act (16 U.S.C. 6591b) for projects that reduce the risk or extent of, and increase the resilience to, insect or disease infestation or that reduce hazardous fuels. This categorical exclusion category provides for up to 3,000 acres of restoration treatments in a project area. The overall project area boundary is large, at around 40,000 acres; however, this project boundary was originally created for a proposal that was being considered under an environmental assessment. Formally designated as the Gauley Integrated Spruce Restoration project, it is no longer considered for analysis. This project was in the pre-NEPA planning stage when it was abandoned and did not go out for a 30-day public comment period; however, much collaboration was completed with the public, partners, and other agencies in development of that proposal. As such, those collaboration efforts were used to develop the much smaller 3,000-acre categorical exclusion for which this collaboration documentation applies.

OUTREACH TO DIVERSE INTERESTS

This project was developed in partnership with West Virginia Division of Natural Resources and the West Virginia Division of Forestry in collaboration with a wide range of interested parties. We continue to engage these existing partners in the project-level collaboration. These partners work directly with District staff in project development.

In addition, the forest maintains a list of interested parties (individuals, non-governmental organizations, local government, Tribes, private landowners etc.) that were invited to participate in early collaboration of the original Gauley Integrated Spruce Restoration project.

The collaborative process for this project is a continuation of regular communication with interested stakeholders, partners, and parties for many diverse projects throughout the Forest, including, but not limited to the following:

Trout Unlimited; Canaan Valley Institute; West Virginia Department of Environmental Protection; West Virginia Division of Natural Resources; West Virginia Division of Highways; U.S. Fish and Wildlife Service; Army Corp of Engineers; Monongahela Outdoor Volunteers; New River Gorge Trails Alliance; Campground Host Program; Youth Conservation Corps; Central Appalachian Spruce Restoration Initiative; Rivers and Gorges Cooperative Weed and Pest Management Area; West Virginia Division of Natural Resources, Good Neighbor Agreement; Chicago Botanic Garden, Conservation and Land Management Internship Program, Natural Resource Conservation Service; West Virginia University Division of Plan and Soil Sciences; Dr. James Thompson, West Virginia University Soil Science Professor; American Chestnut Foundation; National Wild Turkey Federation; Boy Scouts of America; Cherry River Elementary School; Cranberry Mountain Nature Center; AmeriCorps; Richwood Area Chamber of Commerce; Blueprint; Hubcap; Richwood Rising; the Eastern National Forest Interpretive Association; Richwood Heritage Center; Camp Caesar; Weyerhaeuser Corporation; Friends of Blackwater, West Virginia Highlands Conservancy; the Nature Conservancy; and other field trips, trainings and workshops held for the public on Forest activities, projects, and issues.

The responsible official has undertaken the responsibility to ensure that project planning and collaboration for forest projects is continuous and the public discussions regarding forest management practices are ongoing and comprehensive. If the responsible official chooses to make commitments to the partners, they will be captures as part of the project record as appropriate. The responsible official will host information meetings and field trips for the public, if warranted, during project implementation to take further feedback on implementation.

RESOURCE PARTICIPATION IN ENVIRONMENTAL ANALYSIS REVIEW

The Line Officer/Responsible Official has requested the following resource areas to review the proposal to determine compliance with the regulatory considerations.

Table 5: Documentation of Review Completion

Resource	Review Complete
Botany	2/7/2020 Amy Coleman
Cultural/Heritage	2/12/2020 Gavin Hale
Fisheries	3/17/2020 Kyle Tasker
Fire/Fuels/Air Quality	3/17/2020 John Fry, Walt Walter, Jeremy Ash (Air Quality)
Hydro	3/17/2020 Tim Tolley
Lands/Special Uses	2/13/2020 Carol Whetsell
Recreation	2/3/2020 Matt Edwards
Scenic Resources	2/3/2020 Matt Edwards

Resource	Review Complete
Soils	2/7/2020 Adrienne Nottingham
Special Management Areas	2/3/2020 Matt Edwards
Silviculture	2/7/2020 Jane Bard
Wildlife	3/17/2020 Kim Tarter, Cheryl Tanner

ENVIRONMENTAL ANALYSIS REVIEW

NATIONAL FOREST MANAGEMENT ACT (NFMA) – LAND MANAGEMENT PLAN CONSISTENCY

The pertinent specialist has reviewed the proposal and made the following determinations regarding proposal consistency with applicable Land Management Plan direction, standards and guidelines.

Botany: Consistent

Cultural/Heritage: Consistent

Engineering: Consistent

Fisheries: Consistent

Fuels: Consistent

Hydro: Consistent

Lands/Special Uses: Consistent

Recreation: Consistent

Scenic Resources: Consistent

Soils: Consistent

Silviculture: Consistent

Special Management Areas: Consistent

Wildlife: Consistent

Other: Consistent

SUPPORTING PROJECT DOCUMENTATION

Table 6: List of documentation justifying this decision

Document Type	Location
Biological Assessment (Botany, Fisheries, Wildlife)	**GHFR_BiologicalAssessment_FINAL_2021_06_30**
USFWS Biological Opinion	Final_BO
Biological Evaluation (Botany, Fisheries, Wildlife)	GHFR BE_FINAL_02122021
State Historic Preservation Office Consultation	SHPO
Collaboration Documentation	20200319GHFRPCollaboration_Final

Commented [TAS-1]: Placeholder for BO. Rename as appropriate.

Commented [SD-FS3]: Update with info grom gavin

Commented [TAS-2]: Placeholder for SHPO Consultation. Rename as appropriate.

ENDANGERED SPECIES ACT

THREATENED, ENDANGERED, PROPOSED AND CANDIDATE SPECIES AND/OR CRITICAL HABITAT

The pertinent specialists reviewed the proposal and made the following determinations for threatened, endangered and/or proposed species (species not effected by project activities are not listed):

Table 7: TEPC Effect Determinations for ESA

Species/Habitat	Status	Proposed or Designated Critical Habitat Present?	Determination*	Brief Rationale (or refer to other project documentation)
Small Whorled Pogonia	Threatened	No	NLAA	Biological Assessment
Running Buffalo Clover	Endangered	No	NLAA	Biological Assessment
Indiana Bat	Endangered	No	NLAA	Applicable Biological Opinion terms and conditions will be implemented
Northern Long-eared Myotis	Endangered	No	NLAA	Applicable Biological Opinion terms and conditions will be implemented
Candy darter and project critical habitat	Endangered	Yes	NLAA	Biological Assessment
Cheat Mountain salamander	Threatened	No	NE	Biological Assessment
Virginia big-eared bat	Endangered	No	NE	Biological Assessment
Rusty Patched Bumble Bee	Endangered	No	NE	Biological Assessment
Shale barren rock cress	Endangered	No	NE	Biological Assessment
Virginia spiraea	Threatened	No	NE	Biological Assessment

* **NE** – No Effect; **NLAA** – May Affect, Not Likely to Adversely Affect; **LAA** – May Affect, Likely to Adversely Affect; **No Jeopardy** - Not Likely to Jeopardize the Continued Existence or Adversely Modify Critical Habitat

Commented [SD-FS4]: Species, habitat, determination (MII) for RFSS, reference BE for rationale

SUPPORTING PROJECT DOCUMENTATION

Table 8: Applicable Project File Documentation to Support ESA Compliance

Documentation Type	Location
Biological Assessment	GHFR_BiologicalAssessment_FINAL
Biological Opinion	

Commented [TAS-5]: Placeholder to add location of biological opinion.

SENSITIVE SPECIES (FSM 2670)

Commented [TAS-6]: The BE is still being written. I will add this section when it is completed.

The pertinent specialists reviewed the proposal and made the following determinations for sensitive species:

Species	Determination*	Brief Rationale (or refer to other project documentation)
	NLAA	
	NLAA	
	NLAA	
	NLAA	
	NLAA	
	NE	
	NE	
	NE	
	NE	
	NE	

SUPPORTING PROJECT DOCUMENTATION

Table 9. Applicable Project File Documentation to Support Agency Sensitive Species Compliance

Documentation Type	Location
Biological Evaluation – Threatened, Endangered and Sensitive Plants	GHFR BE_FINAL_02122021

NATIONAL HISTORIC PRESERVATION ACT (NHPA) – SECTION 106 REVIEW

The pertinent specialist has reviewed the proposal and made the following determination regarding Section 106 compliance:

No adverse effects to historic properties - 36 CFR 800.5(b). Section 106 Review has been completed and National Register eligible cultural sites are located within the project area. Modifications can avoid/protect cultural resources (see comment section).

COMMENTS

Protection measures established during consultation will eliminate or minimize direct and indirect effects to historic property. All historic properties identified would be marked and avoided during all phases of project implementation. Ground disturbing activities shall be prohibited within marked boundaries of historic properties.

The action has been analyzed for expected direct, indirect, and cumulative effects to historic property. For the purpose of this analysis, effect means the alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility for, the National Register of Historic Places (NRHP) per the definition in 36 CFR 800.16(i). Historic property means any prehistoric or historic district, site, building, structure, object or historical/cultural landscape included in, or eligible for inclusion in, the NRHP. The term historic property also applies to any cultural resource or property not yet evaluated to determine whether it is eligible for the NRHP. The term includes artifacts, features, records, and remains that are related to and located within such properties. The term also

includes properties of traditional religious and cultural importance to an Indian tribe or native Hawaiian organization and that meet the National Register criteria per the definition in 36 CFR 800.16(l).

The area of potential effect (APE) for the analysis of direct effects is defined spatially as the project area boundary. All management activities proposed by the project are confined within the project area boundary. The spatial boundary for the analysis of indirect effects extends beyond the project area boundary by 0.25 miles to consider potential visual effects to adjacent historic properties. The temporal limit used to evaluate direct, indirect and cumulative effects was ten years because the proposed actions will be completed within five years and the visual effects are likely to continue for up to five years post-treatment.

FIELD SURVEY AND CONSULTATION

The Forest Service will award a task order through contract to survey the APE. The survey will be a focused approach to identify historic properties at locations where previous surveys either had not been conducted, or where previous surveys were inadequate for the current analysis. The survey will be conducted in consultation with the West Virginia Division of Culture and History (WVDCH), the Absentee Shawnee Tribe of Oklahoma, the Eastern Shawnee, the Shawnee Tribe, the Delaware Nation, and the Seneca Nation. The resulting technical report will be reviewed by all consulting partners prior to implementation of ground disturbing activities. Protection measures, including avoidance, will be established for all historic properties identified to avoid adverse effects.

DIRECT AND INDIRECT EFFECTS TO HISTORIC PROPERTIES

This action will have no adverse effect to historic properties. Protection measures established during consultation will eliminate or minimize direct and indirect effects to historic property. All historic properties identified would be marked and avoided during all phases of project implementation. Ground disturbing activities shall be prohibited within marked boundaries of historic properties.

- **Thinning and Associated Treatments, including vine control** have the potential to effect historic properties. Protection measures, including avoidance where necessary, would be necessary to eliminate or minimize adverse effects.
- **Clearcutting (Regeneration) and Associated Treatments have** the potential to effect historic properties. Protection measures, including avoidance where necessary, will be necessary to eliminate or minimize adverse effects.
- **Herbicide –** Herbicide use has limited-to-no potential to adversely affect historic properties.
- **Prescribed fire** activities have no adverse effect to historic property when natural or existing fire barriers, such as streams, ridges, roads and trails are used for fire control lines. Fire control barriers requiring ground disturbance will not occur where historic properties have been identified. Non-ground disturbing methods, such as hand line, wet line or black line would have no adverse effect to historic property.
- **Road Maintenance** activities have no adverse effect to historic property where work is confined to previously maintained surfaces, ditches, culverts, and cut and fill slopes where there are no known historic properties because proposed work is clearly within disturbed context. None of the culverts to be replaced are historic property.

  Temporary Roads have the potential to effect historic properties. Protection measures, including avoidance where necessary, would be necessary to eliminate or minimize adverse effects.
- **Non-Native Invasive Species Treatments** such as hand-pulling, mowing, grubbing, biological control, and herbicide application have limited-to-no potential to adversely affect historic properties.

CUMULATIVE EFFECTS TO HISTORIC PROPERTY FROM PROPOSED PROJECT ACTIVITIES:

The potential for direct and indirect effects to historic property is negligible. As such this action would have no cumulative effect to historic property.

CONSISTENCY WITH THE FOREST PLAN

Forest Goal HR01 provides for the identification and management of cultural resources on the Forest, as does direction in Heritage Resources Standards HR04, HR05.

CONSISTENCY WITH LAWS, REGULATIONS, HANDBOOKS AND EXECUTIVE ORDERS

Executive Order 11593, promulgated in 1971, instructs that all archaeological resources on Federal land are to be evaluated, while the 1988 amendment to the Archaeological Resources Protection Act (16 USC 470 mm) instructs federal land-managing agencies to develop and implement a plan for archaeological survey and evaluation. Provided that National Register eligible sites are avoided or mitigated, and unevaluated sites are avoided or evaluated, and appropriate management taken, then any of the Alternatives is consistent with the Forest Plan and legal statute.

RELEVANT LAWS, REGULATIONS AND AUTHORITIES

Antiquities Act of 1906 (16 USC 431-433)
Historic Sites Act of 1935 (16 USC 461-467)
National Historic Preservation Act of 1966 (16 USC 470)
National Environmental Policy Act (42 USC 4321-4347)
Archaeological Resources Protection Act of 1979 (16 USC 470)
Archaeological and Historic Conservation Act of 1974 (16 USC 469)
Executive Order 11593
FSM 2361

SUPPORTING PROJECT DOCUMENTATION

Table 10: Applicable Project File Documentation to Support NHPA Compliance

Documentation Type	Location

Commented [CT-7]: Jon – please ensure that Gavin provides us the SHPO/tribal consultation letters for the record and to reference here, when they are available

Commented [TAS-8]: Placeholder to add compliance documentation.

TRIBAL CONSULTATION

Based on the nature of the proposal, the line officer/responsible official made the following determination regarding Tribal Consultation:

Consultation with native American tribes is being conducted, as required.

Commented [TAS-9]: I **need Gavin to make up this wording**, like the above or perhaps something like The line officer has determined that consultation with Native American tribes is enough for this project…

COMMENTS

All surveys will be conducted in consultation with the West Virginia Division of Culture and History (WVDCH), the Absentee Shawnee Tribe of Oklahoma, the Eastern Shawnee, the Shawnee Tribe, the Delaware Nation, and the Seneca Nation. The resulting technical report will be reviewed by all consulting partners prior to implementation of ground disturbing activities. Protection measures, including avoidance, will be established for all historic properties identified to avoid adverse effects.

List Tribes, dates of consultation and outcome – or refer to other project file documentation (listed in the table below)

SUPPORTING PROJECT DOCUMENTATION

Table 11: Applicable Project File Documentation to Support Tribal Consultation Compliance

Documentation Type	File Name(s)

Commented [TAS-10]: Placeholder to add tribal compliance documentation

SPECIAL MANAGEMENT AREAS

The pertinent specialist has reviewed the proposal and made the following determinations based on special management area presence/proximity or lack of:

Table 12: Special Management Area Compliance Determinations

Management Area Type	Applicable Law/Regulation to Demonstrate Compliance With	Rationale for Compliance or Needs for Proposal Modification
Yellow Popular Candidate Research Natural Area	Monongahela National Forest Land and Resource Management Plan	No project activities would not occur in the Yellow Popular Candidate Research Natural Area.
Cranberry Glades National Natural Landmark and Botanical Area	Monongahela National Forest Land and Resource Management Plan	No project activities would not occur in the Cranberry Glades National Natural Landmark and Botanical Area.
Wild and Scenic Rivers	Monongahela National Forest Wild and Scenic River Study Report The National Wild and Scenic Rivers Act of 1968.	Project actions fall within WSR corridor. NFLMP Standard WS03 states: When management actions are proposed that may compromise the outstandingly remarkable value, classification, or free-flowing character of an eligible Wild and Scenic River segment, a suitability study shall be completed for that eligible river segment prior to initiating the actions.

The GHFR project area includes 5.9 miles of the North Fork of the Cherry River, however only 3.9 miles overlap with the project. The Wild and Scenic River Study completed by the Monongahela National Forest in 1995 identified a 10.8-mile segment of the North Fork of the Cherry River as an eligible wild and scenic river. The classification was for a recreational river segment with outstandingly remarkable values (ORV) of scenery and recreation. This segment is listed as eligible for possible inclusion into the wild and scenic river system at a future point. Management actions that retain the free-flowing condition, the highest classification potential, and the outstandingly remarkable values are consistent with the eligible designation. The following table from the Monongahela National Forest Land and Resource Plan p. III-6 identifies the ORVs for each segment of eligible WSR within MP 3.0.

Table 13. Eligible Wild and Scenic River Segments in MP 3.0

Eligible Wild and Scenic River Segments in MP 3.0			
River Name	**Classification**	**Outstandingly Remarkable Values**	**Miles**
North Fork Cherry River	Recreational	Scenery, Recreation	10.8
Glady Fork	Recreational	Recreation	2.8
Laurel Fork	Scenic	Recreation	4.4

Williams River	Recreational	Scenery, Recreation	7.3

DIRECTION RELATED TO MANAGEMENT ALONG ELIGIBLE WSR SEGMENTS:

For eligible recreational river designations, some management actions may be approved within the one-quarter mile on either side of the eligible river segment. For vegetation management within Scenic and Recreational classifications, the Forest Service Handbook 1909.12 chapter 80, Wild and Scenic Rivers, states that a range of vegetation management and timber harvest practices are allowed, if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character and prescribed fire and wildfires managed to meet resource objectives may be used to restore or maintain habitat for threatened, endangered, or sensitive species or restore the natural range of variability.

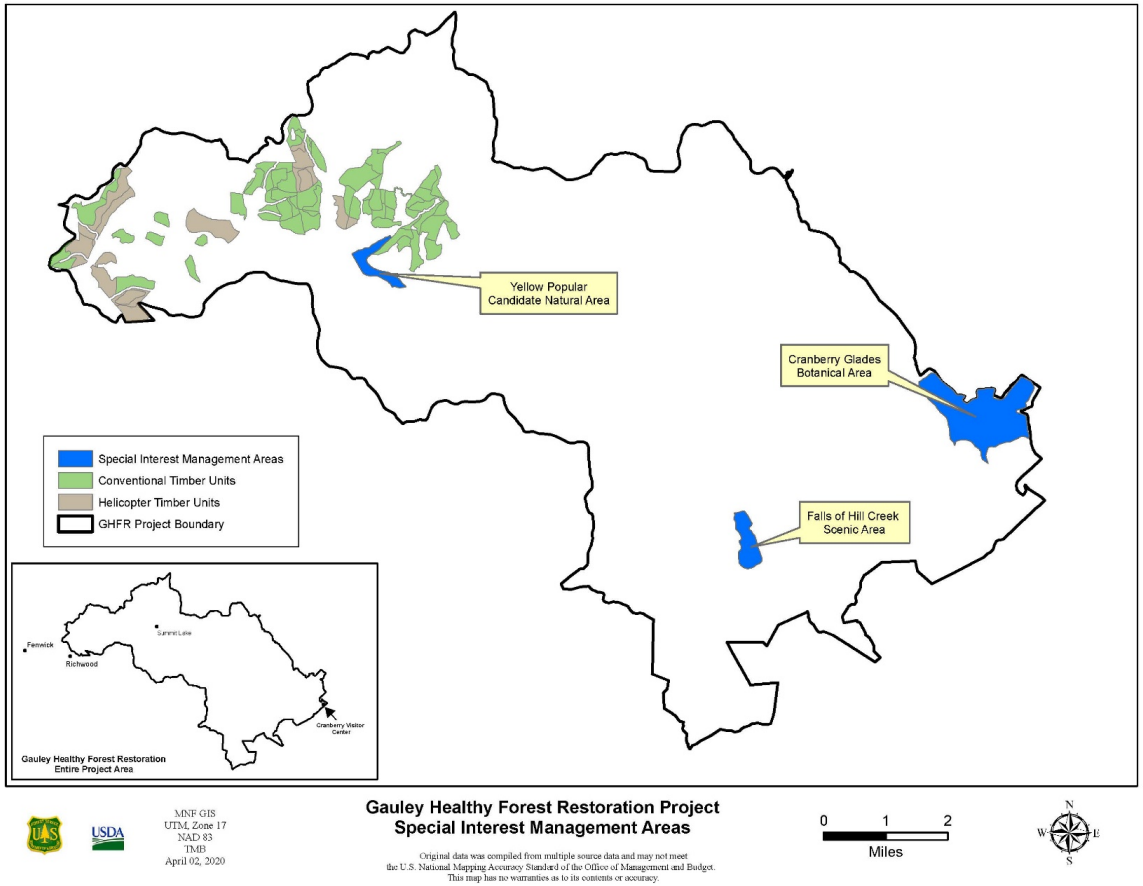

Figure 3. Special Interest Management Areas

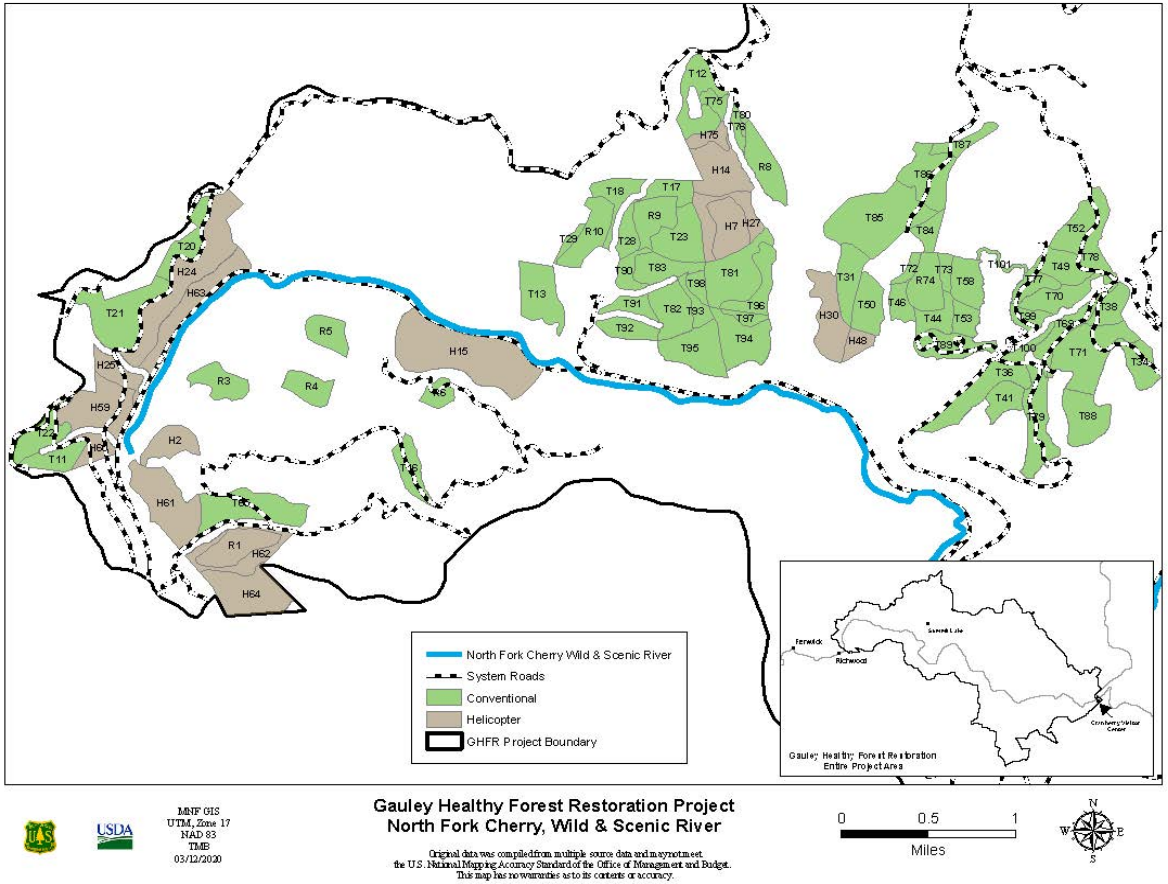

Figure 4. North Fork Cherry Wild and Scenic River

WILD AND SCENIC RIVERS

DESCRIPTION OF EFFECTS TO ELIGIBLE WSR SEGMENT FROM GHFRA PROJECT:

The project proposes vegetation thinning actions along 2.2 miles and prescribed fire along 1.7 miles of the eligible segment of the North Fork Cherry River. The thinning and prescribed fire activities will result in healthy forest stands more resilient to insects, disease, and weather disturbances. Therefore, improving the scenic and recreational values of the river. Impacts may be seen by visitors during implementation of treatments. However, these are expected to be short in duration, likely only one growing season. A more resilient forest maintains scenic values and safety. Large scale die-offs or damage to the vegetation will be less likely following these treatment actions. Overall, the project is not expected to have any measurable or lasting impacts on the ORV of scenery and recreation for this river segment.

SUPPORTING PROJECT DOCUMENTATION

Table 14: Applicable Project File Documentation to Support Special Management Area Compliance

Documentation Type	Location
Recreation and Scenery Report	Recreation_Scenery_Report
Scenery Management System Matrix	Scenery_Management_System_Matrix

CLEAN AIR ACT (CAA)

The pertinent specialist has reviewed the proposal and made the following determinations regarding the CAA:

The potential for effects to air quality is minimal from prescribed fire operations. There are no non-attainment areas in the project area and reasonable progress goals are being met for the nearby Class I areas. As such, the project is unlikely to cause any violations of the Clean Air Act.

SUPPORTING PROJECT DOCUMENTATION

Table 15: Applicable Project File Documentation to Support CAA Compliance

Documentation Type	File Name(s)
Air Quality Report	Air_Quality_Report

CLEAN WATER ACT (CWA)

The pertinent specialist has reviewed the proposal and made the following determination:

Mitigating the risk of sedimentation into water bodies is consistent with SW23, SW34, SW51, and WF14. By meeting these forest plan standards, maintenance or improvement of relevant Watershed Condition Indicators (WCI) and compliance with State water quality directives and the Clean Water Act is demonstrated.

SUPPORTING PROJECT DOCUMENTATION

Table 16: Applicable Project File Documentation to Support CWA Compliance

Documentation Type	File Name(s)
Hydrology Report	Hydrology_Report

PERTINENT EXECUTIVE ORDERS

The line officer and/or applicable specialist(s) have determined the proposal is in compliance with the following Executive Orders (EO), which were deemed pertinent based on the nature of the proposal.

EO 13186, Migratory Birds: In general, effects to migratory birds from the proposed actions have been minimized by considering the timing of activities to minimize disturbances during the breeding season; retaining snags for nesting structures; and retaining the integrity of breeding sites. Proposed vegetation management actions have been developed to shift macro-vegetative structure (tree size class, tree species composition, or tree canopy cover) toward desired conditions representative of the HRV of those plant communities. In addition to retaining the integrity of breeding sites, these activities are expected to continue to provide for migration routes and stopover habitat.

Proposed actions comply with the Migratory Bird Treaty Act but may result in an "unintentional take" of individuals during proposed actions. However, this project complies with the U.S. Fish and Wildlife Service (USFWS) Director's Order 131 related to the applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits for "take". In addition, this project complies with Executive Order (EO) 13186.

EO 12898, Environmental Justice: The transparent, non-exclusive collaborative process used to develop this project, as well as consultation with Native American tribes, ensured fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. No environmental justice issues were identified for this project, as it is not expected to lead to disproportionately high and adverse impacts on minority or low-income populations.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) – CONSIDERATION OF EXTRAORDINARY CIRCUMSTANCES

Pertinent specialists have reviewed the proposed action and made the following determinations with regards to degree of potential effects for the resource conditions considered:

Table 17. Resource Conditions Considered for Extraordinary Circumstance Determinations

Resources Conditions Considered for Extraordinary Circumstances	Is there a degree of potential effect that raises uncertainty over its significance? Briefly explain.
Federally listed threatened or endangered species, **Designated critical habitat,** **Forest Service sensitive species**	**BOTANY:** NO, there is no uncertainty **Rationale:** Refer to the Biological Assessment and Biological Opinion for species specific discussion. **FISHERIES:** NO, there is no uncertainty **Rationale:** Refer to the Biological Assessment and Biological Opinion for species specific discussion. **WILDLIFE:** NO, there is no uncertainty **Rationale:** Refer to the Biological Assessment and Biological Opinion for species specific discussion.
Floodplains, wetlands or municipal watersheds	NO, there is no uncertainty **Rationale:** The project is not expected to negatively affect a floodplain or wetland. The project is in compliance with Executive

Resources Conditions Considered for Extraordinary Circumstances	Is there a degree of potential effect that raises uncertainty over its significance? Briefly explain.
	Orders 11988 (floodplains) and 11990 (wetlands). Project is not in a municipal watershed.
Congressionally designated areas, such as wilderness, wilderness study areas, or national recreation areas	N/A, not present
Inventoried roadless areas	N/A, not present
Research natural areas	N/A, not present
American Indians and Alaska Native religious or cultural sites	NO, there is no uncertainty **Rationale:** Section 106 Review has been completed and National Register eligible cultural sites are located within the project area. Modifications can avoid/protect cultural resources
Archaeological sites, or historic properties or areas	NO, there is no uncertainty **Rationale:** Protection measures established during consultation will eliminate or minimize direct and indirect effects to historic property. All historic properties identified would be marked and avoided during all phases of project implementation. Ground disturbing activities shall be prohibited within marked boundaries of historic properties.

SUPPORTING PROJECT DOCUMENTATION

Table 18. Additional Project File Documentation to Support finding of no extraordinary circumstances

Documentation Type	File Name(s)

Table 19. Additional Project Documentation

Documentation Type	File Name(s)

DECISION MEMO

Gauley Healthy Forest Restoration Project

U.S. Forest Service

Gauley Ranger District, Monongahela National Forest

Greenbrier, Nicholas, Pocahontas, Webster Counties, West Virginia

This decision incorporates all information in this document and included in the project file.

DECISION & RATIONALE

I have decided to authorize the activities described in the Proposal section, to include any modifications identified during environmental analysis and review of regulatory compliance.

I have determined the actions proposed will address the purpose and need and move treatment areas toward desired conditions, as described in the Proposal section.

APPLICABLE CATEGORICAL EXCLUSION & FINDINGS REQUIRED BY OTHER LAWS

The Proposal Information section provides rationale for categorically excluding this action from documentation in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) and for using the identified category. The Environmental Analysis Review section documents rationale to support my finding that no extraordinary circumstances exist, along with findings required by other applicable laws and regulations to demonstrate compliance with the regulatory framework for the activities authorized by this decision.

AGENCIES, ORGANIZATIONS & PERSONS CONTACTED

A description of agencies, organizations, and/or persons contacted regarding this proposal is provided in the Agencies, Organizations & Persons to be Contacted, along with a brief overview of comments/feedback received and how they were considered.

IMPLEMENTATION DATE

I intend to implement this decision beginning in X 2021.

Commented [SD-FS11]: Review date

ADMINISTRATIVE REVIEW

Decisions that are categorically excluded from documentation are not subject to an administrative review process (Agriculture Act of 2014 [Pub. L. No. 113-79], Subtitle A, Sec. 8006).

CONTACT

For additional information concerning this decision, contact: Tami Conner, Ecosystem Staff Officer, Supervisor's Office, 200 Sycamore Street, Elkins, WV, 26241, tami.conner @usda.gov.

Commented [SD-FS12]: Who should be listed?

/s/ Date

Richard P. Raione

District Ranger

United States
Department of
Agriculture

Forest
Service

Monongahela
National
Forest

Gauley
Ranger
District

Gauley Healthy Forest Restoration – Biological Evaluation

Regional Forester Sensitive Species (RFSS), Management Indicator Species (MIS), and Birds of Conservation Concern (BCC)

February 2021

Introduction

This document is intended to provide the Gauley District Ranger with project-specific information identifying effects of actions proposed in the Gauley Healthy Forests Restoration Project on Regional Forester Sensitive Species (RFSS), Birds of Conservation Concern (BCC), and Management Indicator Species (MIS). The 2006 Monongahela National Forest Land Management Plan (Forest Plan) identified the following desired condition regarding wildlife and fish: 1.) The amount, distribution, and characteristics of habitat are present at levels necessary to maintain viable populations of native and desired non-native wildlife and fish species, 2.) For Regional Forester Sensitive Species (RFSS), management actions do not contribute to a trend toward federal listing, 3.) Human activities do not prevent populations from sustaining desired distribution and abundance, especially during critical life stages, and 4.) Habitat conditions support populations of species of ecological, socio-economic, cultural, and recreational significance. This project has been planned to incorporate all applicable Forest Plan standards and guidelines as they pertain to RFSS, MIS, and BCC.

Proposed Action

The Gauley Ranger District of the Monongahela National Forest proposes to conduct hazardous fuels reduction and insect/disease activities on 2,984 acres of the 48,000-acre project boundary. The project area is adjacent to and east of Richwood, WV. It extends eastward to the Cranberry Mountain Nature Center. West Virginia Route 39/55 bisects the project area. The northern boundary of the project area is made up of County road 7/2, Forest Road 99, and the Cranberry River. Private lands form the southern edge of the project area. The project area is managed under Forest Plan management prescriptions 3.0 and 4.1. Possible treatments include the construction of temporary roads (with associated decommissioning) and the upgrade and maintenance of existing designated roads, the construction of fuel breaks, the use of herbicides, insecticides, and pheromones, the use of pesticides, the application of prescribed fire, timber harvesting, including salvage (commercial sale), mastication, mowing, thinning, clear-cut or other thinning methods.

Scope of the Analysis

For direct and indirect effects, the spatial boundary of the analysis is the Richwood Wildland Urban Interface (WUI) boundary (see Gauley Healthy Forest Restoration Project Helicopter & Ground Based Logging Plan map in CE Review). The Richwood WUI boundary includes all parcels of land that would be affected by project activities; therefore, it is an appropriate boundary for the analysis of direct and indirect effects on RFSS, MIS, and BCC. The Richwood WUI boundary encompasses approximately 7029 acres, which includes 7028 acres of National Forest land and one acre of private land. For cumulative effects, the spatial boundary of the analysis is the Proclamation and Purchase Unit boundary for the Monongahela National Forest. This is the boundary to which the National Forest Management Act's species diversity and viability requirements apply.

The temporal boundary for direct and indirect effects on RFSS, MIS, and BCC is 120 years from the beginning of project implementation. This is the time frame within which effects to forested habitat will persist. While effects to each individual species may not persist that long, successional changes set in motion by regeneration harvesting will continue for at least that long, potentially affecting some species that occur in forested habitats. This temporal boundary is also used for the cumulative effects' analysis because the contribution to cumulative effects ends when the direct and indirect effects (positive or negative) no longer exist. The project is expected to be implemented for up to a 10-year period after a decision is signed. Therefore, the direct/indirect effects discussed will not occur across the WUI all at once but over a 10-year period.

Summary of Affected Environment – Regional Forester's Sensitive Species Wildlife Species, Birds Conservation Concern, and Management Indicator Species.

Fifty-seven wildlife species (terrestrial amphibians, reptiles, birds, mammals, and insects) are RFSS, BCC, or MIS on the Monongahela National Forest. Based on field surveys and existing records, 11 species are known to occur in the project area. Of these 11 species 10 are RFSS, 1 is a BCC, and none are MIS. Other species included in this analysis have assumed presence based on the habitat present in the project area.

The effects of the proposed action for RFSS, BCC, and MIS are discussed in the next section. This analysis will be assessed by habitat type and detail how the species within each habitat type would be affected by the proposed action. Not all proposed actions will take place in every habitat type, therefore if an action is not mentioned there are no effects under that habitat type. No further analysis is necessary for species that are not known or suspected to occur in the project area and for which no suitable habitat is present.

Affected Environment and Environmental Effects of Rocky Outcrop Habitat

Condition of Resource: Dry rocky habitat includes dry rock outcrops and ledges that occur at various elevations along ridge tops and side slopes, whereas moist rocky habitat includes the wet outcrops and moist colluvial rubble that occur along streams and in cove bottoms. The analysis area has the potential to contain patches of both types of habitat. Some overlap among the habitat types occurs. For example, mesic forests, wetland/riparian habitat, and moist rocky habitat co-occur in the deep, narrow coves. This habitat is managed as a unique ecosystem type.

Environmental Effects of Prescribed Fire: The proposed action does not anticipate significant impacts to wildlife species associated with rocky outcrop habitat. Prescribed fire would impact 8 acres of rock features within the WUI. Prescribed fire would not carry in a uniform fashion, due to the nature of the habitat. Fire would carry in cracks and ledges where leaf litter has accumulated in a meandering pattern. There are short term effects associated wildlife where animals could potentially be displaced. The sensitive species associated with this habitat type utilize the rocky outcrop habitat for burrowing and the behavior of these species suggest it would

easily avoid harm. Fire is a natural component to this ecosystem and would have positive long-term effects.

Environmental Effects of Fuels Breaks: Rock outcrop habitat is a natural fire barrier therefore, management to maintain fuel breaks that include rock outcrop features would be minimal. Fuel breaks would affect 0.6 acres of rock features. Based on the scope and scale of this activity it would not lead to population viability concerns for any of these species.

Environmental Effects of Temp Roads: The proposed action does not anticipate a significant impact to associated wildlife. Temp roads would affect 0.1 acres of rocky habitat.

Environmental Effects of Timber Harvesting Activities: Project implementation would not lead to long term negative impacts to rocky habitat or the species that utilize this habitat. There are 54 acres of rock features within the WUI and the proposed timber actions have the potential to affect 27 acres of those rock features. Areas that are determined significant during habitat assessments and surveys would have mitigation measures in place during project implementation.

Mitigation Measures: Habitat assessments would be conducted before the implementation of proposed actions for rattlesnake and green salamander. Based on habitat conditions, surveys would be conducted as needed. Based on survey results of detections, mitigation measures would be established accordingly. Mitigation measures can include establishing protective areas, on-site monitoring, modifying timber prescriptions, pre/post monitoring, corridors, establishing prescribed fire perimeters, etc. The mitigation measures established for green salamanders and timber rattlesnakes in the forest implementation plan would assist in managing other species associated with rock outcrops.

Species Effected:

Common/Scientific Name	**Presence**	**Determination No Impacts, Beneficial, *MII, or *MCT**	**Effects of the proposed action**
Allegheny woodrat/*Neotoma magister*	Existing Element Occurrence within project boundary	MII	Habitat disturbed; abundant suitable habitat persists within Project Area.
Long-tailed shrew/*Sorex dispar*	Presumed Presence within project area	MII	Habitat disturbed; abundant suitable habitat persists within Project Area
Southern rock vole/*Microtus chrotorrhinus*	Existing Element Occurrence within WUI	MII	Habitat disturbed; abundant suitable habitat persists within project area
Timber Rattlesnake/*Crotalus horridus*	Existing Element Occurrence within WUI	MII	Habitat disturbed; abundant suitable habitat persists within project area
Green Salamander/*Aneides aeneus*	Existing Element Occurrence within WUI	MII	Habitat disturbed; abundant suitable habitat persists within project area

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Affected Environment and Environmental Effects of Riparian Habitat

Condition of Resource: Riparian habitat is the interface between land and a river or stream. Currently, most of the riparian areas are mid-late succession hardwood forest. Riparian habitat presently makes up 1157.2 acres of the WUI and 3042 acres of the project boundary.

Environmental Effects of Prescribed Fire: Prescribed fire would impact 18.9 of the 1157.2 acres of riparian habitat within the WUI. The prescribed fire would be low to moderate intensity to reduce leaf litter while maintaining fire adapted overstory. Rivers and streams would be used as natural fire breaks to limit the impact on the land from handline fire breaks.

Environmental Effects of Fuels Breaks: Fuel breaks would affect 7.4 acres of riparian habitat. Fuel breaks will consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees within 100 feet of private property or Forest Service infrastructure. This proposed action would not lead to long term negative impacts to riparian habitat or the species that utilize this habitat.

Mitigation Measures: Forest Service must comply with all forest standards and guidelines in the Monongahela National Forest Plan (September 2006). Riparian habitat would be protected through Forest Plan standards and guidelines, specifically SW34 and SW37. The bald eagle has other protection measures listed in the forest plan (WF15, W25, W26, and W27). Effects on the Southern water shrew, mud salamander, Appalachian tiger beetle, and green-faced club tail would be mitigated with the use of best management practices. The northern waterthrush, Louisiana waterthrush, and bald eagle also use riparian habitat for nesting and foraging therefore the use of stream buffers would also protect those species.

Species Effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
Northern Waterthrush/*Parkesia noveboracensis*	Existing Element Occurrence within project boundary	MII	Suitable habitat remains. Habitat protected by riparian buffers.
Louisiana Waterthrush/*Parkesia motacilla*	Presumed Presence within project area	MII	Suitable habitat remains. Habitat protected by riparian buffers.
Bald Eagle/*Haliaeetus leucocephalus*	Existing Element Occurrence within WUI	MII	Suitable habitat remains. Habitat protected by riparian buffers.
Southern Water Shrew/*Neomys anomalus*	Presumed Presence within project area	MII	Suitable habitat remains. Habitat protected by riparian buffers.
Mud salamander/*Pseudotriton montanus*	Available habitat within project area	No impacts	Suitable habitat remains. Habitat protected by riparian buffers.
Appalachian tiger beetle/*Cicindela ancocisconensis*	Available habitat within project area	No impacts	Suitable habitat remains. Habitat protected by riparian buffers.

Green-Faced Clubtail/*Gomphus viridifrons*	Existing Element Occurrence within project boundary	MII	Suitable habitat remains. Habitat protected by riparian buffers.

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Affected Environment and Environmental Effects of Wetland Habitat

Condition of Resource: Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are classified by saturated soils, plants associated with saturated soil condition, and hydric soils. Marshes, ponds, the edge of a lake or ocean, the delta at the mouth of a river, bogs, and low-lying areas that frequently flood are all wetlands. This habitat type makes up 30.5 acres of the WUI and 3042 acres of the project area. There would be no impact on the southern bog lemming since there are no proposed actions that would impact open grassy areas or boggy meadows.

Species effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
Southern bog lemming/*Synaptomys cooperi*	Available habitat within project area	No impacts	Negligible portion of suitable habitat impacted.

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Mitigation Measures: Wetland habitat would be protected through Forest Plan standards and guidelines, specifically SW51.

Affected Environment and Environmental Effects of Roadside and Wildlife Opening Habitat

Condition of the Resource: Roadsides and wildlife openings are habitats associated with strips, along linear features, log landings, and general openings with ground vegetation. Typical vegetation being managed is forbs and grasses. Wildlife openings are maintained to meet various foods or cover needs for wildlife. Currently there are 350 acres of roadsides and 7.3 acres of wildlife openings. These proposed actions would create more of this habitat type and benefit the species that use this habitat.

Environmental Effects of Prescribed Fire: The prescribed burn activities would create open habitat for more forbs to grow and create pollinator foraging habitat.

Environmental Effects of Fuels Breaks: Fuel breaks would consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees within 100 feet of private property or Forest Service infrastructure. This action would create open habitat for more forbs to grow and create pollinator foraging habitat.

Environment Effects of Temp Roads: After the timber activities are complete, the skid trails and log landings would be re-seeded with a native pollinator seed mix.

Environmental Effects of Timber Harvesting Activities: The regeneration harvest activities would create open habitat for more forbs to grow and create pollinator foraging habitat.

Mitigation Measures: Log landings would be back bladed and leveled to ensure positive drainage, then seeded. Skid trails would be decommissioned by making dips or water bars, then seeded. (RF12 and TR10)

Species Effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
Monarch Butterfly/*Danaus plexippus*	Existing Element Occurrence within WUI	Beneficial	Habitat within project area improved/expanded
Early Hairstreak/*Erora laeta*, A Noctuid Moth/*Hadena ectypa*, Bronze Copper/*Lycaena hyllus*, West Virginia White/*Pieris virginiensis*, Smyth's Green Comma/*Polygonia faunus smythi*, Diana Fritillary/*Speyeria diana*	Existing Element Occurrence within project boundary	MII, Beneficial	Habitat within project area improved/expanded

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Affected Environment and Environmental Effects of Deciduous Forest Habitat

Condition of the Resource: Deciduous forest are found in temperate zones and are made up of mainly hardwood trees. Mid and mid-late succession hardwood forests are the focus of the proposed action. The 7028-acre WUI is mostly mid-late succession with 374.5 acres of mid successional, 102 acres of early successional, and 3.3 acres of late successional habitat. The proposed actions would benefit many species by creating a more heterogeneous landscape.

Environmental Effects of Prescribed Fire: Prescribed fire would impact 350.5 acres of deciduous habitat. Prescribed fire understory burns may have negative impacts in the short term, especially for the ground-nesting whip-poor-will, worm-eating warbler, and Kentucky warbler but benefit these species in long term depending on the intensity of the fire. Similarly, the mountain earth snake would benefit from the proposed actions. Prescribed fires could be an excellent management tool to help restore open-canopy habitat and provide more habitat for the mountain earth snake. In the short-term, prescribed fire may impact breeding individuals of yellow-bellied sapsucker and roosting individuals of eastern small-footed bat, little brown bat, and tri-colored bat with indirect smoke impacts. Mitigation measures for smoke management are recommended during nesting and roosting season. The Nashville warbler breeds in second-growth or forest edge with a high percentage of shrub cover. It also breeds in open deciduous and

conifer woodland, cutover, or burned areas. Prescribed fire would likely have a beneficial effect on breeding habitat by increasing available shrub cover.

Environmental Effects to Fuels Breaks: There would be 59.7 acres of deciduous forest habitat impacted by fuel breaks. Fuel breaks would consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees within 100 feet of private property or Forest Service infrastructure. Slash created from harvest operation would be mechanically or hand piled and burned or pulled away from private property or Forest Service infrastructure by the contractor approximately 100 feet from property boundary. Fuel breaks would be created and maintained by using chainsaws, prescribed fire, and/or mowing. This activity would be beneficial to some wildlife species (Black-capped chickadee, Nashville warbler, wild turkey, Eastern small-footed bat, little brown bat, and tri-colored bat) by creating more heterogeneous habitat and wildlife corridors.

Environmental Effects to Temp Roads: Temp roads would affect 87 acres of deciduous forest habitat. Temp Roads would be decommissioned within three years after project completion. The proposed action does not anticipate a significant impact to sensitive wildlife.

Environmental Effects of Timber Harvesting Activities: Timber activities would impact 2,664 of the 6,207 acres of deciduous habitat within the WUI. For the whip-poor-will regeneration harvest would negatively affect their habitat type, which consists of deciduous or mixed forests with little or no underbrush. Worm-eating warbler and wood thrush are interior forest birds therefore, regeneration harvest would have a negative impact due to the reduction of forest interior. The cerulean warbler would likely benefit from thinning and burning activities that promote oak forest with old-growth characteristics (e.g. shelter-wood type harvest and thinning with large diameter trees remaining). Though, harvest activities (e.g. regeneration harvest) that reduce the availability of large trees and reduce forest with old-growth characteristics would have a negative impact on the species. Kentucky warbler breeding habitat consists of a mature canopy with a thick understory. Thinning activities that promote a shrubby understory would likely benefit the species. Clear-cut activities may reduce available habitat as they prefer large tracts of intact forest. However, based on the scope and scale of these activities it would not lead to population viability concerns for any of these species.

Maintenance of early successional woody habitat within the MNF is vital for the Appalachian cottontail and eastern spotted skunk. These species prefer early successional forests with structural diversity, dense understory, and dense overhead cover. Regeneration harvesting prescriptions would have beneficial effects for the species. Prescribed fire has the potential to improve high-elevation areas by providing them with a more heterogeneous, early successional habitat. Additionally, the dense understory is extremely important to these species for concealment and thermal cover and would add additional benefit to both species. The proposed action would promote diversity and it is not anticipated to have significant adverse impacts that would lead to their listing. Harvest would also increase available breeding habitat, early successional forest, for the yellow-bellied sapsucker overtime. Timber harvest may disturb mountain earth snake individuals initially but could be beneficial long-term by creating more heterogeneous habitat, opening canopies, and providing more open fields for mountain earth snakes.

Black-capped chickadee and wild turkey would likely benefit from harvest activities that increase edge habitat and open areas. Many of the activities proposed would benefit these species by creating open areas for foraging and promoting oak/hickory composition through prescribed fire. The Nashville warbler breeds in second-growth or forest edge with a high percentage of shrub cover. Timber harvest would likely have a beneficial effect on breeding habitat by increasing available shrub cover. The proposed activities would also benefit the northern goshawk and long-eared owl since they promote shrub-lands and forest openings. The Forest Service does not anticipate adverse effects to the RFSS-listed bat species (Eastern small-footed bat, little brown bat, and tri-colored bat). There are no known hibernacula in the project area, and harvesting is not expected to occur during the winter hibernation period. Snags and other possible roosting habitats would be removed in the immediate area during logging operations, potentially killing, or displacing actively roosting individuals. However, based on the scope and scale of these activities it would not lead to population viability concerns for these species. Remaining potential roost trees left as residuals, created roost tree habitat (conservation measure), or at the newly created forest edge would benefit roosting potential. The little brown myotis is known to also roost in rocks. If present, these features would increase roosting potential. Insect prey for these species should be increased with the flush of herbaceous regrowth. There is the potential for indirect effects, which may include noise and smoke from operations, but it is hard to anticipate the effects or the magnitude of them if any. No indirect effects are anticipated. Known active maternity roost would be protected from mortality. No maternity colonies are known in the project area, but all species are known to occur.

Mitigation Measures: The forest would perform surveys before implementing the proposed action and if active raptor nests are found within the project area the forest would implement Standard WF15.

Species Effected:

Common/Scientific Name	**Presence**	**Determination No Impacts, Beneficial, *MII, or *MCT**	**Effects of the proposed action**
Eastern Small-footed Bat/*Myotis leibii*	Presumed Presence within project area	MII	Habitat disturbed; abundant suitable habitat persists within Project Area
Little Brown Bat/*Myotis lucifugus*	Presumed Presence within project area	MII	Habitat disturbed; abundant suitable habitat persists within Project Area
Tri-colored Bat/*Perimyotis subflavus*	Presumed Presence within project area	MII	Habitat disturbed; abundant suitable habitat persists within Project Area
Appalachian Cottontail/*Sylvilagus obscurus*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded
Eastern Spotted Skunk/*Spilogale putorius*	Presumed Presence within project area	MII	Habitat within project area improved/expanded
Cerulean warbler/*Setophaga cerulea*	Presumed Presence within project area	MII, Beneficial	Habitat disturbed within project area, but remaining habitat improved.
Kentucky warbler/*Geothlypis formosa*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded

Yellow-bellied sapsucker/*Sphyrapicus varius*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded
Black-capped chickadee/*Poecile atricapillus*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded
Worm-eating warbler/*Helmitheros vermivorum*	Presumed Presence within project area	MII	Habitat disturbed; suitable habitat persists within project area
Wild turkey/*Meleagris gallopavo*	Presumed Presence within project area	MII, Beneficial	Habitat disturbed within project area, but remaining habitat improved.
Whip-poor-will/*Antrostomus vociferus*	Presumed Presence within project area	MII	Based on the scope and scale of this activity population viability would not be a concern.
Wood thrush/*Hylocichla mustelina*	Presumed Presence within project area	MII	Based on the scope and scale of this activity, population viability would not be a concern.
Mountain Earth Snake/*Haldea striatula*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded
Nashville warbler/*Leiothlypis ruficapilla*	Existing Element Occurrence within project boundary	MII, Beneficial	Habitat within project area improved/expanded
Northern Goshawk/*Accipiter gentilis*	Existing Element Occurrence within project boundary	MII	Sustain suitable habitat present
Long-eared owl/*Asio otus*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Affected Environment and Environmental Effects of Mixed Oak-Pine Forest Habitat

Condition of the Resource –The timber activities proposed for this project would specifically be targeting hardwood stands so habitats with a conifer component would have limited impacts. The species found in this habitat type include the Northern saw-whet owl, red crossbill, and Canada warbler. These species are found in mature evergreen or mixed conifer forests. The closest habitat to that in the project area would be mixed oak/pine forests which makeup 354.7 acres within the timber units, 539.8 acres of habitat within the WUI, and 1453.1 acres within the project boundary.

Species Effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
Northern saw-whet owl/*Aegolius acadicus*	Presumed Presence within project area	MII	Habitat minimally impacted.
Red Crossbill/*Loxia curvirostra*	Presumed Presence within project area	No impacts	Habitat minimally impacted.
Canada warbler/*Cardellina canadensis*	Presumed Presence within project area	MII	Based on the scope and scale of this activity population viability would not be a concern.

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Mitigation Measures: Forest Service must comply with all forest standards and guidelines in the Monongahela National Forest Plan (September 2006).

Affected Environment and Environmental Effects of Red Spruce Habitat

Condition of the Resource: No red spruce habitat would be removed or altered by the proposed action and the West Virginia northern flying squirrel is not present in the project area, so the proposed action would have no effect.

Species Effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
West Virginia Northern Flying Squirrel/*Glaucomys sabrinus fuscus*	Available habitat within project area	No Impacts (if edge habitat is delineated)	Appropriate mitigation measures would be established, if units of potential habitat are determined prior to implementation activities.

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Mitigation Measures: The Forest Service must comply with all forest standards and guidelines in the Monongahela National Forest Plan (September 2006).

Affected Environment and Environmental Effects of Shrubland Habitat

Condition of Resource: Currently, there is no shrubland habitat within the project area and the regeneration harvest timber activity and prescribed burns would be creating this habitat. The prairie warbler, golden-winged warbler, and blue-winged warbler would benefit from the proposed activities.

Species Effected:

Common/Scientific Name	Presence	Determination No Impacts, Beneficial, *MII, or *MCT	Effects of the proposed action
Prairie warbler/*Setophaga discolor*, Golden-winged warbler/*Vermivora chrysoptera*, Blue-winged warbler/*Vermivora cyanoptera*	Presumed Presence within project area	MII, Beneficial	Habitat within project area improved/expanded

*MII = May impact individuals but not likely to cause a trend toward federal listing; MCT = May impact individuals and likely to cause a trend toward federal listing.

Mitigation Measures: The Forest Service must comply with all forest standards and guidelines in the Monongahela National Forest Plan (September 2006).

Cumulative Impacts for Affected Environment of all Habitat Types

Cumulative impacts to all habitat types associated with the proposed action can result from the effects of past, present, or other future reasonably foreseeable land management practices. Long term the effects of the proposed project would improve habitat, reduce wildfire risk, promote seedling recruitment, promote healthy habitat and wildlife, and promote abundance in wildlife and associated habitats. The reduction in fuel loads would lower the wildfire risk and associated habitat long term.

Summary of Environmental Effect Determinations for RFSS, BCC, and MIS

The Proposed Action could affect any undiscovered occurrences. However, as discussed above, such losses would not be expected to impact population viability within the analysis area or on a forest-wide basis. Also, the proposed action would pose a very small risk of damaging or extirpating undiscovered occurrences of other RFSS, BCC, and MIS with potential habitat in the analysis area. Therefore, for all RFSS, BCC, and MIS listed above, the proposed action may impact individuals but are not likely to lead to loss of viability or a trend toward federal listing.

RFSS, BCC, and MIS that are not listed in the tables above are not expected to occur in the analysis area. Therefore, for all RFSS, BCC, and MIS not listed, the action alternatives would have no impacts.

Consistency with the Forest Plan

The Proposed Action could affect undiscovered occurrences of on RFSS, BCC, and MIS. However, damage to known occurrences would be mitigated, minimized, and/or avoided, as needed, through design criteria, so the Proposed Action would be consistent with Forest Plan direction to mitigate, minimize, and/or avoid negative impacts on sensitive wildlife to the extent practical.

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Appendix A – Forest Plan Standards and Guidelines for GHFR Project

<table>
<tr><th>Type</th><th>Number</th><th>Direction Description</th></tr>
<tr><td colspan="3">Stream Channels, Lakes, and Wetlands</td></tr>
<tr><td>Goal</td><td>SW31</td><td>Maintain, enhance, or restore vegetation conditions that provide:
a) Ecological functions of riparian, wetland, and aquatic ecosystems.
b) Canopy conditions that regulate riparian and stream temperature regimes for native and desired non-native fauna and flora.
c) Natural recruitment potential for large woody debris and other sources of nutrient inputs to aquatic ecosystems.
d) Bank and channel stability and structural integrity.
e) Habitat and habitat connectivity for aquatic and riparian-dependent species and upland species that use riparian corridors.
f) Buffers to filter sediment.</td></tr>
<tr><td>Standard</td><td>SW34</td><td>No programmed timber harvest shall occur within the channel buffers identified in the table in SW37. Tree removal from the buffers may only take place if needed to meet aquatic or riparian resource management needs, or to;
a) Provide habitat improvements for aquatic or riparian species, or threatened, endangered, sensitive, and locally rare species;
b) Provide for public or worker safety;
c) Construct or renovate an approved facility;
d) Construct temporary road, skid road, or utility corridor crossings;
e) Conduct aquatic or riparian-related research, or
f) Allow for cable yarding.</td></tr>
<tr><td>Standard</td><td>SW37</td><td>During project-level planning and implementation, determine channel buffers for streams that would potentially be affected by proposed activities. The following table represents default buffer widths to be applied to both sides of the channel.
<table>
<tr><th>Stream Classification</th><th>Buffer width</th></tr>
<tr><td>Perennial</td><td>100 feet</td></tr>
<tr><td>Large Intermittent (>50-acre drainage area)</td><td>100 feet</td></tr>
<tr><td>Small Intermittent (<50-acre drainage area)</td><td>50 feet</td></tr>
<tr><td>Ephemeral</td><td>25 feet</td></tr>
</table>
Buffer widths may be adjusted based on interdisciplinary review and site-specific field investigation. The buffers shall, at a minimum, encompass the riparian area defined on the basis of soils, vegetation and hydrology and the ecological functions and values associated with the riparian area.</td></tr>
<tr><td>Standard</td><td>SW40</td><td>Skid trails and landings shall not be constructed within 100 feet of perennial, intermittent, and ephemeral channels except at crossings or when location outside the 100-foot zone pose a greater risk to aquatic or riparian resources. The 100-foot filter strip may be modified based on site-specific conditions such as soil type, slope, and stability.</td></tr>
<tr><td>Guideline</td><td>SW50</td><td>Maintained wildlife openings and associated access routes identified as degrading riparian or aquatic conditions should be mitigated or closed and restored. New wildlife openings within channel buffers may occur where needed to provide habitat for riparian species, or TEP, RFSS, or locally rare species, and where maintenance for these openings and their access routes can be achieved without degrading riparian or aquatic conditions.</td></tr>
</table>

Type	Number	Direction Description
Guideline	SW51	Ground disturbance should be avoided within seeps, vernal pools, bogs, fens, and other wetlands during project implementation. These areas should be managed to protect wet soils and rare plants and provide wildlife watering sources using the following protection: a) No new system roads or skid roads should be located within these areas except at essential crossings. Such crossings should be designed to minimize disturbance to the extent practical. b) Logs should not be skidded through these areas. Keep slash and logs out of them. c) Where available, a canopy of 60-100 percent crown closure should be maintained within and adjacent to these areas, unless a more open canopy is needed for TEP species or RFSS management. d) Mast trees or shrubs may be planted in seeps if mast plants are currently lacking.
Guideline	SW53	Use existing fire barriers, such as streams, roads, and trails for control lines where possible.
Guideline	SW54	Hand lines, wet lines, or black lines should be used where appropriate within channel buffers to minimize soil disturbance from fire suppression or control.
Management Direction for Fire Management		
Goal	FM05	Establish a framework for restoring and maintaining the role of fire in fire-adapted ecosystems. During watershed and project level planning, identify and prioritize opportunities to maintain, enhance, or restore fire-adapted ecosystems.
Goal	FM06	Use prescribed fire to establish, maintain, control, or restore forest vegetation (e.g., oak regeneration and fire-resilient stands), wildlife openings, savannahs, and grazing allotments.
Objective	FM09	Over the next 10 years use prescribed fire on 10,000 to 30,000 acres. Emphasize use in areas to reduce hazardous fuels and fire risk to property or investments, and/or in areas to maintain, restore, or enhance wildlife habitat or other ecosystem components.
Objective	FM10	Identify potential fire hazard areas in wildland/urban interface areas. Focus on fire-adapted ecosystems in Fire Regime 1, Condition Class 3 and Fire Regime III, Condition Class 2. Develop and prioritize vegetation treatment plans in coordination with local volunteer fire departments, governments, agencies, and landowners to reduce the risk from wildland fire.
Standard	FM12	A prescribed burning plan must be prepared and approved prior to using prescribed fire as a management tool. The plan shall address protection or maintenance of TEP species and habitat, cultural resources, watershed resources, air quality, private property, and other resources or investments as needed or appropriate.
Standard	FM15	All managed burns must comply with Smoke Management Programs for West Virginia when these are implemented.
Vegetation Diversity		
Goal	VE01	Provide vegetative diversity through a mix of natural and maintained openings, wetlands, and early, mid, and late successional forests to support a wide variety of habitats, forage, scenery, recreational settings, and socio-economic opportunities.
Objective	VE02	Maintain or create age class diversity on suitable timberlands to provide for sustainable timber production and a variety of structure and wildlife habitat. Treat an estimated 20,000 to 40,000 acres over the next decade to move toward desired age class conditions.
Objective	VE03	Treat an estimated 4,000 to 12,000 acres over the next decade on lands not suited for timber production to help restore ecosystems and enhance wildlife habitat.

Type	Number	Direction Description
Guideline	VE06	Native plant species should be used to revegetate, restore, or rehabilitate lands where natural regeneration is not likely to occur in a timely manner. Non-native, non-invasive plant species may be used: a) When needed in emergencies to protect resources (soil stability, water quality, etc) b) As an interim non-persistent measure to help re-establish native plants c) When native plant species are not available d) In permanently altered plant communities. When project objectives justify the use of non-native plant materials, documentation explaining why non-natives are preferred should be part of the project planning process.
Rare Plants and Regional Forester's Sensitive Plant Species		
Goal	VE07	Maintain or restore rare plant communities or individual populations to contribute to the biodiversity of the Forest.
Goal	VE08	Emphasize conservation and recovery of RFSS where quantity and quality of habitat is a concern. During watershed or project-level analysis in areas containing RFSS habitat, identify and prioritize opportunities for restoring or maintaining RFSS habitat.
Goal	VE09	Work with researchers, ecologists, geneticists, and other interested parties to develop seed zones or breeding zones for native plants.
Terrestrial Ecosystems		
Guideline	VE17	Collect, interpret, and display information on terrestrial ecosystems to: a) Determine the kinds and intensities of inventories needed, b) Identify and classify rare communities to aid in conservation of threatened, endangered, and sensitive plants and animals, c) Add to the Terrestrial Ecological Unit Inventory (TEUI) of the Forest, d) Predict locations of rare plants or their habitats from the TEUI, and e) Predict effects to terrestrial ecosystems from various management options at the project level.
Guideline	VE23	All seed used on National Forest System lands should free of seeds from noxious weeds.
Management Direction for TEP Species		
Goal	TE01	Provide habitat capable of contributing to the survival and recovery of species listed under the ESA. Provide habitat that may help preclude Proposed species from becoming listed.
Goal	TE02	Integrate TEP habitat management with other resource objectives.
Goal	TE03	Work with USFWS, WVDNR, and other appropriate personnel to identify and manage habitat for TEP species. Participate in recovery plan development for threatened or endangered species that occur on the Forest, or that may be influenced by Forest management activities.
Goal	TE04	Within watershed-level planning units, identify TEP species habitat and opportunities to maintain, restore, or enhance habitat conditions. Design and implement management actions at the project level to address opportunities and provide for ecological conditions, population viability, reproductive needs, and habitat components for TEP species.
Goal	TE05	Collaborate on outreach programs for TEP species and their conservation needs.

Type	Number	Direction Description
Virginia Big-Eared Bat		
Standard	TE14	Within 200 feet of hibernacula, maternity colonies, or bachelor colonies, vegetation management shall only be conducted for: a) Bat habitat maintenance or improvement, b) Public safety, or c) Research.
Standard	TE22	If any new Virginia big-eared bat hibernacula, maternity colonies, or bachelor colonies are discovered on the Forest, the Forest shall develop appropriate protection measures in cooperation with USFWS and WVDNR. These measures could include closure orders, signs, fences, or gates.
Indiana Bat		
Standard	TE23	Retain all shagbark hickory trees 5 inches in diameter at breast height (dbh) or greater in harvest units except where public or worker safety concerns or research opportunities exist.
Standard	TE24	After post-harvest treatments, retain an average of at least 6 snags per acre that are 9 inches dbh or greater within harvest units, except where public or worker safety concerns exist. Create additional snags, if needed, from the available leave trees to make up any difference. Prioritize snag retention and creation from the largest to the smallest dbh.
Standard	TE25	Retain all known roost trees until such time as they no longer serve as roost trees (e.g. lose their exfoliating bark or cavities, fall down, decay, or are no longer used by bats).
Standard	TE26	Where evidence of maternity colonies (reproductively active females or juveniles prior to August 15) is discovered, the Forest shall establish a 2.5-mile radius buffer around the evidence site and search for actual maternity colonies within this management zone. The radius may be adjusted if warranted by new scientific information. The search shall continue for 3 field seasons or until a maternity site is confirmed, whichever occurs sooner. While the search is ongoing, proposed actions in the management zone shall be reviewed in cooperation with USFWS and WVDNR to determine any site-specific protection measures that may be needed. If and when a maternity colony is found, the management zone shall be adjusted as specified in TE27. If no other evidence of maternity activity is found for 3 field seasons, the management zone shall expire.
Standard	TE27	If a maternity site is discovered, establish a management zone centered on the site. The management zone shall not exceed a 2.5-mile radius unless site-specific factors or new scientific information indicate that a larger zone is needed. The zone may be smaller than a 2.5-mile radius if an evaluation of topography, known roost tree locations, proximity of permanent water, or other site specific habitat characteristics indicates that a smaller zone is likely to satisfy the habitat needs of the colony. Needed protection measures within the zone shall be determined at a site-specific level in cooperation with USFWS and WVDNR.
Standard	TE28	If any new Indiana bat hibernacula are discovered on the Forest, the Forest shall develop appropriate protection measures in cooperation with USFWS and WVDNR. These measures could include closure orders, signs, fences, or gates.

Type	Number	Direction Description
Indiana Bat Primary Range		
Goal	TE29	Manage naturally occurring tree species composition to provide a continuous supply of suitable roost trees and foraging habitat for Indiana bat. Achieve vegetative diversity that maintains or improves Indiana bat habitat. Where consistent with management prescription emphasis, use a variety of silvicultural methods to create desired age class diversity.
Objective	TE30	Provide a continuous supply of suitable roost trees by maintaining a minimum of 50 percent of each primary range on NFS lands in any combination of mid successional (40-79 years), mid to late successional (80-120 years), and late-successional (>120 years) age classes.
Standard	TE31	Management of vegetation 5 inches dbh or greater may only be implemented if activities: a) Maintain or improve Indiana bat or other TEP or Sensitive species' habitat, or b) Address public or worker safety concerns, or c) Achieve research objectives.
Standard	TE32	Retain harvest unit snags greater than 5 inches dbh except where public or worker safety concerns exist.
Standard	TE33	Leave at least 5 cull trees per acre, if available—preferably shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras. Prioritize cull retention from the largest to the smallest dbh.
Standard	TE35	When designing and implementing regeneration harvest units, the following direction shall be used to help retain appropriate leave trees for Indiana bat habitat: a) Preferred residual trees for shelterwood and two-aged regeneration harvests should include the following species as available: shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras. Prioritize residual trees from the largest to the smallest dbh. b) Retain clumps of live trees and shrubs at a rate of 1/3 an acre per 5 to 8 acres of regeneration harvest area. Clumps should be co-located with other retained features.
Standard	TE36	Maintain a component of large over-mature trees, if available, in all uneven-aged harvest units to provide suitable roosting habitat.
Standard	TE37	Regeneration harvest shall not cause the early successional (0-19 years) age class of forest stands to exceed 10 percent of each primary range at any time.
Guideline	TE40	Shelterwood and two-aged regeneration harvests are the preferred silvicultural methods. Alternate methods may be used to meet other vegetation or wildlife habitat objectives when compatible with Indiana bat habitat management. Thinning from below is the preferred management method for stands originating before 1905. Other appropriate or preferred measures to maintain or improve Indiana bat habitat within primary range may be developed under consultation with USFWS and WVDNR.
Guideline	TE41	Without preventing the regeneration of desired tree species, sufficient basal area should be retained in even-aged harvest units to meet the habitat needs of Indiana bats. Basal area determinations should be coordinated between the project silviculturist and wildlife biologist, based on site-specific vegetative conditions and habitat needs.

Type	Number	Direction Description
Indiana Bat Hibernacula, Key Areas, and Maternity Sites		
Standard	TE42	Management of vegetation that is less than 5 inches dbh generally may occur within 200 feet of the hibernacula, within key areas, or within 2.5 miles of known maternity sites during any time of the year, provided adverse disturbance to bats is avoided.
Standard	TE43	Management of vegetation 5 inches dbh or greater may only be implemented within 200 feet of hibernacula or within key areas to: a) Maintain or improve Indiana bat, TEP, or Regional Forester Sensitive Species habitat, b) Address public or worker safety concerns, or c) Achieve research objectives.
West Virginia Northern Flying Squirrel (WVNFS)		
Standard	TE63	Suitable habitat shall be determined using maps collaboratively produced by the Forest, USFWS, and WVDNR. These maps shall be reviewed during watershed or project analysis and refined when Forest, USFWS, and WVDNR biologists determine that suitable habitat is or is not present. All verified capture sites shall be included in the suitable habitat maps.
Standard	TE64	Suitable habitat shall be considered occupied. Vegetation management activities in suitable habitat shall only be conducted after consultation with USFWS, and: a) Under an Endangered Species Act Section 10 research permit to determine the effects of an activity on WVNFS or to determine activities that would contribute to the recovery of the species, or b) To improve or maintain WVNFS or other TEP species habitat after research has demonstrated the beneficial effects of the proposed management, or c) When project-level assessment results in a no effect or may affect, not likely to adversely affect determination, or d) To address public safety concerns.
Management Direction for Wildlife and Fish		
Goal	WF01	Provide habitat diversity that supports viable populations of native and desired non-native wildlife and fish species, including Management Indicator Species (MIS), game species, and furbearers, and keeps RFSS from a trend toward federal listing. a) During watershed or project-level analysis, identify and prioritize opportunities to maintain or restore habitat for RFSS, Birds of Conservation Concern, and other species of interest. b) Within watershed-level planning units, maintain, enhance, or restore representative examples of habitats that would be expected under unmanaged conditions, to the extent allowed by land ownership patterns, existing conditions, and management prescription emphasis.
Goal	WF02	Manage human-caused disturbances to help protect wildlife and fish populations during critical life stages.
Goal	WF03	Provide habitat for those wildlife and fish species that contribute to social and recreational opportunities, such as hunting, fishing, trapping, and wildlife viewing.
Goal	WF05	Maintain, enhance, or restore habitat for migratory birds, with an emphasis on Birds of Conservation Concern for the Appalachian Mountains Bird Conservation Region, as identified by USFWS. During watershed or project-level analysis, identify current and proposed activities that are likely to affect populations of Birds of Conservation Concern.

Type	Number	Direction Description
Goal	WF06	In conjunction with ongoing inventory and monitoring efforts, and in coordination with monitoring conducted by WVDNR, Forest Service Research, Universities, and other interested organizations, monitor populations and habitats of RFSS, MIS, Birds of Conservation Concern, and other species of interest sufficient to inform watershed and project-level analyses of potential negative effects, as well as opportunities for maintenance, enhancement, or restoration of habitat.
Objective	WF08	Actively restore aquatic and riparian habitat conditions in 30-50 miles of stream over the next 10 years. Activities that restore or improve the natural structure and function of channel and riparian conditions may include the installation of instream structures, large woody debris loading, riparian fencing, riparian planting, and bank and channel stabilization.
Objective	WF09	Maintain at least 50,000 acres of mid-late and late successional (>80 years old) mixed mesophytic and cove forest to meet habitat needs for cerulean warbler, a Management Indicator Species.
Objective	WF10	Maintain at least 150,000 acres of 50-150-year-old oak and pine-oak forest in MPs 3.0 and 6.1 to meet habitat needs for wild turkey, a Management Indicator Species.
Objective	WF11	Maintain at least 20,000 acres of mid-late and late successional (>80 years old) spruce forest to provide optimum habitat for West Virginia northern flying squirrel, a Management Indicator Species. The long-term objective is to increase mid-late and late successional spruce forest to at least 40,000 acres.
Standard	WF13	For management actions that have been identified by the Forest Service as likely to cause a negative effect on RFSS or Birds of Conservation Concern populations, negative effects shall be avoided or minimized to the maximum extent practical while still accomplishing the purpose of the project or action. Unavoidable negative effects shall be mitigated to the extent practical and consistent with the project purpose.
Standard	WF15	When activities are proposed near a known active raptor nest, a wildlife biologist shall be consulted for measures to avoid or mitigate disturbance.
Guideline	WF16	When consistent with management prescription emphasis and direction, openings may be created and maintained in coordination with other resource projects to provide for vegetation diversity. Mechanical or chemical means, prescribed fire, or grazing may be used to help maintain openings. Native or desirable non-native, non-invasive trees and shrubs with high value for wildlife may be planted, released or pruned.
Guideline	WF18	Use Forest Service-approved portions of Conservation Strategies and Agreements, as appropriate, in the management of RFSS habitat to help keep management actions from contributing to a trend toward listing for these species.
Guideline	WF20	Activities with the potential for causing adverse effects should be avoided or mitigated to the extent possible within ½ mile of active peregrine falcon nests. Seasonal closure orders may be used to control human disturbance in the vicinity of peregrine falcon nests.
Guideline	WF22	Habitat improvement structures should be designed to complement riparian areas and management prescription emphasis. Improvement structures should be constructed of native materials where available.

Type	Number	Direction Description
Guideline	WF24	Habitat maintenance, enhancement, and restoration opportunities for migratory birds that are identified during watershed or project-level analysis should be implemented to the extent they are consistent with management prescription emphasis and project purposes, and to the extent practical and allowed by budget constraints.
Bald Eagle		
Standard	W25	Maintain 1,500-foot protection zones around nest sites that have been active within the last three nesting seasons. Activities within this zone must be compatible with bald eagle management. Compatibility determinations shall be made on a case-by-case basis.
Standard	W26	Seasonal closure orders may be used to control human disturbance in the vicinity of nests.
Standard	W27	A nest and the tree or structure where it is located shall not be removed or damaged as long as any usable portion of the next remains, regardless of the time elapsed since the nest was last used, unless there is a concern for public health or safety.
Timber Resource Management Planning		
Goal	TR01	Manage vegetation to provide a sustained yield of timber, contribute to local and regional economies, achieve desired age class distributions, and benefit other resources.
Goal	TR02	Use appropriate harvest technologies to ensure cost efficiency and demonstrate prudent forest management, while addressing environmental concerns and preserving ecosystem integrity.
Objective	TR03	Make available 25 to 105 million cubic feet of timber for the decade, which will contribute to Allowable Sale Quantity (ASQ).
Objective	TR04	Provide timber harvest, and related reforestation and timber stand improvement activities, to contribute toward the attainment of desired vegetation conditions. On suitable timber lands, harvest timber, other than by salvage, on an estimated 20,000 to 36,000 acres over the next 10 years.
Commercial Timber Sales		
Standard	TR08	Activity fuels (slash) shall be removed from permanent roads and recreation trails as part of normal harvest operations. Slash may be retained in wildlife openings if it is arranged into brush piles that would provide beneficial habitat structure without impeding wildlife movement and maintenance of openings. Slash may be retained in streams when considered beneficial for aquatic resources.
Guideline	TR09	Skid trails should normally be a minimum of 200 feet apart but may be closer to adjust to ground conditions. System roads should not be used for skidding.
Guideline	TR10	System roads should not be used as log landings unless they are determined to be environmentally preferable and do not result in irreversible road damage. Within one growing season after completion of harvest activities, wildlife openings that are used as log landings should be rehabilitated using vegetation beneficial to wildlife.
Guideline	TR11	Log landings, equipment storage areas, portable sawmill sites, and other concentrated activities should be located outside of channel buffers.
Guideline	TR12	In and around developed recreation sites, activity fuel should be removed by chipping, burning, or other means, including opportunities for fuelwood gathering.
Guideline	TR13	Minimize bole damage by reducing the number of skid trails and using “bumper trees”.

Type	Number	Direction Description
Transportation Planning and Development		
Goal	RF01	Provide a transportation system that is safe, cost efficient, meets access needs, and minimizes adverse impacts to natural resources.
Goal	RF02	Provide developed roads to the density and maintenance level needed to meet resource and use objectives. During watershed or project-level planning: a) Update inventory of area transportation system. b) Determine the minimum transportation system necessary to achieve access management objectives. c) Incorporate cost efficiency into construction, reconstruction and maintenance needs. d) Identify roads to decommission, obliterate, replace, or improve that are causing resource damage. e) Integrate needs for off-road parking.
Standard	RF06	New road construction shall avoid wetlands where feasible. If a wetland cannot be avoided, road construction may be allowed as long as the subsurface drainage patterns can be preserved and maintained. Any road that would cross a wetland shall cross in a way that minimizes disturbance to the wetland.
Guideline	RF10	During watershed or project-level analysis, opportunities for road decommissioning should be identified and prioritized based on: a) Hazard assessments in the Roads Analysis Report for the Monongahela National Forest (January 2003) or updated versions b) Identified needs in drainages with 303(d) impaired water bodies c) The access needs of cooperators, permittees, and private landowners d) Prescription units that exceed road density standards for the management prescription e) Other site-specific concerns identified in the watershed or project analyses.
Guideline	RF11	The process to determine road maintenance levels should evaluate the purpose of the road, the type of vehicles expected, the duration and frequency of use, and necessary environmental protection measures.
Guideline	RF12	Roads that are no longer needed for access or management should be decommissioned. Evaluate long-term access needs and potential trail conversion or linear wildlife opening opportunities prior to making a decision to decommission a road.
Guideline	RF13	Road decommissioning should include the following: a) Road should be physically blocked to prevent vehicle use, unless designated for use by trail vehicles. b) Drainage structures should be removed and natural drainage re-established, unless needed for use by trail vehicles. c) The road profile should not normally be returned to contour during decommissioning, but recontouring may occur to meet special environmental or visual needs. d) Exposed soils should be revegetated and natural plant succession should be allowed to occur, unless needed for trail purposes. e) Decommissioning should normally be accomplished in conjunction with other project work but may occur independently if funding is available.
Guideline	RF14	Temporary roads may be constructed and used to provide for short-term management access needs.
Standard	RF15	Temporary roads shall be rehabilitated and returned to productivity following their use.

<table>
<tr><th colspan="3">Management Direction for 3.0 – Vegetation Diversity Emphasis</th></tr>
<tr><th>Type</th><th>Number</th><th>Direction Description</th></tr>
<tr><td colspan="3">1900 - Vegetation</td></tr>
<tr><td>Goal</td><td>3001</td><td>Enhance diversity of forest vegetative cover through the dispersion of a variety of species, types, and ages.</td></tr>
<tr><td>Objective</td><td>3002</td><td>Over the next 10 years regenerate the following amounts of forest vegetation to begin moving toward desired age class conditions for these forest types:
Northern hardwoods: 1,000-2,000 acres Mixed cove hardwoods: 8,000-12,000 acres Mixed oak: 3,000-4,000 acres</td></tr>
<tr><td colspan="3">2350 - General Forest Environment Areas</td></tr>
<tr><td>Standard</td><td>3005</td><td>Selected areas, trails, or roads may be closed, where appropriate, to motorized vehicles during specific periods to protect resources, provide for public safety, or reduce user conflict. The intent, however, is to provide for public motorized use.</td></tr>
<tr><td colspan="3">2410 - Timber Resource Management Planning</td></tr>
<tr><td>Standard</td><td>3006</td><td>There is no limit on the timing or proportion of the prescription area to be entered for timber practices during an entry cycle.</td></tr>
<tr><td>Guideline</td><td>3007</td><td>Management with uneven-aged silviculture systems should be based on visual quality, timber products, economics, and site and species capabilities.</td></tr>
<tr><td>Guideline</td><td>3008</td><td>The following maximum diameter at breast height (dbh) sizes should be used as guidelines as to when mature trees should be harvested under the uneven-aged silvicultural system.
<table>
<tr><th>Forest Type</th><th>Low Quality Site</th><th>High Quality Site</th></tr>
<tr><td>Hardwoods</td><td>22”</td><td>28”</td></tr>
<tr><td>Conifers</td><td>16”</td><td>22”</td></tr>
<tr><td>Oak - Pine</td><td>20”</td><td>24”</td></tr>
</table></td></tr>
<tr><td colspan="3">2470 - Silvicultural Systems</td></tr>
<tr><td>Guideline</td><td>3009</td><td>Use even-aged management when shade-intolerant vegetation is the species objective or when needed for accomplishing diversity objectives.
a) Clearcutting with reserve trees is the normal regeneration cutting method to achieve these objectives. Significant exceptions include:
1) Shelterwood may be used when needed for regeneration of a particular species, or visual resource management objectives.
2) Deferred rotation (two-age) cutting may be used to retain large trees well into the next rotation.
b) Thinning is a normal practice, particularly on better quality sites.</td></tr>
<tr><td>Guideline</td><td>3010</td><td>Uneven-aged management should be used when shade-tolerant vegetation is the objective, or when needed to meet scenic integrity objectives. Group selection cuts should be limited to two acres or less.</td></tr>
<tr><td colspan="3">2470 - Timber Stand Improvement and Reforestation</td></tr>
<tr><td>Guideline</td><td>3011</td><td>Healthy trees should be retained in and around developed recreation areas. Timber stand improvement should favor long-lived trees with healthy crowns, flowering trees, vegetation for screening or other objectives of a site-specific vegetation management plan.</td></tr>
</table>

2630 – Wildlife Habitat		
Goal	3012	Maintain natural areas of standing water as wildlife watering sources. Create artificial water sources as needed in conjunction with other resource activities.
Objective	3013	Create up to 1,000 acres of wildlife openings over the next 10 years.
Guideline	3014	Conifer species may be planted or controlled where needed to enhance vegetative diversity for wildlife.
7100 - Transportation System Planning		
Goal	3015	Provide a road system adequate to manage the area for intensive timber operations.
Guideline	3016	Construction of new classified roads should not cause road density within the prescription area unit to exceed 1.0 mile per square mile for collector roads, or 4.0 miles per square mile for any combination of collector and local roads.

GAULEY HEALTHY FOREST RESTORATION CE

FIRE AND FUELS EFECTS

/S/ John Fry 02/24/2020

Assistant Fire Management Officer

For most of the 20th century, any form of wildland fire, was quickly suppressed for fear of uncontrollable and destructive wildfires. In the 1960's, policies governing wildfire suppression changed due to ecological studies that recognized fire as a natural process. Today, polices advocating complete fire suppression have been replaced by policy that allows fire to act as a tool to meet resource objectives. Fire played an important role in the development and maintenance of oak forest in the eastern United States (Van Lear, Brose, and Keyser 2000). Declines of oak forests have been noted throughout much of the East and are often attributed to reduced frequency. Prescribed fire can be an important tool for regenerating oak stands by reducing competition and oak sprout vigorously after fire.

The identified proposed prescribed and fuels treatments are in conjunction with the Monongahela National Forest Plan. The Forest-wide desired condition is to use fire as a tool to achieve and maintain desired vegetative conditions and fuel levels. The Forest-wide goals and objectives of implementing fuels reduction and fuels break projects are to be located in areas that would reduce the wildfire risk to communities, municipal water supplies, and at risk federal land and prescribed fire would be used to mimic natural process to accomplish resource objectives.

Proposed Action

The proposed fire and fuels treatments include the creation and maintenance of fuel breaks adjacent to private property, municipal water sheds and valued recreation sites. Biomass would be removed or treated, thus allowing fuel loading and fire hazards to decrease. Prescribed fire would be reintroduced into fire-adapted ecosystems thus fulfilling the Forest Plan objectives and goals.

The purposed treatments would move the project area towards a more resilient landscape and reducing overall surface fuel loading in the stands being treated. Crown-to-crown contact would be eliminate where thinning activities occur. Without crown-to-crown contact the potential for crown fire development and the subsequent destruction of the trees on site would be greatly reduced. Overall, the probability of intense surface fires in mixed hardwood stands would be reduced.

Prescribed Burning:

The cumulative effects of periodic prescribed burning would be the reduction of hazardous fuels conditions and the reintroduction of fire into fire-adapted ecosystems thus fulfilling the Forest Plan.

The direct effects of implementing using prescribed fire would be a decrease in fuel loading. The proposed action would have a positive effect on restoring the natural fire regime by maintaining disturbances in ecosystems that have adapted over time to periodic short-return interval disturbances. Studies show that areas that have prescribed fire introduced prior to a wildfire exhibit lower rates of spread, less intensity, less severity, and a smaller final wildfire size. When combined with past, present and future activities this project would provide short term and long term positive contributions within the analysis boundary by reducing fuels and reintroducing fire into the ecosystem.

The effects would be a gradual decrease in fuel loadings. After a couple of burns, the effectiveness of prescribed burning would start to decline, at which time maintenance burns would be implemented every 5-10 years. Periodic prescribed burning would reduce hazardous fuel conditions and the reintroduction of fire into the fire adapted ecosystems thus fulfilling Forest Plan objectives and goals. There would also be a reduction in the probability of damage to private and public improvements should a wildfire occur, a reduction of fuel loading to provide for public and firefighter safety, and protection of public and private property adjacent to the burn units in the event of a wildfire. There would be a very low risk of any effects to private property during or following prescribed burn implementation.

Prescribed fire would generate primarily short term smoke emissions. Smoke would disperse quickly and have no effect on air quality parameters. The majority of emissions from smoke produced by prescribed fires should typically occur within the first 8 to 24 hours of the prescribed burn being initiated. Residual smoldering, with small amounts of smoke production would continue for several days afterward in 100 and 1000 hour fuels sizes, but should disperse quickly. It is expected that smoke from the prescribed burns could impact roads and commercial and residential areas downwind, causing reduced visibility and very short term local air quality reduction. Signage maybe be used to warn motorists to slow down along sections of roadways if visibility is greatly reduced. Based on limited to no direct or indirect effects to the air resource, there is limited potential for a cumulative effect to the air resource from the Proposed Action.

This activity would have no long-term negative effects on visitor safety and should increase public safety due to the decreased chance of wildfire from the controlled reduction of fuels. The proposed action would have a positive effect on restoring the natural fire regime by maintaining disturbances in ecosystems that have adapted over time to periodic short-return interval disturbances. Studies show that areas that have prescribed fire introduced prior to a wildfire exhibit lower rates of spread, less intensity, less severity, and a smaller final wildfire size. When combined with past, present and future activities this project would provide short term and long term positive contributions with the analysis boundary by reducing fuels and reintroducing fire into the ecosystem.

Mechanical Treatment:

Fuel breaks would be created by removing both understory and over story trees. Trees would be removed to allow for open canopy (no tree to tree contact). Hardwood species would be selected

to remain because of their fire resistant properties. Tree density will vary with more open conditions closest to private property to encourage grasses and fade into a heavier density as distance from private property increase. The desired condition is a more natural appearance of forest transitioning to open conditions near private property. Any residual fuels left after treatment implementation will wither be burned (piles or broadcast burn) or mechanically treated (chipped). Subsequent maintenance at three to seven year intervals by mechanical treatments or by prescribed burning to remove encroaching vegetation and ladder fuels would be done to maintain their effectiveness.

The direct effects of would be a decrease in fuel loading. The effectiveness of the activities would decease as biomass increased. The indirect effects would result in fuel loadings slowly increasing within the project area without maintenance treatments. The treatments would decline in effectiveness over time, with mechanical treatment declining over a ten-year period. The three-to-ten year maintenance schedule of the fuel breaks provide a constant benefit to the analysis area by maintaining lighter fuel loadings and thus low fire intensity. The cumulative effects of the planned periodic maintenance treatments would assure that fuel loading would not increase to pre-treatment levels.

The desired condition from a Fire and Fuels perspective is the protection of life and property, the reduction of hazardous fuels accumulations and the restoration of a fire adapted and resilient ecosystem. The project's proposed vegetation management activities and use of prescribed fire are needed to help restore the project area's natural fire regime, reduce the intensity of a wildfire and subsequent damage to the public and/or private property.

References

Van Lear D.H, Bros, Patrick and Keyser P.D. 2000 "Using Prescribed Fire to Regenerate oaks" Workshop Fire, People and the Central Hardwood Landscape, p. 97 – 102.

Include in portion of document explaining spatial and temporal area of proposed actions

Nearly all associated actions with the Gauley Healthy Forest Restoration (GHFR) project will only occur on portions of the North Fork of Cherry River, including the Little Lick Run catchment and all areas downstream to the confluence with the South Fork of Cherry to form the Cherry River. Approximately 5 acres of proposed actions would occur in the Cranberry watershed. The effects of the action within the Cranberry watershed are expected to be insignificant to populations of candy darter within this watershed. Thus, the aquatic spatial analysis area of this project is focused on those areas of the North Fork of Cherry and tributaries, as described above. The temporal boundary used to evaluate most direct, indirect effects to aquatics is approximately 10 years. This period was used because it best reflects the expected timeframe for most anticipated direct and indirect effects to occur in association with this project and allows analysis results to contain much greater certainty and less speculation than using a different time period.

Candy Darter (*Etheostoma osburni*) and Proposed Critical Habitat

Critical Habitat Description

The proposed critical habitat for the candy darter is approximately 370 linear stream miles (596 kilometers), subdivided into 5 units, 3 of which occur in West Virginia, while 2 occur in Virginia. Current proposed critical habitat units for the candy darter only includes areas where candy darter is known to persist and contain one or more the physical and biological factors (PBF) to support life-history processes critical to the conservation of the species. The area applicable to this project is Unit 5 – Upper Gauley unit, specifically Unit 5f – Cherry River, as all project actions are comprised fully within the lower half of the North Fork Cherry River (NFCR) watershed (HUC: 050500050401), approximately 7.5 miles of proposed critical habitat is located within the project area.

Primary Constituent Elements

The primary constituent elements are those specific elements of the PBF that provide for a species' life history processes and are essential to the conservation of the species. The following are the primary constituent elements identified for the candy darter as listed and how these elements are currently represented in the GHFR project area:

(1) Ratios or densities of nonnative species that allow for maintaining populations of candy darters

- Specific ratios and/or densities of nonnative species are not known within the North Fork Cherry River, although historically the West Virginia Division of Natural Resources (WVDNR) has conducted trout stocking with rainbow, golden, brown, and hatchery brook trout during the spring and fall seasons. The WVDNR are proposing a change to current stocking practices, no longer stocking brown trout within candy darter range, which are known to prey upon darter species.

(2) A blend of unembedded gravel and cobble that allows for normal breeding, feeding, and sheltering behavior

- The North Fork Cherry River does support the substrate necessary for normal habitat and feeding and sheltering behavior of candy darter. However, once tributaries begin having higher gradient, these desirable conditions begin to drop out and stream conditions are not suited for the candy darter. Embeddedness and fine sediment rates are slightly impaired for a forested system of this size compared to other sites across

the Forest. Table 1 below shows fine sediment occurrence at sites monitored in the project area exceed levels above what is considered to have an effect on aquatic biota (Edwards et al. 2007).

(3) Adequate water quality characterized by seasonally moderated temperatures and physical and chemical parameters (e.g., pH, dissolved oxygen levels, turbidity) that support normal behavior, growth, and viability of all life stages of the candy darter.

- The water quality of the North Fork Cherry and surrounding tributaries is generally lower pH and more acidic because the underlying geology is not able to buffer for the heavy atmospheric acidic deposition that occurs in this watershed. This is currently being mitigated by WVDNR efforts of ongoing limestone sands added higher in the watershed to neutralize acidity of the Cherry River and bring pH closer to a circumneutral value (between 6.5 to 7.5). Several tributaries still supply pulses of lower pH influx, though generally gets diluted enough to not heavily influence downstream pH. This watershed is considered to be a high quality fishery of the state, with important mixing qualities, such as stream gradient, that lend well to having high levels of dissolved oxygen (DO). The North Fork Cherry River is listed as "impaired" for Aluminum (Al) concentrations on the West Virginia 303(d) list of impaired streams. Aqueous concentrations of Al have more relevance to brook trout (Decker and Menendez1974), effects to candy darter or similar Percidae are currently not well studied. Hunters Run and Desert Branch are also listed as impaired for pH.

(4) An abundant, diverse benthic macroinvertebrate community (e.g., mayfly nymphs, midge larvae, caddisfly larvae) that allows for normal feeding behavior.

- The average West Virginia Stream Condition Index (WVSCI) score for two sites on the main stem Cherry River indicate an index score of 84 out of 100, indicating good macroinvertebrate composition and abundance. The average EPT score of mayfly, stonefly, and caddisfly was 88.5 out of 100 indicating diverse community of macroinvertebrates that signify good water quality (U.S. Environmental Protection Agency 2000).

(5) Sufficient water quantity and velocities that support normal behavior, growth, and viability of all life stages of the candy darter.

- The North Fork Cherry River and associated tributaries are all associated with natural variation in stream flows. These flows are generally highest during spring snowmelt run-off, and lowest in late summer. All determined growth and viability of the species would not be expected to vary from the projected actions. Regeneration timber harvest could marginally increase the base flow during the growing season, however, high flow changes will be negligible from harvest actions.

Ecology – The candy darter is an endemic fish species to 2nd order streams and larger rivers within the Gauley and greater New River watersheds in West Virginia and Virginia. They prefer swift flowing riffle and run habitats with rocky substrate in small to moderate size streams that are characterized as cool to cold water systems. The candy darter has been described as a habitat specialist (Chipps et al. 1994) because they occupy stream bottom niches typically characterized by gravel-cobble substrates that are free of excessive sedimentation and embeddedness which allow candy darter to utilize interstitial spaces for shelter/cover, feed on benthic aquatic insects, and successfully reproduce (U.S. Forest Service 2018). Research suggest candy darter spawning occurs around mid-April, while eggs incubate until June (Schoolcraft et al. 2002). Recent research suggests that ontogenetic shifts and seasonal habitat plasticity may introduce complexity when

identifying suitable habitat for some populations (Dunn and Angermeier 2016). Young-of-the-year and juveniles tend to utilize stream margin habitats and smaller substrate more than adults. Candy darter reach sexual maturity at age 2 and have a life expectancy of 3 years. Migration tendencies and capabilities are not well understood at this time.

Distribution - The historical distribution of candy darter was more expansive than the current distribution (Jenkins and Burkhead 1994). Extant populations of candy darter represent only 17 of 35 historically known populations distributed among five of seven historically known meta-populations - Bluestone, Lower New River, Upper Gauley, Lower Gauley, and Middle New watersheds in the Appalachian Plateaus physiographic province and the Upper New River and Greenbrier watersheds in the Valley and Ridge physiographic province (Federal Register/Vol. 83, No. 225 2018). Chipps et al. 1994 reported on the status of candy darter on the Monongahela National Forest and found them to be well-distributed in the Cherry, Upper Greenbrier and Upper Gauley river systems. However, he expressed concerns for populations in the Williams River, Deer Creek and Anthony Creek and identified siltation as the major threat to candy darter populations.

Table 1: Water Chemistry and Stream Condition Summary of Monitoring within the GHFR project area

Stream	*Sample Date*	*pH*	*Conductivity – uS/cm*	*ANC – ueq/L*	*% Fines < 4mm*	*% Fines < 1mm*
Coats Run	3/25/2019	6.86	18.6	71.23	-	-
Coats Run	9/24/2019	7.12	29.7	221.84	-	-
Hunters Run	4/2/2018	6.39	16.3	42.41	33.28 (AEUI 2019)	14.33 (AEUI 2019)
Hunters Run	9/24/2018	7.08	31.3	193.3	-	-
Desert Branch	3/28/2017	5.45	16.1	21.56	15.82 (AEUI 2016)	9.86 (AEUI 2016)
Desert Branch	9/12/2017	5.64	16.5	23.16	-	-
North Fork Cherry River, lower	4/2/2018	6.60	29.1	67.82	-	-
North Fork Cherry River, lower	9/24/2018	6.75	22.6	93.28	-	-

The Forest conducts annual Aquatic Ecological Unit Inventory (AEUI) monitoring of streams across the forest, typically aiming to survey a stream reach every 5 years. Monitoring includes collecting stream morphology parameters including; pebble count, channel cross-section, fine sediment samples, valley and stream gradient, and stream sinuosity. Habitat data is also collected including; habitat unit classification (pool, glide, riffle and run) and the residual pool depth of pools, also any large wood that can be found in a unit. The Forest also conducts surveys of fish populations within a 100 meter reach. The fish sampling is conducted with a backpack electroshocker, and typically a three person crew. A triple-pass depletion sample of the reach is performed. Fish sampling does not specifically target candy darter or their habitat, meaning, monitoring data would not be considered an intensive survey for candy darter, although, the information above contains any information that has been collected in the project area. Surveys in the project area have only occurred in the larger tributaries of the NFCR, no survey sites occur within the portion of the main stem NFCR within the project.

Locality records indicate candy darter presence in the NFCR as recently as 2014 (Gibson et al. 2018). This information suggests candy darter is distributed throughout the entire NFCR where suitable habitat exists. The Upper Gauley meta-population that contains the GHFR project area was evaluated as having moderate resiliency as part of the recent species status assessment for candy darter (U.S. Forest Service 2018). The condition of candy darter metapopulations was determined by using eight metrics of physical habitat, non-native competition, and population demographics Status and Threats - The U.S. Fish and Wildlife Service (hereafter referred to as "Service") announced a final ruling to list candy darter as a federally endangered species with an effective date of December 21, 2018. Hybridization with the introduced but closely related variegate darter (*E. variatum*) was identified as a primary threat to the viability of candy darter populations. Other contributing threats to candy darter populations that are noted include water temperature, excessive sedimentation, habitat fragmentation, water chemistry, water flow, and competition with non-native species.

Like candy darter, variegate darter is native to the Kanawha River basin but its distribution was historically confined to areas downstream of Kanawha Falls. Kanawha Falls functions as a natural migration barrier preventing the upstream dispersal of variegate darter into the upper Kanawha River basin where the candy darter is an endemic species. However, variegate darter now exist upstream of the falls, presumably transported and released by way of one or more "bait bucket transfers". Variegate darter alleles were first reported in the Upper Gauley watershed in 2014. Variegate darter has progressively invaded candy darter habitats allowing these two species to inter-breed and produce fertile hybrid offspring. Hybridization of these species is poised to genetically swamp out candy darter throughout nearly all of its remaining distribution in West Virginia.

Recent evaluation of candy darter range and speciation has helped to identify streams where extant candy darter populations still occur, where variegate darter are hybridizing with candy darter, and where there is relative robustness of remaining intact populations of candy darter (Switzer et al. 2008 and Gibson 2017). The meta-population in the Upper Gauley watershed (which includes the GHFR project area) is suspected to be genetically pure, although genetic

analysis of a few sampled individuals revealed the presence of variegate darter alleles (Gibson 2017). Summersville Lake dam functions as an effective physical barrier to upstream migration of fish that occur in the lower Gauley River, including variegate darter. It is possible that variegate darter could occupy areas upstream of the dam at some time in the future by means other than natural migrations. However, proactive management (e.g. signage, public awareness, fishing regulations, etc.) of various state and federal agencies are attempting to reduce the potential for variegate darter introductions into the upper Gauley River system.

Prior to federally listing as an endangered species under the Endangered Species Act (ESA), candy darter was identified as a Regional Forester's Sensitive Species (RFSS) for the Monongahela National Forest. The Forest Plan for the Monongahela National Forest provides direction (Guideline WF18) to use conservation strategies in managing RFSS habitat to help prevent management actions on the Forest from contributing to a trend toward federal listing. No formal conservation strategy has been developed for candy darter although various Forest Plan standards and guidelines that address general aquatic resources management issues and priorities serve as favorable direction for the conservation of candy darter habitat on the Forest.

Potential Direct and Indirect Impacts to Critical Habitat in the Project Area:

Timber harvesting is expected to produce approximately 28.6 additional miles of new temporary road used to mechanically remove trees and transport to landings, 30.4 miles of reconstructed road on existing features, and one mile added as a temporary haul road.

West Virginia standard Best Management Practices (BMPs), National Core BMP Technical Guide FS-990a (U.S. Forest Service 2012), Forest Plan guidance (U.S. Forest Service 2006), and other project design features will help reduce short-term negative effects of project activities relating to conventional vegetation management's 59 miles of associated temporary road (skid) system throughout harvest units. Direct and indirect effects to aquatic resources from temporary road creation for vegetation management actions (thinning and regeneration harvests) include a low to moderate risk for limited adverse impacts associated with stream sedimentation and altered watershed hydrology; this risk would only occur during active project implementation and perhaps for a brief period there-after.

Timber harvesting, roads, skid roads, and log landings are ground disturbing activities that may alter surface and subsurface hydrology and potentially result in accelerated runoff, new channel cutting, channel head-cutting, and increased soil erosion and sediment delivery to streams if not properly addressed. Changes such as these can affect soil and water quality and degrade physical characteristics of aquatic habitats including those associated with occupied and proposed critical habitat for candy darter within the GHFR project area. The extent of effects is largely influenced by the amount and type of the ground disturbance, soil characteristics, topography and landform, proximity to stream channels, pre-existing conditions of the receiving channels, and effectiveness of design features and mitigation measures associated with project activities.

Streams associated with the GHFR project area are already impaired by high levels of fine sediment predominantly as a result of past land use practices (Table 1). Adverse effects to

aquatic biota are documented in MNF streams when the percentage of fine sediment <1mm is greater than approximately 5 percent (Edwards et al. 2007). These impaired conditions are present at all monitoring locations in the project area. Additional accumulations of stream sedimentation could further compromise habitat qualities and therefore, affect aquatic biota associated with this aquatic ecosystem.

The Monongahela Land and Resource Management Plan (LRMP) has established standards and guidelines to reduce the potential for effects to water quality and aquatic biota during Forest actions. For example, Forest Plan standard SW37 defines buffer widths for perennial, intermittent and ephemeral stream channels that are incorporated by referenced in other Forest Plan standards to help protect stream resources from potential project impacts (including soil disturbance and erosion). Forest Plan standard SW34 prohibits programmed timber harvest or any tree removal from stream channel buffers (with few exceptions). Forest Plan standard SW40 requires skid trails/roads and landings to maintain a filter strip of at least 100 feet from all stream channels. In addition, project actions will effectively decommission new skid roads using Forest Plan standard RF13, and address maintenance needs on existing Forest System roads within the project area.

Conventional Timber Harvesting:

Timber harvesting for this project includes clear-cut prescriptions that essentially cut all trees to regenerate target stands and thinning prescriptions that remove approximately 1/3 of the standing basal area of timber in target stands. Roads, landings, and skid roads are necessary to implement these prescriptions using conventional harvesting methods. Each of these activities require ground disturbance that can impact hydrology, riparian and aquatic resources to various degrees depending on a number of variables. Roads and landings will be evaluated after their near term use to identify locations that require further action, consistent with the Forests' ongoing restoration, to get the area to a watershed stable condition. Disturbance of the forest floor and ground cover in the general treatment unit area (i.e. excluding haul roads, skid roads, or landings) is generally dispersed and not concentrated, and consequently has a much lower probability for impacts to hydrologic and aquatic resources. This is because soil disturbance typically only occurs at landing sites and where skid roads are created. Also, compaction is typically not an issue because the harvesting is not concentrated and heavy machinery is not repeatedly tramming the same area (the exception being skid roads and landings).

Water Yield - Annual water yield conveyed by streams is influenced by numerous environmental factors including rates of evapotranspiration associated with contributing watershed areas. Removing trees can reduce rates of evapotranspiration and consequently increase water yield transported by streams. Watershed studies in eastern deciduous forests in Appalachian regions found measurable increases in water yield when approximately 20 to25 percent of the basal area of standing timber is removed from contributing watershed areas (Hornbeck et. al. 1993; Stuart, Edwards, 2006). Increases were most apparent in the first few years after harvesting and were virtually nonexistent after approximately 5 to 10 years post-harvest in these studies. Increases were found to be measurable only during base flow or low flow conditions, potentially having a slight benefit.

Negative effects to aquatic resources from water yield variations are unlikely to occur.

Additionally, the relatively small catchments that could experience increased water yields as a result of timber harvesting are located higher in the watershed, upstream from or otherwise outside of suitable candy darter habitat. Potential effects associated with increases in water yield from these small headwater streams are expected to dissipate as the smaller streams flow into increasingly larger receiving channels downstream where suitable candy darter habitat exists.

Water Chemistry - Most streams in the GHFR project area are currently impacted by relatively high rates of atmospheric acid deposition. This area of the forest faces high soil and water acidity because of the acid rain produced by coal burning power plants to the West; Cherry River watershed has some of the highest rates of acid deposition in the country (Farr et al. 2009. Stream acidification within this project area is a function of the watersheds being predominantly composed of soils and underlying geology that are highly vulnerable to the effects of the high rates of atmospheric acid deposition. Streams with an acid neutralizing capacity (ANC) of values nearing 0 (zero) are not able to buffer acid deposition and stream acidity as well as streams with an ANC value of 100 or more. Table 1 shows that most streams in the project action area have high values because of limestone treatments higher in the headwater. Applications of limestone sand are routinely applied by WVDNR to various streams in the project area to help mitigate some effects associated with acid deposition. Desert Branch displays lower ANC values and currenly has no limestone treatment in this catchment.

Forest System Roads Maintenance – For this project there will be no new Forest system roads constructed. System road maintenance of 19.1 miles is proposed for this project area. Existing system roads have been identified to receive upgraded maintenance as needed and would consider elements such as; the purpose of the road, types of vehicles expected, duration and frequency of use, and environmental conditions currently causing resource concern. The type of maintenance that could occur includes mowing, grading, cleaning or replacing cross drain culverts, and applying gravel to the surface. Table 2 identifies the distribution of these roads in individual watersheds or catchments in the NFCR watershed. One crossing will be a temporary bridge placed on Hacking Run and the other will be a culvert replacement on Spencer Run. Both crossing locations will be greater than one half mile from suitable candy darter habitat in North Fork Cherry River. The Hacking Run crossing will be going in at a location where a temporary bridge has already been installed and removed previously. The Spencer Run crossing will be a replacement with a larger structure that would involve slightly more ground disturbance, however the footprint of the work would still be less than one-half acre. Sediment and Erosion control measures will be implemented at stream crossings to reduce the potential for effects. Following conservation measures outlined below and National Core BMP guidance (Road-7) (USDA Forest Service, 2012), these actions are not expected to affect suitable candy darter habitat. Road stream crossing structures that warrant replacement will be designed in accordance with stream simulation design methodology to restore free movement of aquatic biota and provide continuity for other stream processes and functions including the conveyance of bedload material, LWM, and flood flows through the stream crossing structure.

Table 2. Drainage Catchments with Proposed Road Maintenance

Stream Catchment	Catchment Size (square miles)	Road Construction (miles)	Road Maintenance (miles)	Stream Crossings

Spencer Run	0.85	0	0.58	1
Desert Branch	1.51	0	3.8	1
Hacking Run	0.84	0	0.4	1
Hunters Run	3.38	0	4.3	1
Coats Run	1.55	0	4.1	2
Little Lick Run	1.34	0	1.2	0

Roads potentially have negative effects on aquatic ecosystems as previously described (alter natural hydrologic conditions, increasing erosion and stream sedimentation, fragmenting aquatic habitat, etc.). However, maintenance of Forest System roads associated with this project are unlikely to adversely affect the existing condition of the aquatic ecosystem in the project area. This conclusion is dependent upon the compilation of road management actions that help form the strategy for maintaining or enhancing watershed conditions in this project area. Road management actions that are key to facilitating the expected results for aquatic resources include: compliance with Forest Plan standards (SW35, RF04, and RF07) and National core BMPs to control the potential for adverse effects during road construction, reconstruction and maintenance activities.

Landings - Log landings are necessary for timber harvesting activities. The project plans to use a total of 40 landings. 33 landings will be used for conventional logging, of which 13 will be newly created. There will also be 7 helicopter landings, of these, 4 will be newly created. Conventional landings typically account for 0.5 acres and helicopter landings are slightly larger at around 2 acres. Short-term effects related to the construction and use of landings will expose soil and may produce sediment. Proper application of West Virginia BMPs, National Core BMP direction (Veg. 6) and design features will be used to help limit potential effects associated with stream sedimentation coming from these sites. For example, the Forest Plan direction (Standard SW 40) requires that all landings be located at least 100 feet from any stream channel (perennial, intermittent and ephemeral) and to stabilize them upon completion of their intended use following the project. Treatments necessary to stabilize landings include vegetative ground cover and possibly other measures including regrading, soil de-compaction, and soil amendments (such as fertilizer and lime). The creation and use of these landings will follow direction as identified in the National Core BMP Technical Guide. Landings that satisfy these conditions are expected to have inconsequential effects to the aquatic ecosystem.

Temporary roads - temporary roads are a necessary component for conventional ground-based timber harvesting within the project area.

The GHFR project is expected to use 59 miles of temporary road for the removal of trees from harvest units. Of these, 28.6 miles will be newly constructed temporary roads. The remaining 27.1 miles are currently existing features on the landscape that will be reused for this projects activities. Decommissioning will occur within three years of final project actions. The method of decommissioning temporary roads and skid roads will consist of treatment with BMPs such as removing temporary crossings and culverts, establishing protective ground cover, and installing

water-bars of appropriate spacing and design to reduce potential adverse watershed impacts. Decommissioning actions are outlined in Forest Plan guideline RF13, parts a-e. The greatest potential for erosion and sedimentation occurs the first year post-harvest and generally decreases each year after that. Edwards and Williard (2010) found that the application of appropriate BMPs have been shown to be 53 to 94 percent effective at reducing sediment in the first year after harvesting. \

Non-Native Invasive and Undesirable Species Control - Management of non-native invasive species (NNIS) and undesirable beech brush will occur throughout the project area where appropriate. Methods of treatment can including manual pulling (hand crews) or the use of herbicide. The Forest conducted a Forest-wide NNIS EA (U.S. Forest Service 2010) which has reviewed the effects of herbicides on aquatic systems and has determined that some herbicides do pose a risk of toxicity to aquatic life. The Forest-wide NNIS EA recommends that only an aquatic formulation herbicide be used for treatment within stream channel buffers indicated in the Forest Plan or within 100 feet of other water bodies, otherwise, non-herbicide control methods may be used. Direct and indirect effects of herbicide use are expected to be inconsequential for aquatic and riparian resources if application of aquatic formulations of herbicide are applied following manufacturers direction.

Control of beech sprouts will incorporate preparation of the area with hand tools, and can use a combination of actions including; herbicide treatment by direct stem injection, or with a basal spray.

Pesticide use may occur in regeneration units to address hemlock woolly adelgid (HWA) infestations. Chemical treatment of HWA would adhere to manufacturer's application direction.. Crayton (2019) concluded that areas with adjacent HWA treatment using the pesticide imidacloprid had direct correlation to concentrations being found in benthic macroinvertebrates. Bioaccumulation of the substance has the potential to occur in species that comprise the higher trophic levels that consume macroinvertabrates, however, candy darter would not be considered to inhabit adjacent headwater streams where treatment would occur, thus effects of this treatment would considered a low potential of risk.

Helicopter Logging- This project will include helicopter harvest of 17 units, totaling 850 acres, that will incorporate the use of a helicopter to remove felled trees by hand crews in areas where slope or soil conditions exclude the use of conventional logging techniques as determined by the Forest Plan (U.S. Forest Service 2006). Helicopter logging represents the least amount of ground disturbance, because temporary roads are not needed to extract the timber, therefore, the issues that typically persist from temporary road creation on conventional logging operations are not present. Helicopter logging represents little to no soil disturbance for this type of action, thus, this action is expected to have inconsequential effects on candy darter or its habitat. Helicopter landings are necessary to facilitate transport out of the area, however these do not occur within the units and are analyzed as a combined action to the conventional landings, above.

Stream Crossings Road stream crossings will be evaluated as needed for maintenance to determine where crossing structures may need replaced to adequate size for passage of increased storm flows and potential aquatic organism barrier. The crossing identified, occurs on a stream

with a higher stream gradient than what is typically considered suitable for candy darter. The identified stream crossing does not fall within proposed critical habitat, however, with a proximity of approximately half mile to three quarter mile away from suitable habitat. Conservation measures will be used to reduce potential for sedimentation in critical habitat.

Potential adverse effects of stream crossing projects would primarily be limited to localized clearing of streamside vegetation as well as short-term sedimentation effects on water quality for a relatively short time after project construction. Applying West Virginia BMPs for erosion and sediment control, Forest Plan standards, and other requirements associated with project permitting under the Clean Water Act (sections 401 and 404) would substantially reduce the amount of soil loss and sediment delivery to the stream channels. Any crossing replacement site will incorporate the use of pumps to direct most water around the crossing replacement site so that work can be completed in dry conditions to reduce movement of sediment from the area. Crossing replacement would also be limited to the drier portion of the year, from the end of July to the end of September. There is no threat of variegate dater expansion to previously inaccessible habitat with the replacement of the Spencer Run crossing. When site conditions are not suitable for replacement (i.e. wet conditions, high water, etc.) then soil disturbing actions will not commence until stream and soil conditions are within a manageable condition.

Expected long-term benefits associated with stream crossing replacement projects include reducing longer-term erosion and stream sedimentation at these sites by removing the effect of flow obstruction, improving flow hydraulics, improving in-stream sediment transport processes, and reducing occurrences of erosion associated with stream banks, riparian areas, and road prisms at road stream crossings. In addition, stream crossing improvement projects will eliminate human-caused aquatic habitat fragmentation that can have pronounced impacts on the productivity and sustainability of populations of native aquatic communities.

Recognizing the priority to guard against potential risks to the genetic integrity of candy darter when contemplating stream crossing projects in the GHFR project area, long-term benefits associated with the restoration of aquatic habitat connectivity in the project area would be expected to more than compensate for potential short-term adverse effects of localized vegetation clearing and sediment production associated with construction activities at the project site.

Prescribed Fire Duration and temperature are relevant concerns of prescribed fire risk to the aquatic resources. If prescribed fire increased from low intensity to high intensity fire, it could reduce or eliminate protective vegetative ground cover which can lead to either increased soil hydrophobicity, (such as, the soil could become more water repellent), or increased erosion depending on fire temperature and soil characteristics (Gresswell 1999). Much hotter fires tend to burn more of the vegetation and leaf litter and also have the potential to kill trees. This in turn provides less of a vegetative cover and roughness over the area, which can increase erosion potential. Management of prescribed fires avoid these situations and is designed to create low temperature, efficient burns that accomplish the objective without sacrificing the integrity of the forest floor composition to capture and dissipate rain and snowfall. McNabb and Swanson (1990) concluded that generally, sediment production from fire-related activities is not a serious contributor when compared to other forest management practices, such as certain timber harvest methods and associated roads.

The prescribed burn area in the GHFR project totals 357 acres. This burn will incorporate minimum impact suppression tactics (MIST) to reduce the potential for impacts from fire line creation that may affect aquatic resources. This includes the use of hand blowers to clear fire line, or the use of existing features on the landscape, which limit the need for dozer line creation which typically involves ground disturbance. Using MIST control tactics, and implementing burns that slowly back down to riparian areas and create a mosaic burn pattern extinguishing within the riparian buffer, well before reaching the stream, it is expected that the isolated effects of prescribed fire generally pose a low risk to candy darter and proposed critical habitat. Fuel breaks and pile burns will pull slash material that is created from timber harvest activities and burn in piles away from riparian areas, which should have discountable effects to aquatic resources.

Potential Cumulative Impacts:

Atmospheric Deposition - Acid deposition associated with the GHFR project areas is an environmental condition which is likely to continue for the foreseeable future. Atmospheric acid deposition in this area is largely a by-product of coal burning power plants located to the west (upwind), which account for some of the highest rates of acid deposition in the country (Farr et al. 2009. Streams in the project area that are part of the Forest's water chemistry monitoring plan such as Windy Run, Carpenter Run, and North Fork Cherry River exhibit water chemistry that is more acidic than most other streams monitored across the Forest. This is partly due to the high rates of acid deposition and partly due to nutrient poor geologic composition which are naturally more vulnerable to effects from acid inputs. Stream acidification is not expected to improve in the foreseeable future which presents risks for native aquatic species that are less tolerant of acidic stream conditions. Aquatic biota may continue to experience population declines in the project area even where physical qualities of aquatic habitat are not lacking.

Various streams within the project area receive regular treatments of limestone from the WVDNR to help mitigate some symptoms associated with stream acidification. Limestone treatments have enabled aquatic communities in treated streams to be sustained at levels that otherwise would not exist. Limestone treatments will be continued for the foreseeable future to maintain existing aquatic populations at their current levels in these streams. Candy darter normally occur in streams with water chemistry that is circum-neutral on the pH scale. The effects of atmospheric deposition can have a pronounced effect in the future on the suitability of habitat in the project area for candy darter if current supported conditions differ.

Climate Change - Scientific models and long-term monitoring and research continue to forecast risks to the environment associated with the effects of climate change. Effects to the watershed and aquatic biota in the analysis area are likely to be associated with more erratic weather patterns that show a general warming trend for air and water temperatures, modifications to soil and water chemistry, changes to hydrology, increased frequency of disturbance, and increased stressors including invasive species and disease (Williams et al. 2015). Changes in the regional climate and conditions within the NFCR watershed would be expected to cause some level of cumulative effect to aquatic biota in this project area. This effect has not been quantified to any specific range, although effects could be assessed through long term monitoring of stream

conditions within the project area and throughout the Forest.

As regional air temperatures increase, there are concurrent changes in forest productivity and soil nutrient cycling which represent an elevated risk for cumulative effects to watershed health. Soil nitrate mobilization is a consequence of microbial activity positively related to soil temperature (Brookshire et al. 2011). Increased nitrate movement represents an increased threat to watershed acidity and stream health. Increasing air temperature along with increasing atmospheric CO2, may result in parallel increases in tree growth and nitrogen demand, which could off-set the increased nitrogen availability (Ollinger et al. 2008).

Generally, the streams in this sub-watershed have relatively good canopy cover, which helps deflect solar radiation and keep microclimates in healthy riparian areas around streams cool during even warmer days. There is less of the microclimate influence on the larger streams that receive more direct sunlight such as the main stem of the North Fork Cherry River. Temperature fluctuations may not generally be as great a concern for candy darter as it is for other native species in the project area such as brook trout (*Salvelinus fontinalis*), a management indicator species. Candy darter can be described as eurythermal (wide range of temperatures) and they tend to be more accepting of cooler and even sometimes warm temperatures. However, if water quality conditions are managed to favor brook trout and other cold water species, candy darter will likely also benefit, as there are indications in developing habitat suitability indices that candy darter are more productive and condition factor is higher in colder water environments (P. Angermeier, personal communication 02/21/2019).

Effects Determination: The determination for direct, indirect, and cumulative effects to candy darter and proposed critical habitat is **"**May Affect, Not Likely to Adversely Affect**"**. This determination is primarily a result of short-term adverse effects that are expected immediately during and shortly after the implementation of various actions associated with the GHFR project. Although certain actions have the potential to harm candy darter and impact their proposed critical habitat, the intensity of project actions will be low and lasting a short duration of time, leaving the majority of effects lasting 10 years and not constant during that period.

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Gauley Healthy Forest Restoration Project CE – Aquatics Effects Analysis

Methodology

This analysis of the Gauley Healthy Forest Restoration (GHFRP) project actions to aquatic resources will review the following proposed actions and their associated effects:

- Commercial thinning and regeneration harvest using conventional ground based logging with temporary road use
- Commercial thinning and regeneration harvest using helicopter logging
- Herbicide and pesticide use for undesirable species
- Prescribed Fire piling of logging slash created fuel breaks around high interest areas and a broadcast burn unit
- Road maintenance of existing Forest system roads
- Temporary road construction

Activity	**Units**	**Proposed Action Total**
Vegetation Management - Commercial		
Commercial Timber Harvest – Conventional Clear cut with reserve trees	8 units	242 acres
Commercial Timber Harvest – Conventional select tree thinning (without Rx burn)	57 units	1,519 acres
Commercial Helicopter Timber Harvest – clear cut with reserve trees	3 units	109 acres
Commercial Helicopter Timber Harvest – select tree thinning (without Rx burn)	14 units	741 acres
Prescribed Fire Activities		
Prescribed Fire and conventional select tree thinning		200
Prescribed Fire - Burn block (without thinning)	1 unit	157 acres
Prescribed Fire – Fuel Breaks	3 locations	16 acres
Herbicide		
Nonnative invasive treatment		
Beech brush treatment		
Pesticide		
Treatment in Regeneration units	11 units	351 acres
Roads		
Temporary road construction (haul)	25 feet	1.0
Temporary road reconstruction (haul)	25 feet	1.9
Temporary road construction (skid)	12 feet	28.6
Temporary road reconstruction (skid)	12 feet	30.4

The baseline for this analysis will be the current condition of the project area. This analysis will only analyze the new proposed actions and their potential for effects to the resource. The timeframe of effects will be a period of 10 years following project activities, which includes the implementation of project actions and expected period following which could have short term effects. Because actions of the project can have an effect to aquatic biota and habitat outside of the project area, the spatial boundary of analysis includes any 6th level Hydrologic Unit Code (HUC) watershed that falls within the project action areas. These watersheds include; North Fork Cherry River and Outlet Cranberry River (HUC: 050500050401, 050500050202 respectively). Less than 5 acres of the project fall within the Outlet Cranberry River watershed. Any ground disturbance in these 5 acres would be occurring near the ridgeline, and effects are negligible to the watershed and aquatics at that scale. The majority of this analysis will focus on potential impacts to the North Fork Cherry River watershed and its aquatic biota.

Summary

- The Proposed Action, would be compliant with the West Virginia Division of Forestry BMPs (WV Division of Forestry 2018), National Core BMP technical guide (U.S. Forest Service 2012) and Forest Plan (U.S. Forest Service 2006). Consistency with the Plan, especially relative to SW01, SW03, SW04 and RF15, relies on implementation of road and trail treatments necessary to hydrologically neutralize the effects of existing and new linear features.

Resource Impacts or Issues Addressed

Effects to watershed processes and aquatic biota are analyzed, and aquatic Regional Forester Sensitive Species and Management Indicator Species.

Aquatic Resources Analysis DRAFT – Gauley Healthy Forest Restoration CE 12/05/19			
Resource/ Issue	**Existing Condition**	**Proposed Action – Effects Determination**	**Rationale**
Threatened and Endangered Species			
Candy darter (*Etheostoma osburni*)	Proposed critical habitat within Project boundary. The candy darter is known to occur in the North Fork Cherry, South Fork Cherry and Cranberry River with species specific surveys conducted as recent as 2016 (Gibson 2017). Hybridization is expected to be the greatest threat to this species, although approximately half of the historic range of the species was lost before the threat of hybridization due to the effects of sedimentation.	May Affect, Not Likely to Adversely Affect	Project actions will adhere to Forest Plan standards and guidelines which provide mitigations to limit the effects actions have on aquatic biota. For further explanation of effects toward the species and critical habitat, please see the candy darter portion of the Biological Assessment for this project.
Aquatic Regional Foresters Sensitive Species (RFSS)			
Eastern Hellbender (*Chryptobranchus alleganiensis*)	The Eastern Hellbender is a species of fully aquatic salamander that occupies large boulders in medium to large rivers, including the North Fork Cherry and larger tributaries. Eastern Hellbender occurrence in the project area were	May impact individuals, but will not lead to a loss of viability.	The species is very dependent on exceptional water quality with high dissolved oxygen and low levels of sedimentation. The actions proposed would follow all applicable standards and guidelines and will also incorporate applicable state and national core BMP's to reduce the potential for the amount of sediment that could be introduced. This is not to say there would be no impact to the species, as

	verified by eDNA collection (Wineland 2019). Hellbender occur in larger streams where adequate large boulder habitat exists including North Fork Cherry, Dogway Fork, and main Stem Cranberry River. Population estimates have not quantified hellbender, though range-wide the population of this species is declining due to habitat loss and alteration. State-wide populations are only found in roughly 20 percent of their historic range (Keitzer et al. 2013)		short term effects during implementation could have an effect on hellbender habitat. Once ground cover is established, typically within two weeks following seeding and mulching treatment, the potential for sedimentation is greatly reduced. The actions of this project are not expected cause excessive levels of sedimentation when implementing applicable Forest plan guidance and BMPs. The use of pesticides for preserving hemlock trees from the HWA could have adverse effects on hellbenders. Crayton et al. (2019) found evidence that HWA treatment using imidacloprid occurring adjacent to stream channels had a negative effect on benthic macroinvertebrates and stream salamanders. Hellbenders could be affected by imidacloprid through dermal respiration or consumption of invertebrates. Crayfish are frequently consumed by hellbender. Although crayfish were not examined in the study, they accumulate environmental contaminants similar to macroinvertebrates. Use of imidacloprid would be limited to 20 acres of treatment totalingacres. These areas generally occur away from suitable hellbender habitat and effects of its use would be expected to be low, however, the particular effects on hellbender is uncertain. Imidacloprid use should avoid application within stream channel buffers to avoid potential negative impact to the hellbender and its forage species.

New River Shiner (*Notropis scabriceps*)	Endemic to the New River drainage of Virginia and West Virginia. This species is documented historically occurring in the Appalachian Plateau of West Virginia and is described as cool water adapted (Shingleton et al. 1981). New River shiner typically dwelling near bottom and mid-column of 2nd order and larger streams. Habitat is sandy and course gravel substrate in pools/runs of small and medium rivers. Evidence of New River Shiner occurrence in the lower Cherry river drainage apprise us of possible occurrence in the North Fork watershed (Welsh and Cincotta, 2007). New River shiner could be expected to occur in the North Fork Cherry River.	May affect individuals or habitat, but not lead towards federal listing or a loss of viability.	New River shiner are intolerant of siltation and generally avoid areas where silt accumulates (Jenkins and Burkhead 1993). Effects of actions proposed likely would not have long term persistence, however, sediment may temporarily disrupt the species habitat. Likelihood of this species occurrence in the project area is low to moderate. Ground disturbing actions including skid road, haul road creation and use and road maintenance will have the greatest potential for effects to this species, however, appropriate use of state and National Core BMPs should greatly reduce sediment.

Tonguetied minnow (*Exoglossum laurae*)	Tonguetied minnow have a historical account of occurrence in the Cherry river watershed. No species specific sampling has been conducted for this project and no tonguetied minnow have been captured in any of the annual inventory sampling conducted within the analysis area (MNF Aquatic Ecological Unit Inventory Data). This species prefers clear, cool water and avoids areas of heavy silt deposit (Jenkins and Burkhead 1994)	May affect individuals or habitat, but not lead towards federal listing or a loss of viability.	Likelihood of occurrence within the project area is low to moderate. The effect of the proposed actions, in particular ground disturbance, will be mostly short in duration and with appropriate BMP mitigations, will avoid lasting effects. The 7 miles of habitat within the North Fork Cherry River is a low proportion of the overall habitat across the Forest and the state.
Appalachia darter (*Percina gymnocephala*)	Little is known of the habitat requirements of the Appalachia darter. In a study of four darter species in streams on the Monongahela N.F., Chipps (1994) observed that Appalachia darters tended to use deeper habitats (runs and pools) than the other species. He also classified them as benthic-insectivores. Fishbase (2004) characterizes Appalachia	No effect	This species does have presence within the project boundary, however, documented occurrence only exists for the headwaters of the Cranberry River and no actions associated with this project are proposed for this watershed. There are fewer than 5 acres of identified potential actions that slightly overlap the Cranberry River watershed. These units are identified as thinning units which remove a much smaller basal area and there are only 36 feet of skid road feature, which will be an inconsequential amount of disturbance to effect water quality or the species.

	darter habitat as gravel and rubble runs and riffles of small to medium size rivers. There is no information available on temperature preferences, but the collection sites within the proclamation boundary can generally be characterized as cool to cold water systems.		
Green-faced Clubtail (*Gomphus viridifrons*)	This species has been observed in the project area, locally around the cranberry glades area, with the last observation occurring in 2002 (Forest Database). Green-faced clubtail are typically found in river systems with medium to large substrate, also near impoundments and wetland areas. Suitable river and lake habitat occur throughout the project area and species could be expected to be present.	May affect individuals or habitat, but not lead towards federal listing or a loss of viability.	Odonates are effected by actions within a watershed and within streams that disrupt the quality of the aquatic environment. Short-term effects of stream sedimentation could degrade habitat for the species. The main effect of sedimentation to odonate habitat is not considered to rise to the level of impacting populations that may occur in the project area. Green-faced Clubtail habitat in impoundments such as Summit Lake would not be considered to be affected from proposed actions, with the buffer around the water body and use of sediment and erosion control measures in place in areas upstream from the impoundment.
Rapids Clubtail (*Gomphus quadricolor*)	Rapids clubtail have been found in the higher elevation areas of the state, including Greenbrier	May affect individuals or habitat, but not lead towards federal listing or a loss of viability.	Odonates are effected by actions within a watershed and within streams that disrupt the quality of the aquatic environment. The actions of this project are not expected to create

	and Pocahontas streams with good water quality. This species has records of occurrence on larger streams and rivers. There have been no record of rapids Clubtail within the analysis area, although suitable habitat occurs and it is within the species range found in the state.		conditions that would rise to the level of measureable effects toward this species. The closest recorded occurrence for Forest heritage data of this species was in the Glady Fork watershed, however the state odentate atlas lists the mountainous areas within and surrounding the project area as suitable habitat.
Management Indicator Species (MIS)			
Brook Trout (*Salvelinus fontinalis*)	Brook trout are documented throughout this project area where water temperature and chemistry are favorable. This species is considered a cold water indicator species because of its requirement of exemplary water quality. The North Fork Cherry River has several tributaries with low pH that are not currently being augmented with limestone sand additions. Forest long term monitoring data indicate that sites monitored within the project area (Desert Branch and Hunters Run) largely show brook trout	May affect individuals or habitat, but would not lead to federal listing or loss of viability.	The effects that are typically of concern for this species are actions that alter stream or riparian conditions or when ground disturbing activity is expected. The only proposed action with potential to alter riparian or stream conditions, are forest road maintenance of a culvert crossing Spencer Run and temporary road construction that include stream crossings. Forest Plan standard and guidelines, also West Virginia BMPs will be adhered to. The main effects will come from the creation and use of temporary roads and skid roads associated with vegetation management. During use temporary roads will have sediment and erosion control measures installed, such as temporary water bars, to prevent excessive sedimentation of these areas. The greatest potential for effect would occur from the time of initial implementation of timber harvest activities, to the time the

	populations improving over time (MNF Aquatic Ecological Unit Inventory).		temporary roads are decommissioned and vegetation has reestablished
Other Habitat Components/ Watershed Processes			
Sediment production & mobility	Sediment is a product of any fluvial systems natural composition as a stream move through soil and rock, carrying material throughout the system. Anthropogenic factors from past land use create features on the landscape that often help facilitate and speed up the rate of sediment production and movement through a system. Forest monitoring locations within the project area currently show levels of sediment that are above what is considered normal and reach levels that can begin to affect brook trout reproduction.	Of the proposed project actions for the GHFR project, only the temporary road use for conventional timber harvest, road maintenance, and prescribed burn area would have the potential to disturb sediment and have the potential to increase sediment mobility.	The effects to aquatic systems vary widely from areas of ground disturbance. Areas of increased slope or high soil sensitivity to disturbance will cause greater issue to aquatics during the period of implementation and a time shortly after until vegetation is established on the road surface. The exact amount of sediment that is produced would be highly dependent on the position of the temporary road on the landscape, and its effects on the aquatic system are largely variable. Prescribed fire and fuel break treatments have little potential for effect to the aquatic system. Generally burns back down slopes into drainages and the fires expire once reaching the wet soils surrounding riparian buffers.
Hillslope Hydrology	Legacy features installed in poorly located areas or have damaged or failing erosion and sediment controls tend to have greater effect on the	New temporary road construction would occur on 29.6 miles throughout this project.	features that have been identified as reconstruction are those that currently occur on the landscape, thus effects on hillslope hydrology would not be changed with this project action. Only newly constructed temporary road features will change the

	hillslope hydrology and associated implications on aquatic systems.		existing condition on the ground and have an effect on hillslope hydrology in the project action area.
Water quantity	The analyzed watersheds are all considered headwater systems of the Gauley River watershed and streams in the analysis area have exceptional water yield in times of normal rainfall rates. Streams very rarely get to the point of being completely dry. There is a small Forest owned impoundment within the project area, Summit lake, which is a back-up reservoir for the town of Richwood in times of low flow in the North Fork of the Cherry.	A measurable change in water quantity is not expected to occur from actions of this project.	(86 percent) of timber operations would be thinning practices, which remove a small amount of the overall trees in a unit and exhibit nonsignificant changes in annual discharge (Edwards and Troendle 2012) A change in flow would be most evident at drier times of the year and may actually be slightly beneficial to maintaining residual flows.
Stream temperature	Pre-existing long-term monitoring sites within this project area help better understand the temperature regime of streams within the project area also how conditions such as riparian cover, thermal exposure, and land use throughout the		Temporary road creation uses equipment to create a cut and fill on the landscape creating the road prism. Temporary roads will be decommissioned following final use, however most of the road prism will still occur on the landscape. Storm flows that typically would infiltrate un-compacted soils will be transported over the surface to stream channels. West Virginia BMP's will be

	watershed influence water temperature, thus affecting cold water dependent aquatic communities. The riparian areas throughout the project area are generally well forested and provide excellent stream shading. The headwater streams provide cold water year round for aquatic biota dependent on it.		established water bars at proper spacing to control surficial runoff.
Riparian condition	Riparian areas within this project are generally well forested, with the exception of areas along State Route 39/55 and the North Fork Cherry river are in close proximity to one another. The riparian areas mostly consist of the same age class of trees. Natural recruitment of downed wood is still in an increasing trend toward desired conditions. Areas of lower riparian function occur upstream of project actions on the North Fork Cherry, though still in the project area, totaling approximately 18 acres.	Existing riparian conditions in the project area are not expected to improve from actions of the GHFR project. The effects of this project on riparian conditions will be minor because of the proposed actions to measurably alter riparian characteristics do not occur, except for areas where new temporary road crossings will be established. This change is not expected to have measurable effects on stream temperature or microclimate disruption.	Riparian areas have Forest Plan standards and guidelines that reduce effects of forest management activities on riparian condition and conversely the water quality conditions. Such actions that may cross riparian areas are limited to as small of a disturbance as possible. The effects of these small gaps in the overall riparian area across individual catchments are discountable because of the relative area of riparian opening across the scale of the project action area. Water conditions in the analysis area generally would see little to no change in temperature from these openings created in the Riparian. No timber harvest is allowed within the riparian buffers, so the only expected alteration would be from temporary road crossings. Two crossings on perennial streams in the Hacking Run catchment have been identified

	These large gaps in tree coverage can have impacts to thermal loading of coldwater systems.		and will total approximately 2 acres of change. The total area of perennial riparian is 50 acres, meaning there would only be 4 percent of the riparian of this drainage affected.
Stream channel conditions	Monitoring sites within the project area indicate stream channels surrounding proposed activities have been relatively stable throughout the time monitored (approximately10 years). This is because of the relatively high gradient and the large dominant substrate that is not as conducive to large changes in stream condition. This area experienced a 1,000-year flood event in 2016 which may still be affecting changes in stream channel and bankfull widths. Data collected from the long-term monitoring indicate stream sedimentation is changing through time. Sites located at Bear Run and Hunters Run indicate levels of fine	Habitat diversity within the streams across the action area is not expected to change considerably from project actions. The condition of the stream channel would only be modified at temporary stream crossings, and these crossings would be removed within 3 years of final use.	Across the entire project action area, there are only two crossings proposed on perennial streams, approximately half an acre of disturbance each. This is approximately one acre across the 3,051 acres of perennial riparian stream buffer, resulting in a minor potential for effects materialize into substantial alterations.

	sediment that is collected in suitable spawning gravel has increased. A site located on Desert Branch indicates that fine sediment has decreased in suitable spawning gravel samples. However, all samples are still above an amount of sediment that is known to impact egg survival rates of brook trout and other aquatic organisms (Edwards et al. 2007).		

Table 1: Key resource concerns, existing condition, direct/indirect effects, and rationale.

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Effects Analysis for Threatened and Endangered:

Streamlined Biological Evaluation/Assessment and Concurrence/Tiered Biological Opinion for Monongahela National Forest (MNF)
Projects Tiered to the 2006 Forest Plan Programmatic Biological Assessment and FWS Programmatic Biological Opinion.

Last Updated: June 30th, 2021

TYPE OF CONSULTATION: ☒ **Informal**
☒ **Formal (tiered process)**
☒ **Streamlined NLEB Process (Part B)**

PROJECT NAME: Gauley Healthy Forest Restoration Project (GHFR)

PROJECT LOCATION: Near Richwood, West Virginia

DISTRICT: Monongahela National Forest, Gauley Ranger District

COUNTIES: Greenbrier, Nicholas, and Webster Counties

WATERSHED(S): North Fork of Cherry River, South Fork of Cherry River, and a portion of the Cranberry

MAP(S) ATTACHED: ☒VICINITY ☒DETAILED PROJECT MAP
☒ ACTION AREA MAP

Table 1 Overall Determination of Effects for Federally Listed Species

Species	Determination
Cheat Mountain salamander (*Plethodon nettingi nettingi*)	NE
Virginia big-eared bat (*Corynorhinus townsendii virginianus*)	NE
Indiana bat (*Myotis sodalis*)	LAA
Northern long-eared bat (*Myotis septentrionalis***)**	LAA
Rusty Patched Bumble Bee (*Bombus affinis*)	NE
Candy Darter (*Etheostoma osburni*) / **Critical Habitat**	NLAA / NLAA
Shale barren rock cress (*Arabis serotina*)	NE
Virginia spiraea (*Spiraea virginiana*)	NE
Running buffalo clover (*Trifolium stoloniferum)*	NLAA
Small whorled pogonia (*Isotria medeoloides*)	NLAA

NE (No Effect); NLAA (May affect, not likely to adversely affect); LAA (May affect, likely to adversely affect).

PROJECT DESCRIPTION (Proposed Action):

Silvicultural Treatments

Hardwood Commercial Regeneration Harvest: (350 acres)

Regeneration harvest would occur in 350 acres. 242 acres would be harvested through conventional ground-based methods 108 acres would be helicopter units. Commercial timber harvest involves the use of hand or mechanical felling and removal from the forest by helicopter or skidder. Helicopter units have limited ground disturbance compared to conventional logging because it limits the need for temporary roads and skid trails. Regeneration harvests remove all trees of commercial size, except in areas designated as wildlife and riparian buffer zone.

Clearcutting (Regeneration). Forest Plan, page A2 "The clearcutting method harvests most or all of the trees within a stand in one removal. Typically, some reserve trees are left to meet wildlife habitat or other resource needs." Commercial timber harvest involves the use of hand or mechanical felling and removal from the forest by helicopter or skidder. Firewood gathering opportunities may be provided with these treatments.

Actions Connected with Hardwood Commercial Regeneration Harvest:

- ***Site Preparation***. Forest Plan page A15. Site preparation includes cutting down residual trees not reserved as part of stream buffers or wildlife reserve trees (hickory) between 1 and 5 inches in diameter during or immediately after a regeneration harvest. Normally red spruce, hemlock, dogwood, serviceberry, and shrub species that produce mast for wildlife are not cut. The resulting stand is mostly unshaded by overstory trees and contains less than 10 sq. ft. of live residual basal area, outside of any streamside buffers, in which no trees are cut.
- ***Planting.*** Forest Plan page A16. Hardwood forests normally regenerate naturally after a timber harvest occurs. Planting is sometimes used in stands to improve species diversity. Competition for sunlight, moisture, and soil nutrients is intense when a stand is regenerated. Protective tree shelters may be used to improve survival for planted seedlings and retain them as a viable component within a stand. A tree shelter acts like a mini green house, providing increased temperatures over longer time periods than in open conditions, resulting in increased survival rates and overall growth of the planted seedling. Tree shelters are also put in place to protect the seedlings from deer browsing. These potential treatments would occur during the regeneration period (typically 1 to 5 years after the harvest and site preparation).
- ***Vine Control***. Forest Plan page A16. Vine treatment would be used to prevent vines from damaging regeneration. The vine treatment would include hand cutting of most vines, usually grape or camphor, attached in the crowns of trees, prior to harvest. This treatment prevents damage to young trees from re-sprouting vines but does not affect vine regeneration from seed as an element of diversity.
- ***Insecticide Use*** - Emamectin benzoate, Imidacloprid, Dinotefuran and neem oil may be used on a maximum of 20 acres (treatment on 20 trees per acres or less) to treat emerald

ash borer, hemlock wooly adelgid, beech leaf disease and beech bark disease. Application would follow manufacturer specifications.

- ***Herbicide.*** Forest Plan page A16. This treatment would be used to control competition with diseased beech sprouts, only in stands where beech bark disease occurs and has resulted in dense competition that excludes tree and understory species. In most cases, it is be possible to control competition with diseased beech sprouts by cutting alone, as described in *Site Preparation*. Diseased American beech trees should not be left standing in regeneration cuts, since the resulting diseased beech thickets are not a desired outcome of the treatment. For herbicide treatment of diseased beech, herbicides would be applied to individual stems by stem injection (cut surface treatment) or basal spray, both methods using manual labor
- ***Crop tree release.*** Forest Plan page A16. This non-commercial treatment within clear-cut stands using hand labor would occur in regenerated stands following harvest to retain diversity of species, develop mast producing trees for wildlife; and increase commercial value. Approximately 50 trees per acre of good health and form are released from competing vegetation by cutting or girdling nearby trees (<5" diameter) that touch the crowns of the selected trees. This treatment is a light thinning, leaving many more young trees on site than the 50 trees that are targeted for release. Crown closure normally occurs in less than 5 years.

Hardwood Commercial Thinning: (2462 acres)

Commercial thinning would occur on 2462 acres. 1721 acres would be harvested through conventional ground-based methods (with or without prescribed burning) and 741 acres are helicopter units. Helicopter units have limited ground disturbance when compared to conventional logging as it limits the need for temporary roads and skid trails. Thinning treatments remove 1/3 of the basal area from overstory and midstory trees. The proposed timber harvest and associated tasks could take from 3-5 years to complete and would not take place all at once.

Thinning. Forest Plan, page A2 "The thinning method is an intermediate cut that… removes high risk… low quality, diseased, and over mature trees to increase the health, development, and growth of the residual trees in a stand… Thinning is applicable to all of the forest types found on the Forest."

Actions connected with thinning:

- ***Vine Control***. Forest Plan page A16. Vine treatment would include hand cutting of most vines, usually grape or camphor, attached in the crowns of trees, to reduce the deformity, broken treetops and slowing of growth and susceptibility to insects and disease.

Prescribed Burning

Prescribed Fire: Broadcast (357 acres)

The project would be implemented during either the Spring (prior to green-up) or Fall (dormant) seasons to promote fire adapted species and to reduce leaf litter and the threat of uncharacteristic

wildfire. A low to moderate fire intensity would be used to reduce leaf litter while maintaining fire adapted overstory trees. The result of this prescribed fire project would be to create a healthy forest by reducing dead woody debris, increasing sunlight by reducing competition from fire intolerant tree species, promoting native grasses, increasing oak regeneration, and increasing wildlife populations. Natural features such as roads, streams, and rivers would be used as much as possible to limit the impact on the land. In instances where handlines need to be constructed Minimum Impact Suppression Tactics (MIST) techniques would be used. The concept of MIST is to use the minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response. In some cases, MIST may indicate where cold trailing or wet line may be more appropriate than constructed handline. Individual determinations are dependent on the specific situation and circumstances of each fire. Prescribed fire would be implemented in this area periodically until resource objectives are meet.

Actions Connected to Broadcast Prescribed Fire:

- ***Fire lines.*** These are natural or constructed barriers used to stop a fire from spreading. Construction of fire lines may be accomplished with leaf blowers, hand tools, and/or rakes. Natural features (drainages, creeks, cliffs) and manmade features (roads, trails) could also be used as fire lines.

Fuel Breaks: **(16 acres not covered in other harvest, 75.5 acres total)**

Fuel breaks are used to create defensible space in the event of wildfire. Mechanical fuel breaks would be constructed along portions of private property and Forest Service infrastructure (around Summit Lake and Richwood) and would be treated with thinning for the purpose of fuel reduction. This mechanical fuel break would consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees within 100 feet of private property or Forest Service infrastructure. Slash created from harvest operation would be mechanically or hand piled and burned or pulled away from private property or Forest Service infrastructure by the contractor approximately 100 feet from property boundary. Fuel breaks would be created and maintained by using chainsaws, prescribed fire, and/or mowing. Prescribed burning may be used within fuel breaks to reduce fuel loading of brush, shrubs, and trees while encouraging the growth of fire adapted species. These fuel breaks would create defensible space in the event of a wildfire in the vicinity. The fuel breaks would be evaluated periodically for effectiveness of the defensible space and to determine if future treatments are needed.

Actions Connected to Fuel breaks:

- ***Piles.*** Treatment consists of creating hand piles along private property boundary and Forest Service infrastructure would reduce logging slash and woody debris created from the thinning project within the fuel break areas. Piles would consist of top wood and non-merchantable wood. Piles would be burned during low or moderate fire danger days when either snow is on the ground or when there is enough moisture in the soil to prevent the spread of fire. No handline would be constructed for hand piling. Piles may be

constructed whenever there is a change in fuel loadings that may influence the effectiveness of the fuel break. An example of this would be a weather event that blows down trees within the fuel break.

Non-Native Invasive Species

Existing and new infestations of high-priority nonnative invasive plants in proposed activity areas would be treated before, during, and after project implementation. Treatment methods would include hand-pulling, mowing, grubbing, biological control, and herbicide application. Species that may be controlled as well as herbicides that may be used can be found in the 2010 Forest-wide Nonnative Invasive Plant Management Project Environmental Analysis (page 2-7). Any treatment of NNIS within the Gauley Healthy Forest Restoration project area would tier to the Forest-wide Nonnative Invasive Plant Management Project. All design criteria, mitigation measures, and monitoring requirements listed in Chapter 2 of this analysis (page 2 to 15 through 2 to 20) would be followed.

Transportation

Maintenance of System Roads: (19.1 acres)

Road maintenance would occur as needed on system roads within the project area to provide for egress and ingress in case of fire and for firefighting as well as timber haul. Maintenance includes mowing, grading, cleaning, or replacing culverts, and applying surface material. Some culvert replacements are at stream crossings, such as the one on FR 946 where it crosses Spencer Run. Road maintenance also includes removing hazard trees (using commercial sale methods where practical) that may fall and block the road access and thinning the canopy across and along roads so they can act as fuel breaks (Forest Plan RF11). Of the total proposed maintenance of system toads, 13.8 miles are outside of disturbance areas.

Construction & Reconstruction of Temporary Roads (94.6 acres total)

Temporary road construction provides access to timber harvest and prescribed fire related actions. Cut trees would be moved to the log landing (skidding) along temporary roads that are constructed between the cut trees and the log landing within each harvest unit. Other temporary roads are constructed and used for hauling logs from the landing to locations for processing. Temporary roads used for skidding products to the landing are 12 feet wide, and temporary roads used for hauling (highway vehicles, trucks) are 25 feet wide. Temporary roads for hauling would included several short spur routes to access landings from system roads.

Temporary roads are generally constructed with a dozer or similar equipment to blade a route with cut and fill slopes, then providing for water crossings during use, and decommissioning after use. Temporary roads used for hauling products may also involve gravel surfacing. Table 3 lists mileage and acreage of temporary roads by location (within or outside of disturbance or harvest areas) and type. Roads to be reconstructed are located on previously used features where cut and fill slopes and travel surface are already present. Road reconstruction consists of improvements to the original surface material and constructing drainage features. In some cases, some realignment of the road may be necessary.

Temporary roads for hauling or skidding are not anticipated to be needed on very steep slopes (more than 50 percent). Building or using temporary roads on steep slopes (40 to 50 percent) would be avoided where possible. If during implementation, operation on steep slopes (40 to 50 percent) is found to be necessary, operation on these slopes shall be analyzed on a case-by-case basis to determine the best method of operation while maintaining soil stability and productivity according to standard SW07.

Temporary water bars are put in between periods of active use. Temporary roads are generally closed with dips, water bars, and seeded with a Forest Service approved seed mixture following the completion of harvesting activities. Additional treatment (such as re-establishing drainage, decompaction or re-sloping) to address resource issues could be used if needed Temporary roads would be decommissioned and restored within 3 years of the end of project activities as required by the Section 603 of HFRA (16 U.S.C.6591b) (FSH 1909.15, 32.3(3)). Decommissioning methods used for temporary roads should allow for fuel reduction by brushing to retain defensible space, where appropriate. Decommissioning methods for temporary roads built on existing linear wildlife openings should consider the need to retain defensible space as well as maintenance of wildlife and pollinator plantings after use. Decommissioning of temporary roads used for both hauling and skidding would follow guideline RF13. The road profile should not normally be returned to contour during decommissioning. Decommissioning should also allow for treatment of non-native plant species, as appropriate.

Landings:

Cut logs would be temporarily stored in landing areas before loading onto trucks for transport. Landings are generally cleared of standing trees, stumps, and leveled with a heavy equipment to form a place to store logs until they can be loaded and removed from the site. There are 40 total proposed landings. Conventional landings are 0.5 acres. Helicopter landings are 2 acres. Back blading, leveling, or similar activities will be utilized to ensure positive drainage and seeding (approved seed mixture) and mulching to establish ground cover. View Table 2 for details.

Table 2 Landing Zones

Disturbance	Type	Number	Acres	Number outside disturbance area	Acres outside disturbance area
New	Helicopter	4	8	1	2
New	Conventional	13	6.5	2	1
Existing	Helicopter	3	6	3	6
Existing	Conventional	20	10	7	3.5
Total	Landings	40	26	13	12.5

Table 3 Proposed Temporary Roads

Type of Road	Total Mileage	Approx. Acreage	Miles outside disturbance areas	Acres outside disturbance areas
Temporary road construction (25 feet)	1.0	3.0	.6	1.8
Temporary road construction (12 feet)	28.6	41.6	1.4	2.0
Temporary road reconstruction (25 feet)	1.9	5.8	.7	2.1
Temporary road reconstruction (12 feet)	30.4	44.2	4.7	6.8
TOTAL	**61.9**	**94.6**	**7.4**	**12.7**

Table 4 Activity and Treatment Acreage Summary for Proposed Action

Treatment	Total
Thinning, using ground-based logging, without prescribed burning	1521 acres
Thinning, using helicopter logging, without prescribed burning	741 acres
Prescribed burning and thinning using ground-based logging	200 acres
Prescribed burning (without thinning)	157 acres
Regeneration harvest, using ground-based logging	242 acres
Regeneration harvest, using helicopter logging	108 acres
Fuel break, not included in other timber harvest in 3 locations	16 acres
New landings inside timber units	11.5 acres
New landings outside timber units	3 acres
Temporary road construction and reconstruction	61.9 Miles
Herbicide – overlapping treatment with regeneration harvests	Up to 350 acres
Insecticide – overlapping treatment with regeneration harvests	Up to 20 acres

Mitigation Measures

PROJECT STATEMENTS (Check all that apply and provide additional information as necessary.)

☒ All applicable standards and guidelines will be followed during implementation of this project.

☐ The following standards and guidelines cannot be followed (include a reason in a bullet list below):

☐ The following mitigation/minimization measures will be applied during implementation of this project and are part of the proposed action under consultation:

Table 5 Species List

Generated in Information for Planning and Consultation tool (IPaC) (https://ecos.fws.gov/ipac/)/Other FS data). Surveys for bats are done in accordance with the Reasonable and Prudent Measures of the 2006 Programmatic Biological Opinion and in consultation with the USFWS, Elkins, WV Field Office. List ONLY the species/critical habitat within the action area (or high potential to be in the area):

Species/Critical Habitat/High Potential for Bats	Data Source(s): (IPaC, MNHD, Surveys, Other)	Status in Action Area (2.5 Mile Buffer)
Indiana bat (*Myotis sodalis*)	BatRoostDataDraft2003_2019_01312020 MNFMistnetTemp1997_2019_01302020 Ibat_cave_5mi_circle_n83_072606 Ibat_vbeb_caves_n83_072606	Present in action area, with 9 confirmed captures, based on 2000-2019 mist-net data. 13 confirmed roosts within project area. No known maternity roosts within action area, with the closest known maternity roost being 68 miles from the proposed disturbance area. No known hibernacula, closest known hibernacula are 10.8 miles from disturbance area. The action area is outside any 5-mile primary range or key area.
Northern long-eared bat (*Myotis septentrionalis***)**	BatRoostDataDraft2003_2019_01312020 MNFMistnetTemp1997_2019_01302020 NLEBhib_WvDnrCaves_0605 MonongahelaNF_NLEB_known_hib_090715	Present in action area, with 200 confirmed captures based on 2000-2019 mist-net data. No known roosts or maternity roosts within the action area, with the closest maternity roost being 24.4 miles from the proposed disturbance area. The closest known hibernacula are 10.8 miles from the proposed action.
Candy Darter (*Etheostoma osburni*) / **Critical Habitat**	West Virginia Division of Natural Resources Heritage Surveys, Forest Service Aquatic Monitoring Surveys	Recent evaluation of candy darter range and speciation has helped to identify streams where extant candy darter populations still occur, where variegate darter are hybridizing with candy darter, and where there is relative robustness of remaining intact populations of candy darter (Switzer et al. 2008; Gibson 2017). The meta-population in the Upper Gauley watershed (which includes the GHFR project area) is suspected to be genetically pure, although genetic analysis of a few sampled individuals revealed the presence of variegate darter alleles (Gibson 2017). Summersville Lake dam functions as an effective physical barrier to upstream migration of fish that occur in the lower Gauley River, including variegate darter. Critical habitat within Project boundary. The candy darter is known to occur in the North Fork Cherry, South Fork Cherry and Cranberry River with species specific surveys conducted as recent as 2016(Gibson 2017). Hybridization is expected to be the greatest threat to this species, although approximately half of the historic range of the species was lost before the threat of hybridization because of sedimentation (USFWS, 2018).
Running buffalo clover (*Trifolium stoloniferum)*	Botanical surveys, West Virginia Division of Natural Resources' Natural Heritage BIOTICS database, Forest Service TESP-IS database	Existing records show that the nearest known occurrence of running buffalo clover is located along a Forest Service road, approximately 9 air miles northeast of the project area. The likelihood of occurrence for running buffalo clover is considered low because it is not known to occur near the project area, and botanical surveys in the project area did not locate it.
Small whorled pogonia (*Isotria medeoloides*)	Botanical surveys, West Virginia Division of Natural Resources' Natural Heritage BIOTICS database, Forest Service TESP-IS database	The likelihood of occurrence for small whorled pogonia in the project area is considered low because it is not known to occur near the project area, and botanical surveys in the project area did not located it. However, the potential occurrence cannot be completely ruled out based on habitat preferences and due to the difficulty of locating this species using conventional survey techniques.

Analysis of Effects:

☒All effects are consistent with the effects analysis in the 2006 Forest Plan/PBO and subsequent analyses. (See Appendix A and the literature cited for list of documents and page numbers for references used in this tiered analysis). These effects are summarized in Table 6.

☐The may affect but is not likely to adversely affect the Northern long-eared bat (NLEB). No additional forms are necessary. See Table 6 for a summary of effects and Table 1 for the determination of effects rationale.

☒The project is likely to adversely affect the NLEB. Consultation for this species will use the optional streamlined consultation framework under the under the 2016 Programmatic Biological Opinion for the Final 4(d) rule. Any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. The streamlined consultation form for NLEB is attached in Appendix A.

☐ The NLEB will be affected by this project and some activities are not exempt under the 2016 Programmatic Biological Opinion. An analysis of effects is described below in detail:

Table 6 Site Specific Analysis of Effects Summary for Threatened and Endangered Species

Species	Proposed Action (List all activities)	Season/Life Stage Impacted	Concise Effects Analysis
Indiana bat, Northern long-eared bat	Regeneration Harvest, Temporary roads, Site preparation, Vine control, Log landings.	Active Season	Foraging and roosting habitat would be disturbed. The cutting of live trees would alter current habitat conditions converting mid to late successional forest to early successional. Removal of trees may result in direct mortality or harm if in occupied habitat. Indirect effects associated with habitat modifications may also disrupt breeding, feeding, or sheltering behaviors. However, no breeding habitat is known to occur within the action area. Harvesting dead and dying trees during the active season could result in the loss of occupied roosts potentially injuring, killing, or disturbing individuals. Foraging opportunity would be improved by enhancing the herbaceous understory which would likely increase the insect population upon which these species prey. Both species are present in action area, however no NLEB roosts have been discovered and no known Indiana Bat maternity roosts have been discovered in the action area. Retention of snags (TE 24) would help retain potential or suitable roost trees for both species. There are no known hibernacula, primary range, or key area within the action area. Effects of harvest activities are analyzed in depth on pages 51 to 56 of the 2006 MNF PBO.
	Thinning, Temporary roads.	Active Season	Similar effects as programmed regeneration harvest; however, most of the over-story would remain intact, limiting potential effects to roosting and foraging habitat. Effects of harvest activities are analyzed in depth on pages 51 to 56 of the 2006 MNF PBO.
	Prescribed fire Broadcast Fire lines Burn Piles	Active Season, Hibernation, or migration	There are no known Indiana bat or Northern long-eared bat hibernacula within the project action area. Prescribed fire would be implemented within the appropriate burn windows as prescribed with the applicable burn plan, minimizing the potential for direct effects to roosting bats as most would be hibernating or would be migrating and non-volant bats would be less likely to be present on the landscape. *Broadcast burning*

			would be restricted from June 1st to July 31st as an additive mitigation measure to eliminate potential impacts during the pup season and to non-volant bats. Smoke effects would be managed and would not pose a threat to bats, because the nearest hibernacula are 12.4 miles to the east. Fire lines are constructed during the hibernation season. Prescribed fire can benefit bat habitat by creating additional snags on the landscape and by creating conditions that stimulate growth in the understory. Some snags could also be burned or removed during operations (line construction or implementation) if they become a safety hazard. Most snags would remain on the landscape post-burn. Effects of burning activities are analyzed in depth on pages 57 to 59 of the 2006 MNF PBO.
	Fuel Breaks	Active Season	Additional acres of potential roosting and foraging habitat disturbed. Same impacts as analyzed in the harvest section. Effects of harvest activities are analyzed in depth on pages 51 to 56 of the 2006 MNF PBO.
	Temporary roads	Active Season, Hibernation, or migration	Trees may be removed during the process and some may be suitable as roosts for Indiana or Northern long-eared bats. This would have similar effects as programmed regeneration harvest. Effects of road related activities are analyzed in depth on page 56 of the 2006 MNF PBO.
	Herbicide	Active Season, Hibernation, or migration	Herbicides have known impacts on Lepidoptera larvae and other insects, the primary food source for Indiana bat and Northern long-eared bat. However, based on the scope and scale of these activities these impacts are minimal within the action area. Application is to beech trees only and applied to individual trees.
Running buffalo clover	Thinning, Regeneration Harvest, Temporary roads, Site Preparations, Log Landings, Prescribe Fire, Fuel Breaks, Burn Piles.	Growing Season	Surveys for running buffalo clover were conducted in all the proposed activity areas that would involve soil disturbance and/or removal of 20 percent or more of the overstory in mature stands. Field surveys covered areas proposed for commercial timber harvest, temporary road, and landing construction, prescribed fire, and fuel break establishment. Surveys were conducted by experienced botanists and covered representative habitats in all parts of the activity areas, with the goal of traversing 100 linear feet per acre of activity area on average. Field surveys were conducted in 2020 and 2021. All surveys were conducted between May 1 and September 30, inclusive, which constitutes the active growing season for threatened and endangered plants that are known to occur on the Monongahela National Forest. Running buffalo clover is not known to exist in any of the proposed activity areas. Therefore, direct effects on running buffalo clover are not likely to occur. If any undiscovered occurrences of running buffalo clover exist in proposed activity areas, effects could occur. Potential habitat could be impacted but such effects on habitat would not translate into actual impacts on running buffalo clover unless undiscovered populations exist. The open canopy created in regeneration units likely would lead to running buffalo clover being out-competed by sun-loving herbs, shrubs, and saplings. Beneficial effects could occur in thinning units due to the partial opening of the canopy. If any undiscovered occurrences of running buffalo clover exist within temporary road and landing sites, they could be damaged or eliminated. In conventionally yarded thinning units, the soil disturbance due to skidding could benefit running buffalo clover by

			providing a suitable habitat for it to colonize. Temporary road construction and reconstruction could also create additional habitat. The possible effects outlined are considered unlikely due to the low probability that any undiscovered occurrences of running buffalo clover exist. Therefore, the potential for adverse effects is considered discountable.
Small whorled pogonia	Thinning, Regeneration Harvest, Temporary roads, Site Preparations, Log Landings, Prescribe Fire, Fuel Breaks, Burn Piles.	Growing Season	Surveys for small whorled pogonia were conducted in all the proposed activity areas that would involve soil disturbance and/or removal of 20 percent or more of the overstory in mature stands. Field surveys covered areas proposed for commercial timber harvest, temporary road, and landing construction, prescribed fire, and fuel break establishment. Surveys were conducted by experienced botanists and covered representative habitats in all parts of the activity areas, with the goal of traversing 100 linear feet per acre of activity area on average. Field surveys were conducted in 2020 and 2021. All surveys were conducted between May 1 and September 30, inclusive, which constitutes the active growing season for threatened and endangered plants that are known to occur on the Monongahela National Forest. Small whorled pogonia is not known to exist in any of the proposed activity areas. Therefore, direct effects on small whorled pogonia are not likely to occur. If any undiscovered occurrence of small whorled pogonia exists in the proposed activity areas, effects could occur. Potential habitat could be impacted but such effects on habitat would not translate into actual impacts on small whorled pogonia unless undiscovered populations exist. Commercial regeneration harvest, temporary road and landing construction, and prescribed fire have the potential to damage or eliminate small whorled pogonia. The effects of thinning harvest on small whorled pogonia are difficult to predict but may have a beneficial effect due to the partial opening of the canopy. Small whorled pogonia is not likely to be affected by road maintenance which would be limited to the existing footprint of heavily traveled roads that are not likely to support small whorled pogonia. The possible effects outlined are considered unlikely due to the low probability that any undiscovered occurrences of small whorled pogonia exist. Therefore, the potential for adverse effects is considered discountable.

Effects Analysis not covered in the 2006 Forest Plan/PBO:

Candy Darter:

Potential Direct and Indirect Impacts to Candy Darter and Designated Critical Habitat in the Project Area:

The proposed action would utilize 61.9 miles of temporary roads for access to timber actions and prescribed fire activities (Table 3). 0.3 mile of the 19.1 miles of temporary road reconstruction and use is within one quarter mile of candy darter critical habitat.

West Virginia standard Best Management Practices (BMPs), National Core BMP Technical Guide FS-990a (U.S. Forest Service, 2012), Forest Plan guidance (U.S. Forest Service, 2006), and other project design features would reduce short-term adverse effects of project activities relating to the temporary road system. Direct and indirect effects to candy darter and critical habitat from temporary road creation for vegetation management actions (thinning and regeneration harvests) include a low to moderate risk for impacts associated with stream sedimentation and altered watershed hydrology; this risk would occur primarily during active project implementation and a brief period there-after (up to 3 years).

Timber harvesting, road maintenance, temporary roads, and log landings are ground disturbing activities that may alter surface and subsurface hydrology and possibly increase sediment delivery to streams. Changes such as these could affect soil and water quality and degrade physical characteristics of aquatic habitats including those associated with critical habitat for candy darter within the GHFR project area. The extent of effects is largely influenced by the amount and type of the ground disturbance, soil characteristics, topography and landform, proximity to stream channels, pre-existing conditions of the receiving channels, and effectiveness of design features and mitigation measures associated with project activities.

Table 7 displays percentages of fine sediment for streams within the project area. Adverse effects to aquatic biota (i.e. trout) are documented in MNF streams when the percentage of fine sediment <1mm is greater than approximately 5% (Edwards et al. 2007). In 2019, Hunters Run documented (% Fines<1mm) are greater than 5%. Additional accumulations of stream sedimentation could further impact habitat qualities. Suitable candy darter habitat is not found within these sampled systems, however this information gives insight to overall watershed conditions. Temporary roads pose the largest potential for risk for sediment entering adjacent streams of the actions proposed. Sedimentation could cause displacement, reduced feeding success, and increased respiration for candy darter. However, temporary roads makes up only 3.6% of land disturbance activities and is not anticipated to cause adverse impacts to the candy darter, following state and Federal BMPs limiting sediment delivery.

The Monongahela Land and Resource Management Plan has established standards and guidelines to reduce the potential for effects to water quality and aquatic biota during Forest actions. For example, Forest Plan standard SW37 defines buffer widths for perennial, intermittent and ephemeral stream channels that are incorporated by reference in other Forest Plan standards to help protect stream resources from potential project impacts (including soil

disturbance and erosion). Forest Plan standard SW34 prohibits programmed timber harvest or any tree removal from stream channel buffers (with few exceptions). Forest Plan standard SW40 requires skid trails/roads and landings to maintain a filter strip of at least 100 feet from all stream channels. Project actions include decommissioning of temporary roads in accordance with Forest Plan standard RF15, and address maintenance needs on existing Forest System roads within the project area.

Table 7 Water Chemistry and Stream Condition Summary of Monitoring within the GHFR project area

Stream	*Sample Date*	*pH*	*Conductivity – uS/cm*	*ANC – ueq/L*	*% Fines < 4mm*	*% Fines < 1mm*
Coats Run	3/25/2019	6.86	18.6	71.23	-	-
Coats Run	9/24/2019	7.12	29.7	221.84	-	-
Hunters Run	4/2/2018	6.39	16.3	42.41	33.28 (AEUI 2019)	14.33 (AEUI 2019)
Hunters Run	9/24/2018	7.08	31.3	193.3	-	-
Desert Branch	3/28/2017	5.45	16.1	21.56	15.82 (AEUI 2016)	9.86 (AEUI 2016)
Desert Branch	9/12/2017	5.64	16.5	23.16	-	-
North Fork Cherry River, lower	4/2/2018	6.60	29.1	67.82	-	-
North Fork Cherry River, lower	9/24/2018	6.75	22.6	93.28	-	-

Conventional Timber Harvesting - Timber harvesting for this project includes regeneration harvesting prescriptions, and thinning prescriptions remove approximately 1/3 of the standing basal area of timber in target stands. Roads, landings, and skid roads are necessary to implement these prescriptions using conventional harvest methods. Each of these activities require ground disturbance that can impact hydrology, riparian, and aquatic resources to various degrees depending on variables including aspect slope and soil type. Roads and landings would be evaluated after their near-term use to identify locations that require further action, consistent with ongoing restoration efforts, to get the area to a watershed stable condition, these include additional spot treatments of decompaction, recontour, or seeding to establish ground cover. Disturbance of the forest floor and ground cover in the general treatment unit area (i.e. excluding haul roads, skid roads, or landings) is generally dispersed and not concentrated, and consequently has a much lower probability for impacts to hydrologic and aquatic resources. Soil disturbance typically only occurs at landing sites and where temporary roads (mainly skid roads) are created. Compaction is typically not an issue throughout the harvest unit because the harvesting is not concentrated and heavy machinery is not repeatedly trampling the same area (except for on landings and temporary roads).

Water Yield - Annual water yield conveyed by streams is influenced by numerous environmental factors including rates of evapotranspiration associated with contributing watershed areas. Removing trees can reduce rates of evapotranspiration and consequently increase water yield transported by streams. Watershed studies in eastern deciduous forests in Appalachian regions found measurable increases in water yield when approximately 20-25% of the basal area of standing timber is removed from contributing watershed areas (Hornbeck, *et. al*., 1993; Stuart, Edwards, 2006). Increases were most apparent in the first few years after harvesting and were virtually nonexistent after approximately 5-10 years post-harvest in these studies. Increases were found to be measurable only during base flow or low flow conditions, potentially having a slight benefit.

Therefore, negative effects to candy darter and critical habitat from water yield variations are unlikely to occur. Additionally, the relatively small catchments that could experience increased water yields because of timber harvesting are located higher in the watershed, upstream from or outside of suitable candy darter habitat. Potential effects associated with increases in water yield from these small headwater streams are expected to dissipate as the smaller streams flow into increasingly larger receiving channels downstream where suitable candy darter habitat exists.

Water Chemistry - Most streams in the GHFR project area are currently impacted by relatively high rates of atmospheric acid deposition. This area of the forest faces high soil and water acidity because of the acid rain produced by coal burning power plants to the West; Cherry River watershed has some of the highest rates of acid deposition in the country (Farr et al. 2008). Stream acidification within this project area is a function of the watersheds being predominantly composed of soils and underlying geology that are highly vulnerable to the effects of the high rates of atmospheric acid deposition. Streams with an acid neutralizing capacity (ANC) of values nearing 0 are not able to buffer acid deposition and stream acidity as well as streams with an ANC value of 100 or more. Most streams in the project action area have high values because of limestone treatments higher in the headwater (Table 7). Applications of limestone are routinely applied by West Virginia Division of Natural Resources to various streams in the project area to help mitigate some effects associated with acid deposition. These limestone additions are shown to provide stable pH conditions in the North Fork Cherry River over the past decade (Table 7 shows most recent Forest water chemistry data). Desert Branch displays lower ANC values due to the absence of limestone treatment in this catchment. New disturbances could provide short-term reductions to stream pH and ANC because of organic layer removal from temporary roads and landings. This is expected to be reduced through project design including Forest Plan standard RF15 stating that temporary roads used would be rehabilitated and returned to productivity following use. A return to productivity is achieved through reestablishing the vegetation layer and drainage patterns. Therefore, effects from project actions on pH or ANC conditions of candy darter critical habitat are expected to be negligible.

Forest System Roads Maintenance - No new classified Forest system roads would be constructed in this project. System road maintenance of 19.1 miles is proposed. Existing system roads have been identified to receive maintenance as needed, considering the purpose of the road, types of vehicles expected, duration and frequency of use, and environmental conditions currently

causing resource concern. The type of maintenance that could occur includes mowing, grading, cleaning, or replacing cross drain culverts, and applying gravel to the surface. Grading and cleaning ditches and culverts are maintenance actions expected to have increased sediment delivery potential. Increased potential would be short in duration occurring when the action takes place until proper road surface is applied, within 2-3 weeks. Long-term road maintenance is expected to be a beneficial action to reduce sediment delivery from existing roads lacking current maintenance. 0.3 miles of road maintenance occurring within one quarter mile of critical habitat falls outside of the 100 foot stream buffer and appropriate BMPs would be applied, such as silt fence and filter sock at the edge of road disturbance. Maintenance of Forest System roads associated with this project are unlikely to adversely affect the existing condition of the aquatic ecosystem in the project area. Road management actions that are key to facilitating the expected results for candy darter include compliance with Forest Plan standards (e.g. SW35, RF04, RF07, and RF15) and National core BMPs to control the potential for adverse effects during road maintenance activities.

Table 8 Drainage Catchments with Proposed Road Maintenance.

Stream Catchment	Catchment Size (square miles)	Road Maintenance (miles)	Stream Crossings
Spencer Run	0.85	0.58	1
Desert Branch	1.51	3.8	1
Hacking Run	0.84	0.4	1
Hunters Run	3.38	4.3	1
Coats Run	1.55	4.1	2
Little Lick Run	1.34	1.2	0

Landings - Log landings are necessary for timber harvesting activities. Short-term effects related to the construction and use of landings would expose soil and may produce sediment. Application of West Virginia BMPs, National Core BMP direction (Veg. 6) and design features would be used to limit potential effects associated with stream sedimentation coming from these sites. For example, the Forest Plan direction (Standard SW 40) requires that all landings be located at least 100' from any stream channel (perennial, intermittent and ephemeral) and to stabilize them upon completion of their intended use following the project. Treatments necessary to stabilize landings include vegetative ground cover and possibly other measures including regrading, soil de-compaction, and soil amendments (such as fertilizer and lime). The creation and use of these landings would follow direction as identified in the National Core BMP Technical Guide.

Temporary roads - Temporary roads are a necessary component for timber harvesting within the project area. Temporary roads, like any classification of road (Forest System roads) on landscapes similar to the GHFR project area, typically interact with the natural environment in ways that can adversely affect watershed conditions and processes, such as soil compaction, altered hillslope hydrology, and accelerated water movement. Soil damage associated with roads

includes removal of organic layer and topsoil, soil compaction, and erosion of exposed soil. Soil damage affects hillslope infiltration and surface and subsurface flows (Kolka 2004). In addition, roads can function as an extension of stream channel networks further altering natural hydrologic flow patterns for both surface water and shallow groundwater. Kochenderfer (1977) found that constructed or bladed skid roads occupy about 10% of timber harvest areas in steeper terrain (~10-45%); Stuart and Carr (1991) estimated the percentage to be more than 20%. The project is expected to use 59 miles of temporary skid road (12 feet) for the removal of trees from harvest units, of these, 28.6 miles would be newly constructed roads. The remaining 30.4 miles are currently existing features on the landscape that would be reused for projects activities. 2.8 miles of temporary road (25 feet) would be utilized as haul roads. These features contain surfacing material instead of operating on native material.

Temporary roads proposed would make up approximately 3% of the timber harvest areas. In consideration of the nature and extent of potential watershed-scale effects from accumulations of partially mitigated temporary roads through time, ground-based skidding can represent considerable alteration to natural landscapes and its inherent ecological condition and function. View Table 3 for proposed temporary road details. Temporary roads would be a small percentage within the 2,831 acres of timber harvesting activities, and changes to the existing condition can be expected primarily in the short-term during implementation and until temporary roads are treated with decommissioning.

Existing temporary roads occurring within the stream buffers that would be used for this project were verified in the field as routes that would be expected to have less consequential effects than other possible routes on steeper slopes. The risk of sediment delivery cannot be completely avoided, however, these temporary roads would incorporate mitigations to minimize impacts to stream conditions (e.g. silt fence, proper road surfacing, drainage culverts).

Decommissioning would occur within three years of final project actions. The method of decommissioning temporary roads and skid roads would consist of treatment with customary BMPs such as removing temporary crossings and culverts, establishing protective ground cover, and installing water-bars of appropriate spacing and design to reduce potential adverse watershed impacts. Decommissioning actions are outlined in Forest Plan guideline RF13, parts a-e. The greatest potential for erosion and sedimentation occurs the first-year post-harvest and generally decreases each year after that. Edwards and Williard (2010) found that the application of appropriate BMPs have been shown to be 53 to 94% effective at reducing sediment in the first year after harvesting.

Temporary road BMP practices that would be used as listed in the National Core BMP Technical Guide (U.S. Forest Service, 2012) include:

- Use applicable practices of BMP Road-2 (Road Location and Design) to locate temporary roads
- Use applicable practices of BMP Fac-2 (Facility Construction and Stormwater Control) for stormwater management and erosion control when constructing temporary roads
- Install sediment and stormwater controls before initiating surface-disturbing activities to the extent practicable

- Schedule construction activities to avoid direct soil and water-disturbance during periods of the year when heavy precipitation and runoff are likely to occur
- Routinely inspect temporary roads to verify that erosion and stormwater controls are implemented, functioning, and appropriately maintained
- Maintain erosion and stormwater controls as necessary to ensure proper and effective functioning
- Use suitable measures in compliance with local direction to prevent and control invasive species
- Use temporary crossings suitable for the expected uses and timing of use (See BMP Road-7 [Stream Crossings])
- Use applicable practices of BMP Road-6 (Road Storage and Decommissioning) to obliterate the temporary road and return the area to resource production after the access is no longer needed

Best Management Practices (BMPs) are standard operating procedures intended to avoid or minimize unwanted impacts (i.e. sediment delivery). BMPs are assumed to be readily implementable and have a high probability of success when correctly implemented. All relevant BMPs from the National Best Management Practices for Water Quality Management of National Forest System Lands – Volume 1 (USFS 2012) and West Virginia Erosion and Sediment Control Best Management Practices Manual (WVDEP 2006) would be implemented to minimize sediment delivery from project activities. Corrective actions in the form of enhanced erosion protection measures would be taken where needed. Corrective actions can be identified at any time during implementation or after until final mitigations have been completed. Results from erosion and sediment studies and monitoring indicate BMPs are effective in minimizing sediment delivery (Hornbeck and Kochenderfer 2000; Kochenderfer et al. 1997; Edwards et al. 2016; Warrington et al. 2017). Project actions following this approach are expected have insignificant impacts to candy darter populations and critical habitat.

Non Native Invasive and Undesirable Species Control - The Forest-wide NNIS EA recommends that only an aquatic formulation herbicide be used for treatment within stream channel buffers indicated in the Forest Plan or within 100 feet of other water bodies, otherwise, non-herbicide control methods may be used. Direct and indirect effects of herbicide use are expected to be inconsequential for aquatic and riparian resources if application of aquatic formulations of herbicide are applied following manufacturers direction.

Insecticide use may occur in the project area to address hemlock woolly adelgid (HWA) infestations. Chemical treatment of HWA would adhere to manufacturer's application direction, avoid use within riparian buffers, and be restricted to seasonal application. Crayton (2019) concluded that areas with adjacent HWA treatment using the pesticide imidacloprid had direct correlation to concentrations being found in benthic macroinvertebrates. Bioaccumulation of the substance has the potential to occur in species that comprise the higher trophic levels that consume macroinvertebrates. Treatments would not occur in streamside buffers, and headwater streams where these treatments would occur are not in candy darter habitat. Thus, effects of this treatment pose a low potential for risk.

Stream Crossings in System Road Maintenance - This project would alter two stream crossings – one being a temporary bridge on Hacking Run and the other a culvert replacement on Spencer Run. The Hacking Run crossing (0.5 miles from suitable habitat) is at a location where a temporary bridge has already been installed and removed previously. Existing bridge abutments occur at this site and a temporary bridge is expected to be placed on the abutments. There is no in channel work expected at this site.

The Spencer Run crossing (0.7 miles from suitable habitat) is a replacement with a larger structure that would involve more ground disturbance than temporary bridge placement, however the footprint would still be less than one-half acre (View Table 8). Project design practices include: time of year restrictions allowing for the replacement to take place only during the drier portion of the year (July-September), pumping around the active work site to operate in dry conditions, placing erosion control measures around perimeter of the work site, and mulching and seeding disturbed soils.

Both stream crossings are located one half mile or greater from suitable candy darter habitat in the North Fork Cherry River and culvert replacement would comply with stream simulation design methodology. Habitat within these two streams is associated with high gradient, large substrate, step pool type habitat, which is not suitable for candy darter. Sediment and Erosion control measures would be applied at stream crossings to reduce the potential for effects. Following conservation measures outlined below and National Core BMP guidance (Road-7) (U.S. Forest Service, 2012), these actions are not expected to affect suitable candy darter habitat. Road stream crossing structures that warrant replacement would be designed in accordance with stream simulation design methodology. The remaining stream crossings identified in Table 8 may be altered through identified road maintenance, however because these are located high in the watershed far from suitable candy darter habitat and would incorporate necessary BMPs for sediment control, effects of these possible replacements is expected to be insignificant to candy darter or critical habitat.

Potential adverse effects of stream crossing would primarily be limited to localized clearing of streamside vegetation as well as potential short-term effects on water quality after project construction. Applying West Virginia BMPs for erosion and sediment control and Forest Plan standards reduces the amount of soil loss and sediment delivery to the stream channels. When site conditions are not suitable for replacement (i.e. wet conditions, high water, etc.) then soil disturbing actions would not commence until stream and soil conditions are within a manageable condition. Clearing of streamside vegetation may be needed for safe construction operations and would be limited to only what is needed to remove. This removal is not expected to cause measurable increased water temperature within downstream suitable habitat because an opening currently exists and the small amount of canopy coverage loss is expected to be taken up with other trees within a growing season (Valverde and Silvertown, 1997).

Recognizing the priority to guard against potential risks to the genetic integrity of candy darter when contemplating stream crossing locations within the GHFR project area, long-term benefits associated with the restoration of aquatic habitat connectivity in the project area would be expected to outweigh potential short-term adverse effects of localized vegetation clearing and

sediment production associated with road maintenance activities and construction activities at the project site.

Prescribed Fire - Duration and temperature are relevant concerns of prescribed fire risk to the aquatic resources. Management of prescribed fires are designed to create low temperature, efficient burns that accomplish fuels management and terrestrial habitat objectives without sacrificing the integrity of the forest floor composition to capture and dissipate rain and snowfall. McNabb and Swanson (1990) concluded that generally, sediment production from fire-related activities is not a serious contributor when compared to other forest management practices, such as certain timber harvest methods and associated roads. The prescribed fire occurring in this project is expected to be a low intensity burn, with only lighter fuels being burned and not burning the entire organic layer down to mineral soil. This type of burn is not expected to increase sediment potential or affect water quality of candy darter habitat.

The prescribed burn area in the GHFR project totals 357 acres. This burn would incorporate MIST techniques to reduce the potential for impacts from fire line creation that may affect candy darter. This includes the use of hand blowers to clear fire line, or the use of existing features on the landscape, which limit the need for ground disturbance. When using MIST control tactics, burns slowly back down to riparian areas with wet soils, and mosaic burn pattern occurs, extinguishing within the riparian buffer. Since prescribed burns do not occur within 100 feet of critical habitat and project design includes the MIST technique, expected low burn intensity, and blow-lines or existing features for fire line creation, burning effects of prescribed fire pose a low risk to candy darter and proposed critical habitat. Woody material would be pulled to central locations away from riparian areas during fuel break and pile burning actions, which should have discountable effects to candy darter and designated critical habitat.

Constituent Elements:

The following five Physical and Biological Features (PBF) are considered essential to the conservation of the candy darter as listed in the final habitat ruling (Federal Register Vol. 86, No. 65; 04/07/2021). Each PBF is addressed as to how project actions are expected to interact with each of the five components:

- *Ratios or densities of nonnative species that allow for maintaining populations of candy darters.*

The North Fork Cherry has no known presence of nonnative variegate darter occurrence. This project is not expected to increase opportunity for introduction of nonnative species and culvert replacement is only occurring within high-gradient tributaries not suitable for candy darter occurrence.

- *A blend of unembedded gravel and cobble that allows for normal breeding, feeding, and sheltering behavior.*

The existing condition of critical habitat in the action area consists of fine silts and sands, gravel, cobble, and boulder substrate. Project actions have the potential to marginally increase downstream fine and course sediment delivery (Macdonald & Coe, 2007) above normal stream

particle distribution, which can increase the fine particle occurrence within candy darter critical habitat. Possible sediment delivery would be mitigated with BMPs associated with project actions to limit downstream effects. Measurable increased sediment occurrence in suitable habitat is not expected, thus increases in sediment are expected to be insignificant for habitat preference of candy darter.

- *Adequate water quality characterized by seasonally moderated temperatures and physical and chemical parameters (e.g., pH, dissolved oxygen levels, turbidity) that support normal behavior, growth, and viability of all life stages of the candy darter.*

A Forest water chemistry site within the project area, just upstream from the Gauley Ranger Station, has data records over the past 20 years. Over that timeframe pH values have remained between 6.7 – 7.7 and Acid neutralizing capacity has consistently measured above 50, meaning that it can buffer effects of acid deposition relatively well. These conditions are conducive to candy darter inhabitance and are expected to remain within the range of current conditions with inclusion of project activities.

- *An abundant, diverse benthic macroinvertebrate community (e.g., mayfly nymphs, midge larvae, caddisfly larvae) that allows for normal feeding behavior.*

Feeding behavior and prey abundance change is expected to be insignificant to normal candy darter feeding. Candy darter typically feed and inhabit riffle and run type habitats. These habitats generally are not where sediment is deposited and are not expected to receive measurable increases of sediment that would degrade habitat conditions of candy darter prey species. Imidacloprid use would avoid stream buffers that could have impacts to benthic macroinvertebrates.

- *Sufficient water quantity and velocities that support normal behavior, growth, and viability of all life stages of the candy darter.*

Noticeable change of water quantity and velocity within critical habitat of the North Fork Cherry River is not expected from this project. Actions within tributary streams of the North Fork Cherry River may experience slight alterations of water quantity, but would be expected at basal flows, possibly beneficial to maintaining sufficient water quantities through dry portions of the year.

Determination of Effects

This consideration of candy darter populations and designated critical habitat within the action area and the likelihood of effects from project elements associated with the proposed action determines this project **may affect, is not likely to adversely affect** candy darter or designated critical habitat.

Cumulative Effects

☒The Gauley Healthy Forest Restoration Project will have cumulative effects similar to the effects analyzed in the 2006 Forest Plan PBA and PBO and subsequent amendments.

Site specific ESA cumulative effects:

Action Area:

The action area consists of both private and USFS-owned lands. Currently, MNF-managed land within the action area is approximately 98% forested and 2% open areas. The majority of the forested MNF managed land, within the action area exists in mid to late successional stage, with trees 80-100 years old. The forest type is predominately mixed mesophytic. Open areas consist of maintained wildlife openings. Private land in the action area is open residential and small woodlots. There are no other known logging activities planned within the action area at this time. There are no grazing allotments within the action area on Federal land or private agricultural lands.

The action area contains 8.8 miles of North Fork Cherry River, 0.2 miles of South Fork Cherry. and 3.4 miles of Cranberry River totaling 12.2 miles of candy darter critical habitat. Various streams (Hunters Run, Coats Run, and North Fork Cherry) within the project area receive regular treatments of limestone from the West Virginia Division of Natural Resources (WVDNR) to help mitigate some symptoms associated with stream acidification. Limestone treatments would be continued for the foreseeable future to maintain existing aquatic populations at their current levels in these streams. Forest-wide cumulative effects are analyzed on pages 61-62 of the 2006 Programmatic Biological Opinion for the Monongahela National Forest 2006 Forest plan Revision.

Table 9 Estimated acreage of proposed management actives that may contribute to take of Indiana bats

Activity	Project Acres	Maximum Annual Acreage	Total Estimated Acreage During First Decade
Prescribed fire	373	3000-6000	10,000-30,000
Wildfire suppression	0		
Road construction and reconstruction (Temporary Roads)	4	78	630-780
Programmed regeneration harvest	350	4000	20,000-40,000
Programmed thinning	2,462	1300	7,000-13,000
Timber Harvest Total:		6900	33,000-69,000
Total acreage of all activities that may contribute to take:	**3,189**	10,052	44,370-100,520

Table 10 Conservation measures (Forest Plan/PBO Standards and Guidelines)

Management Direction for TEP Species		
Type	**Number**	**Direction Description**
Indiana Bat		
Standard	TE23	Retain all shagbark hickory trees 5 inches in diameter at breast height (DBH) or greater in harvest units except where public or worker safety concerns or research opportunities exist.

<table>
<tr><td>Standard</td><td>TE24</td><td>After post-harvest treatments, retain an average of at least 6 snags per acre that are 9 inches DBH or greater within harvest units, except where public or worker safety concerns exist. Create additional snags, if needed, from the available leave trees to make up any difference. Prioritize snag retention and creation from the largest to the smallest DBH.</td></tr>
<tr><td>Standard</td><td>TE25</td><td>Retain all known roost trees until such time as they no longer serve as roost trees (e.g. lose their exfoliating bark or cavities, fall, decay, or are no longer used by bats).</td></tr>
<tr><td>Standard</td><td>TE27</td><td>If a maternity site is discovered, establish a management zone centered on the site. The management zone shall not exceed a 2.5-mile radius unless site-specific factors or new scientific information indicate that a larger zone is needed. The zone may be smaller than a 2.5-mile radius if an evaluation of topography, known roost tree locations, proximity of permanent water, or other site-specific habitat characteristics indicates that a smaller zone is likely to satisfy the habitat needs of the colony. Needed protection measures within the zone shall be determined at a site-specific level in cooperation with USFWS and WVDNR.</td></tr>
<tr><td>Standard</td><td>TE28</td><td>If any new Indiana bat hibernacula are discovered on the Forest, the Forest shall develop appropriate protection measures in cooperation with USFWS and WVDNR. These measures could include closure orders, signs, fences, or gates.</td></tr>
<tr><td colspan="3">Northern Long-Eared Bat (NLEB)</td></tr>
<tr><td>4d rule (streamline) Consultation</td><td>Appx. A</td><td>All associated Conservation Measures associated with NLEB can be in Appendix A.</td></tr>
<tr><td colspan="3">Candy darter</td></tr>
<tr><td>Standard</td><td>SW34</td><td>No programmed timber harvest shall occur within the channel buffers identified in the table in SW37. Tree removal from the buffers may only take place if needed to meet aquatic or riparian resource management needs, or to;
a) Provide habitat improvements for aquatic or riparian species, or threatened, endangered, sensitive, and locally rare species;
b) Provide for public or worker safety;
c) Construct or renovate an approved facility;
d) Construct temporary road, skid road, or utility corridor crossings;
e) Conduct aquatic or riparian-related research, or
f) Allow for cable yarding.</td></tr>
<tr><td>Standard</td><td>SW35</td><td>Where new roads and skid roads cross stream channels, channel and bank stability shall be maintained.</td></tr>
<tr><td>Standard</td><td>SW37</td><td>During project-level planning and implementation, determine channel buffers for streams that would potentially be affected by proposed activities. The following table represents default buffer widths to be applied to both sides of the channel.
Table 11 Stream Buffer By Classification
<table>
<tr><th>Stream Classification</th><th>Buffer Width</th></tr>
<tr><td>Perennial</td><td>100 feet</td></tr>
<tr><td>Large Intermittent (>50-acre drainage area</td><td>100 feet</td></tr>
<tr><td>Small Intermittent (<50-acre drainage area)</td><td>50 feet</td></tr>
<tr><td>Ephemeral</td><td>25 feet</td></tr>
</table>
Buffer widths may be adjusted based on interdisciplinary review and site-specific field investigation. The buffers shall, at a minimum, encompass the riparian area defined on the basis of soils, vegetation and hydrology and the ecological functions and values associated with the riparian area.</td></tr>
</table>

Standard	SW40	Skid trails and landings shall not be constructed within 100 feet of perennial, intermittent, and ephemeral channels except at crossings or when location outside the 100-foot zone pose a greater risk to aquatic or riparian resources. The 100-foot filter strip may be modified based on site-specific conditions such as soil type, slope, and stability.
Goal	RF04	Maintain or restore late successional stands to a pre-fire suppression condition consistent with management prescription emphasis and desired conditions.
Goal	RF07	Prepare a Fire Management Action Plan to help implement Forest Plan Fire Management direction. Identify available resources and plan-specific prevention, detection, suppression, and prescribed burning actions based on the Fire Regime Condition Class and the following: a) An analysis of probable fire locations. b) Expected fire intensities c) Potential net resource value changes d) Risk to health and safety.
Standard	RF13	Wildland Fire Use may only occur under a fire management plan that evaluates a full range of management responses.
Added Measure	1	Apply West Virginia BMPs for erosion and sediment control, Forest Plan standards, and other requirements associated with project permitting under the Clean Water Act (sections 401 and 404).
Added Measure	2	Continue to monitor aquatic resource conditions in the project area in accordance with established survey methodologies, locations, and schedules associated with the Forest's on-going Aquatic Ecological Unit Inventory efforts.

Maps:

Figure 1: Fire & Ground-Based Logging Plan

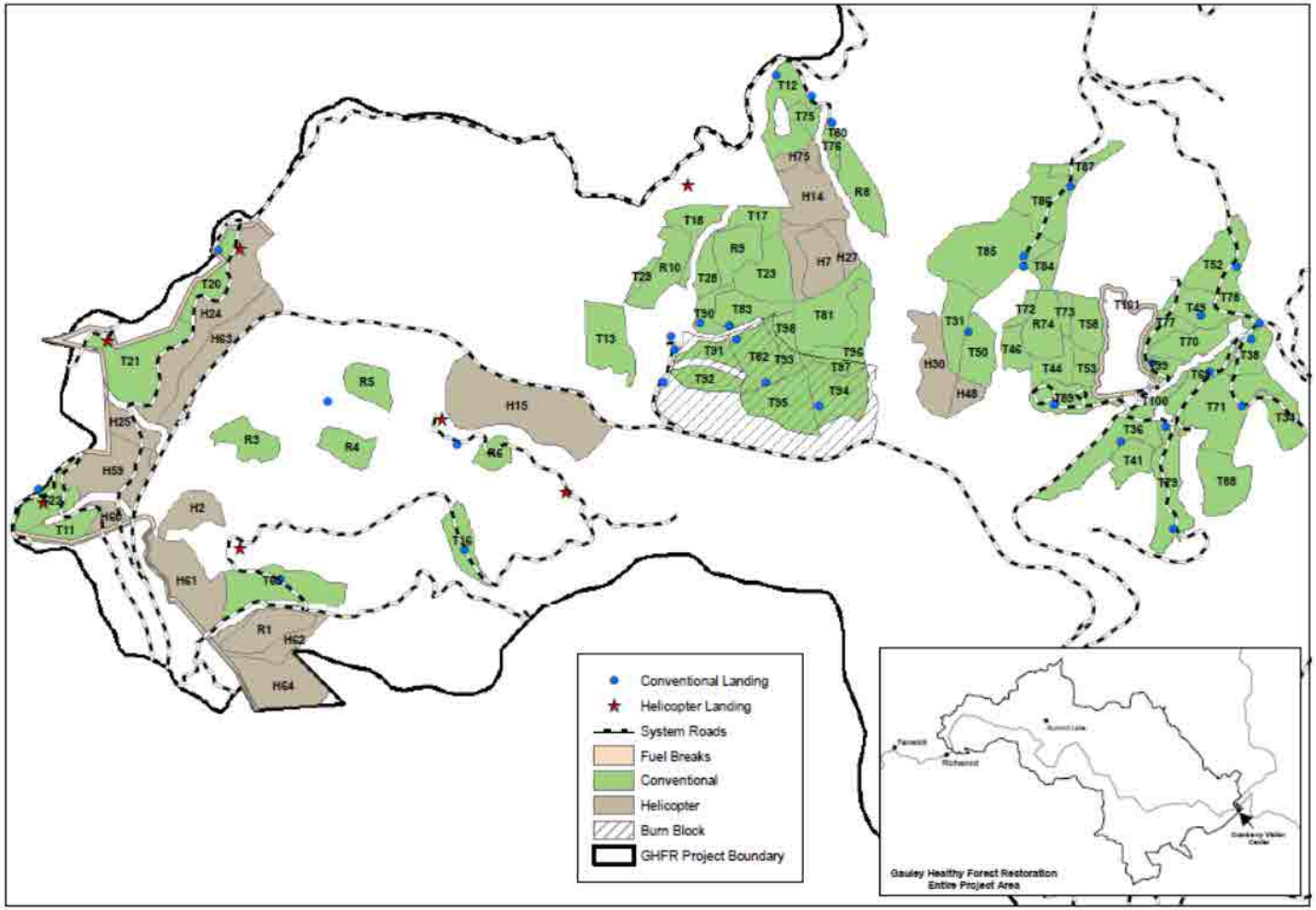


Figure 2 Helicopter & Ground-Based Logging

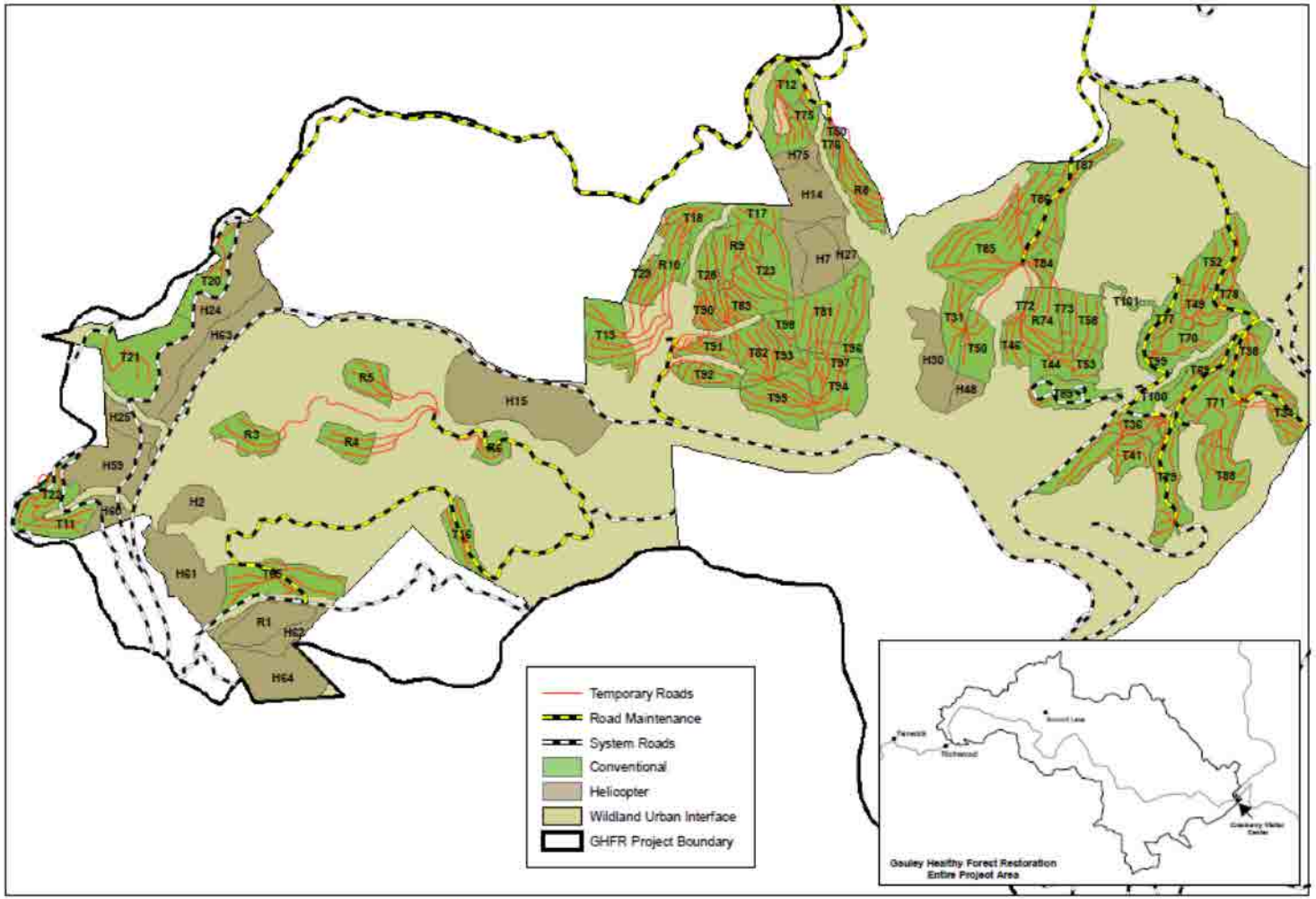
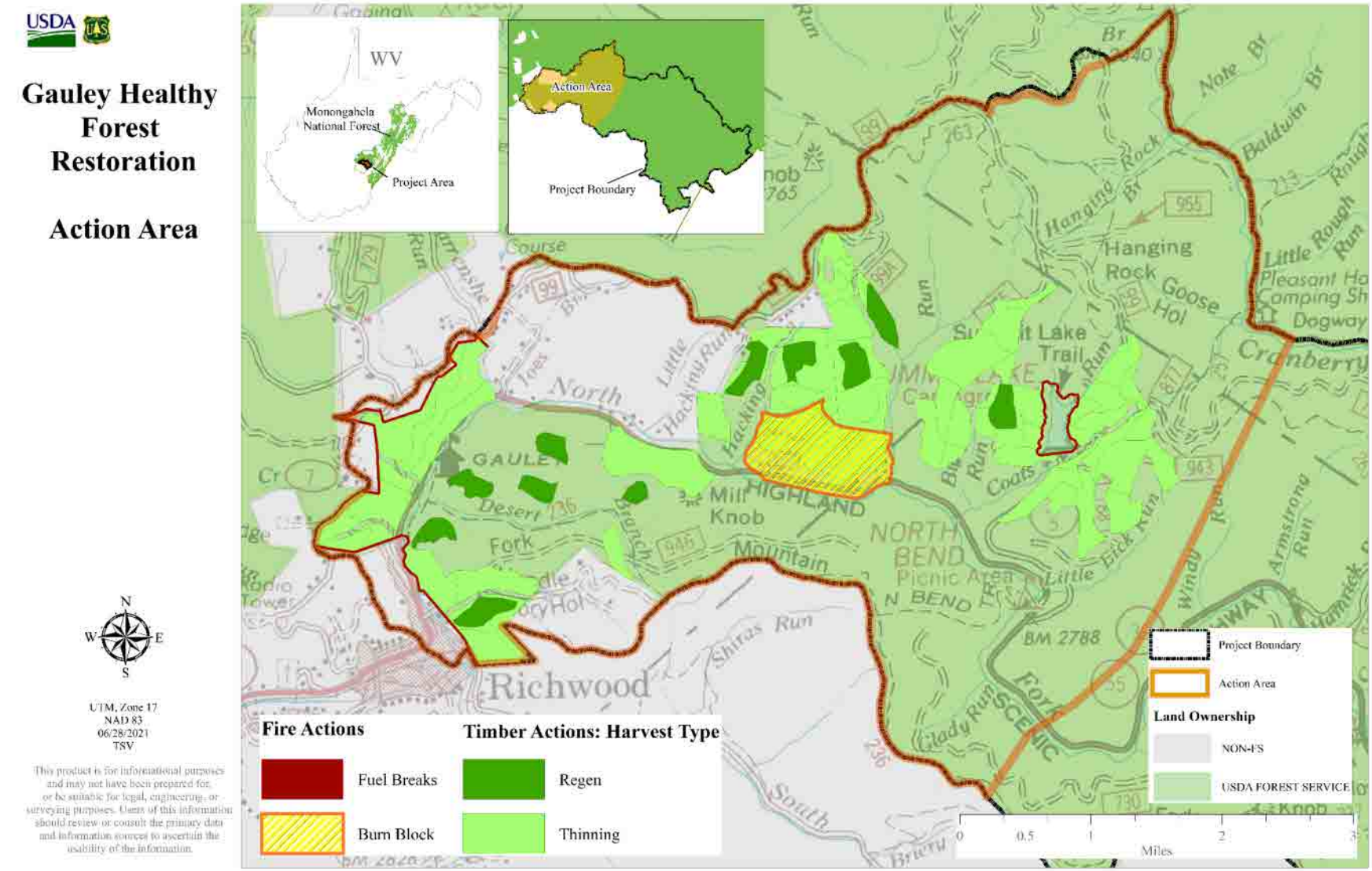


Figure 3 Action Area Map



Forest Service Signatures

BA Prepared by: Kim Tarter

Signature: _____

Email: Kim.Tarter@USDA.gov

Phone: (304) 846-2695

Date: 7/1/2021

Reviewed by FPM: Sarah Dezelin

Signature: _____

Email: Sarah.Dezelin@USDA.gov

Phone: (304) 846-2695

Date: 7/1/2021

U.S. Fish and Wildlife Service Signatures

☐The USFWS agrees with the determination of effects outlined in this Biological Assessment for the Gauley Healthy Forest Restoration Project. The effects are consistent with the 2005 Programmatic Biological Opinion and subsequent amendments.

☐The USFWS signatures below constitute our concurrence with the determinations of no effect or not likely to adversely affect the following species:

☐The USFWS signatures below constitute our Tiered Biological Opinion for the Indiana bat and running buffalo clover. The re-initiation clauses on the 2006 Programmatic Biological Opinion still apply.

> ☐The Indiana bat take table is accurate and up to date. No additional Reasonable and Prudent Measures (RPM's) or Terms and Conditions (TC's) are necessary.
>
> ☐ The USFWS is proposing these additional RPM's/TC's (include rationale for new RPM's/TC's):
>
> ☐The USFWS has reviewed the status of the species for all species in this consultation and has determined that it:
>
> ☐Has not changed.
> ☐Has changed. (Update here)

Biologist Reviewing BA: Click here to enter text. Phone:Click here to enter text.

Signature: _____ Date: Click here to enter a date.

For Formal Consultation, the Field Supervisor must review and sign.

Field Supervisor: Click here to enter text.

Signature: _____ Date: Click here to enter a date.

APPENDIX A – Page Number References for Tiered Documents and NLE Bat 4(d) Rule

From the Programmatic Biological Opinion (U.S. Fish and Wildlife Service 2006)

Indiana Bat	pages 27 to 68
Running Buffalo Clover	pages 13 to 27

From the Forest Management Plan (USDA Forest Service. 2006, Revised 2011)

TES	II-22 to II-28

From the Forest Plan EIS (USDA Forest Service. 2006.)

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form for the Gauley Healthy Forest Project

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if re-initiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees? List agencies and data sources consulted and the date reviewed: BatRoostDataDraft2003_2019_01312020, MNFMistnetTemp1997_2019_01302020, NLEBhib_WvDnrCaves_0605, MonongahelaNF_NLEB_known_hib_090715 (Reviewed 02/06/2020)	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.): See Part A

Project Name: See Part A

Project Location (include coordinates if known): See Part A

Basic Project Description: See Part A

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html

[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion (New Landings)	12.5 acres (Table 2)	
If known, estimated acres[5] of forest conversion from April 1 to October 31 (New Landings)	12.5 acres (Table 2)	
If known, estimated acres of forest conversion from June 1 to July 31[6]	unknown	
Does the project include timber harvest? (if yes, report acreage below)	☒	☐
Estimated total acres of timber harvest (Thinning, Regeneration, Fuel Breaks, New Landings outside disturbance areas)	2831 acres (Table 4)	
If known, estimated acres of timber harvest from April 1 to October 31 (Thinning minus helicopter, Regeneration minus helicopter, Fuel Breaks, New Landings outside disturbance areas)	1982 acres (Table 4)	
If known, estimated acres of timber harvest from June 1 to July 31	unknown	
Does the project include prescribed fire? (if yes, report acreage below)	☒	☐
Estimated total acres of prescribed fire	357 (Table 4)	
If known, estimated acres of prescribed fire from April 1 to October 31	No broadcast burning during this period	

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

If known, estimated acres of prescribed fire from June 1 to July 31	No broadcast burning during this period	
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)	N/A	

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Forest Service Biologist: _____

Signature: _____ Date Submitted: _____

USFWS Biologist Reviewing: _____

Signature: _____ Date Reviewed:_____

Section 7(a)1 Activities - Discretionary Conservation Recommendations:

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further its purposes by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to minimize or avoid the adverse effects of a proposed action, implement recovery plans, or develop information useful to the conservation of listed species. Below are a list of 7(a)1 conservation measures that will be included in this project:

Standard and Guidelines from the Land and Resources Management Plan:

- Retain all shagbark hickory trees 5 inches in diameter at breast height (DBH) or greater in harvest units except where public or worker safety concerns or research opportunities exist (See TE24).

Regional Conservation Measures Developed for the NLEB:

1. Designate caves and mines that are occupied by bats as smoke-sensitive targets. Avoid smoke entering these caves and mines any time of the year when Threatened, Endangered, or Sensitive (TES) bats are present.
2. Within 0.25 miles of known, occupied NLEB hibernacula, timber harvest will be designed to maintain, enhance, or restore swarming, staging, roosting, and foraging habitat. The future desired condition is that these areas will feature structurally complex, resilient forest communities with a continuous supply of snags, culls, cavities, and other quality roosts.
3. Application of herbicides and other pesticides will be planned to avoid or minimize direct and indirect effects to known, occupied TES bat hibernacula and maternity roosts.
4. Before old buildings, wells, cisterns, bridges, and other man-made structures are structurally modified or demolished, they will be surveyed for bats. If TES bat roosting is found, demolition or modification of these structures will not occur when bats are present and the need for alternative roosts will be evaluated.
5. Avoid cutting or destroying known, occupied NLEB maternity roost trees unless they are an immediate safety hazard.
6. Where needed to provide drinking sources for bats, create small wetlands or water holes.

Additional Project-Level Conservation Measures for the NLEB:

- No broadcast burning during the pup season (June 1 to July 31). Piles can still be burned.

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United States
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Monongahela
National
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Gauley
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District

Gauley Healthy Forest Restoration – Biological Evaluation

Threatened, Endangered, and Sensitive Plants

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Resource Impacts or Issues Addressed

This biological evaluation discloses expected direct and indirect effects of the Gauley Healthy Forest Restoration project on threatened and endangered plants, as well as Regional Forester's Sensitive Species plants. Regional Forester's Sensitive Species plants are hereafter referred to as sensitive plants; threatened, endangered, and sensitive plants are collectively referred to as TES plants.

The Proposed Action would involve various types of vegetation management activities that have the potential to affect TES plants (see the Categorical Exclusion (CE) Review for a detailed description of the Proposed Action).

Scope of the Analysis

For direct and indirect effects, the spatial boundary of the analysis is the Richwood Wildland Urban Interface (WUI) boundary (see Gauley Healthy Forest Restoration Project Helicopter & Ground Based Logging Plan map in CE Review). The Richwood WUI boundary includes all parcels of land that would be affected by project activities, therefore it is an appropriate boundary for the analysis of direct and indirect effects on TES plants. The Richwood WUI boundary encompasses approximately 7029 acres, which includes 7028 acres of National Forest land and one acre of private land.

The temporal boundary for direct and indirect effects on TES plants is 120 years from the beginning of project implementation. This is the time frame within which effects to forested habitat will persist. While effects to each individual species may not persist that long, successional changes set in motion by regeneration harvesting will continue for at least that long, potentially affecting some species that occur in forested habitats. T

Methodology

Surveys for TES plants were conducted in many of the proposed activity areas that would involve soil disturbance and/or removal of 20 percent or more of the overstory in mature stands. Field surveys covered representative habitats in areas proposed for commercial timber harvest, temporary road and landing construction, prescribed fire, and fuel break establishment. Areas proposed for road maintenance were generally not surveyed because these activities have little potential to affect TES plants (see discussions of direct and indirect effects below). Surveys for TES plants will be conducted in proposed activity areas that have not been previously surveyed, where optimal habitat conditions exist, prior to implementation.

Surveys were conducted by experienced botanists and consisted of meandering walks through the proposed activity areas. Surveys covered representative habitats in all parts of the activity areas, with the goal of traversing 100 linear feet per acre of activity area on average. Surveys were intended to locate substantial populations of TES plants that could be important for maintaining Forest-wide population viability. Locations of TES plants were noted and documented using global positioning system technology. As a precaution in case additional species are listed prior to project implementation, botanists generally listed all plant species that were encountered.

Field surveys were conducted from 2001-2006. All surveys were conducted between June 1 and September 30, inclusive, which constitutes the active growing season for TES plants that are known to occur on the Monongahela National Forest. Field surveys were supplemented by existing records of TES plants from files at the Monongahela National Forest Supervisor's Office and the West Virginia Division of Natural Resource's Natural Heritage program.

Discussions of the effects of proposed activities were based on reviews of scientific literature and other information, as well as the general observation and experience of the Ecologist. The likelihood of occurrence in the project area for each TES plant was assessed in the Likelihood of Occurrence document, which is filed in the project record. The likelihood of occurrence was based on field surveys, historic records, and the presence of potential habitat in the project area.

Affected Environment – Threatened and Endangered Plants

Four federally-listed threatened and endangered plant species are known to occur on the Monongahela National Forest: running buffalo clover (*Trifolium stoloniferum*), shale barren rockcress (*Arabis serotina*), Virginia spiraea (*Spiraea virginiana*), and small whorled pogonia (*Isotria medeoloides*). Based on field surveys and existing records, none of these species are known to occur in the analysis area. Following is a brief description of the typical habitat and likelihood of occurrence in the analysis area.

Virginia Spiraea - Virginia spiraea is a clonal shrub found on damp, rocky banks of large, high-gradient streams (USFWS 1992a). Within the analysis area, potential habitat for Virginia spiraea is limited to the channels and banks of larger streams such as the North Fork Cherry River and some of its larger tributaries.

Existing records show that the nearest known occurrence of Virginia spiraea is along the Greenbrier River approximately 25 air miles southeast of the analysis area. Virginia spiraea is not known to occur along any streams in the analysis area, so the likelihood of occurrence is considered to be low. However, streams were not included in the field surveys, so the potential for occurrence in the analysis area cannot be ruled out completely.

Running Buffalo Clover – Running buffalo clover is typically found in mesic habitats with partial to filtered sunlight and a prolonged pattern of moderate and periodic disturbance, such as grazing, mowing, trampling, selective logging, or flood-scouring. Running buffalo clover is often found in areas underlain with limestone or other calcareous bedrock, but not exclusively. In West Virginia, sites have also been identified on the Mauch Chunk formation, which is primarily shale (Harman 2016). Running buffalo clover is found in a variety of habitat types, including mesic woodlands, streambanks, grazed woodlots, mowed paths, old logging roads, trails, mowed wildlife openings within mature forests, savannahs, sandbars, steep ravines and infrequently used ATV trails and gravel drives (USFWS 2007, 2008a). Sites that were recently discovered occur in hawthorn thickets and locust savannah communities. The Monongahela National Forest is a stronghold for running buffalo clover, with the largest and highest quality populations range-wide occurring on the Forest (USFWS 2007).

Existing records show that the nearest known occurrence of running buffalo clover is located along a Forest Service road, approximately 9 air miles northeast of the analysis area. The likelihood of occurrence for running buffalo clover is considered low because it is not known to occur in the analysis area, and field surveys have not located it.

Small Whorled Pogonia – Small whorled pogonia habitat preferences are poorly known, but could include a variety of forested habitats. The available literature indicates occurrence in mixed deciduous and pine-hardwood habitats of a variety of ages, often near partial canopy openings (USFWS 1992b) or in open understories. Small whorled pogonia appears to be associated with acidic soils having a pan layer, and slopes of 11 to 17 percent near small streams (USFWS 2008b).

The likelihood of occurrence for small whorled pogonia is considered low because it is not known to occur in the analysis area, and field surveys have not located it. However, the potential occurrence cannot be completely ruled out based on habitat preferences and due to the difficulty of locating this species using conventional survey techniques.

Shale Barren Rockcress – Shale barren rockcress occurs in specialized habitats known as shale barrens in eastern West Virginia and western Virginia (USFWS 1991). Shale barrens are limited to the drier areas of the Monongahela National Forest. Therefore, shale barren rockcress is not likely to occur in the analysis area due to a lack of habitat.

Affected Environment – Regional Forester's Sensitive Species Plants

Seventy plant species are listed as Regional Forester's Sensitive Species on the Monongahela National Forest. Based on field surveys and existing records, one sensitive plant species is known to occur in the analysis area: longstalk holly (*Ilex collina*). Based on the Likelihood of Occurrence table, potential habitat exists for an additional 32 species, for a total of 33 sensitive species that could occur in the analysis area. However, for the 33 species with potential habitat but no known occurrences, field surveys did not locate them in the activity areas. Therefore, the probability of occurrence of these 33 species in areas that would be affected by project activities is low.

To facilitate analysis, sensitive plant species have been grouped according to their primary habitat. The three habitat groupings are mesic forests, wetland/riparian habitat, and rocky habitat. Mesic forest is a broad grouping that includes mixed hardwood and northern hardwood forests, as well as hemlock-hardwood mixed forests. Mesic forests cover the majority of the analysis area. Forests dominated by oaks are scattered throughout the analysis area, but they do not cover large areas and generally fall toward the mesic end of the oak forest moisture spectrum. Therefore, the oak forests are included with the mesic forests for this analysis. Riparian habitat and small areas of wetland habitat occur along streams throughout the analysis area. Small seep wetlands also occur on slopes in areas that are not near streams. Dry rocky habitat includes dry rock outcrops and ledges that occur at various elevations along ridge tops and side slopes, whereas moist rocky habitat includes the wet outcrops and moist colluvial rubble that occur along streams and in cove bottoms. The analysis area has the potential to contain

patches of both types of habitat. Some overlap among the habitat types occurs. For example, mesic forests, wetland/riparian habitat, and moist rocky habitat co-occur in the deep, narrow coves. The following table lists sensitive species that could occur in the analysis area.

Table 1. Sensitive species that could occur in the Gauley Healthy Forest Restoration analysis area.

Scientific Name	Common Name	Habitat Comments	Known Occurrence(s)	Potential Habitat
Mesic Forests				
Botrychium lanceolatum var. *angustisegmentum*	Lanceleaf Grapefern	Moist, shady woods and swamp margins		X
Carex lucorum var. austrolucorum	Blue Ridge Sedge	Well-drained, acidic soils on mesic to dry slopes		X
Carex roanensis	Roan Mountain Sedge	Mid- to high-elevation mesic forests		X
Corallorhiza bentleyi	Bentley's Coralroot	Habitat preferences poorly understood		X
Cypripedium reginae	Showy Lady's Slipper	Swamps and woods		X
Juglans cinerea	Butternut	Variety of wooded situations; does not require rich soil, but generally does not occur on the poorest sites		X
Platanthera shriveri	Shriver's Purple Fringed Orchid	Deciduous forests; wooded roadsides		X
Rosa blanda var. blanda	Smooth Rose	Thickets, grassy verges, edges of woods, ditches, stream banks, gravelly and sandy flats		X
Triphora trianthophora	Threebirds Orchid	Deep leaf litter or humus		X
Viola appalachiensis	Appalachian Violet	Often in riparian areas, but can occur in other mesic situations		X
Wetland and Riparian Habitat				
Amelanchier bartramiana	Oblongfruit Serviceberry	High elevations in wet and moist sites		X
Baptisia australis var. *australis*	Blue Wild Indigo	Primarily early successional wetlands		X
Hasteola suaveolens	False Indian Plantain	Riverbanks and disturbed wetlands		X
Hypericum mitchellianum	Blue Ridge St. John's Wort	Riverbanks and disturbed wetlands		X

Scientific Name	Common Name	Habitat Comments	Known Occurrence(s)	Potential Habitat
Ilex collina	Longstalk Holly	Open or closed canopy wetland/riparian	X	
Listera cordata	Heartleaf Twayblade	Mossy hummocks in forested wet areas; moist, mossy sites in conifer and conifer-hardwood forests		X
Marshallia grandiflora	Monongahela Barbara's Buttons	Banks of large streams		X
Potamogeton tennesseensis	Tennessee Pondweed	Slow-flowing rivers		X
Ranunculus pensylvanicus	Pennsylvania Buttercup	Wetlands in full sun and filtered sunlight		X
Ribes lacustre	Bristly Currant	Wetlands in partial shade or full sun		X
Vitis rupestris	Sand Grape	River banks		X
Woodwardia areolata	Netted Chainfern	Swamps and wet woods		X
Rocky Habitat				
Clematis occidentalis var. occidentalis	Western Blue Virginsbower	Rocky habitats in at least partial shade		X
Cornus rugosa	Roundleaf Dogwood	Rocky areas within forests		X
Gymnocarpium appalachianum	Appalachian Oak Fern	Rocky woods along streams		X
Heuchera alba	White Alumroot	Rocky areas within forests		X
Piptatherum canadense	Canadian Ricegrass	Sandstone barrens		X
Pycnanthemum beadlei	Beadle's Mountainmint	Open canopy over rocks		X
Saxifraga michauxii	Michaux's Saxifrage	Wet ledges, boulder fields, and rocky slopes, usually in thin soil over rock		X
Scutellaria saxatilis	Smooth Rock Skullcap	Variety of rocky situations, but most common in moist, partially shaded talus.		X
Taxus canadensis	Canada Yew	Moist, rocky habitats along streams; wetlands and spruce forests		X

Scientific Name	Common Name	Habitat Comments	Known Occurrence(s)	Potential Habitat
Tortula ammonsiana	Ammon's Tortula Moss	Wet, cool outcrops		X
Trichomanes boschianum	Bristle-fern	Dripping rocks		X

Effects – Threatened and Endangered Plants

Direct and Indirect Environmental Effects

Virginia spiraea– Proposed activities would not occur in or near potential habitat for Virginia spiraea. Therefore, these activities would not affect Virginia spiraea.

Running buffalo clover is not known to exist in any of the proposed activity areas. Therefore, direct effects on running buffalo clover are not likely to occur. If any undiscovered occurrences of running buffalo clover exist in proposed activity areas effects could occur. Potential habitat could be impacted but such effects on habitat would not translate into actual impacts on running buffalo clover unless undiscovered populations exist.

The open canopy created in regeneration units likely would lead to running buffalo clover being out-competed by sun-loving herbs, shrubs, and saplings. Beneficial effects could occur in thinning units due to the partial opening of the canopy. If any undiscovered occurrences of running buffalo clover exist within temporary road and landing sites, they could be damaged or eliminated. In conventionally-yarded thinning units, the soil disturbance due to skidding could benefit running buffalo clover by providing a suitable habitat for it to colonize. Temporary road construction and reconstruction could also create additional habitat.

The possible effects outlined are considered unlikely due to the low probability that any undiscovered occurrences of running buffalo clover exist. Therefore, the potential for adverse effects is considered discountable.

Small whorled pogonia is not known to exist in any of the proposed activity areas. Therefore, direct effects on small whorled pogonia are not likely to occur. If any undiscovered occurrence of small whorled pogonia exists in the proposed activity areas, effects could occur. Potential habitat could be impacted but such effects on habitat would not translate into actual impacts on small whorled pogonia unless undiscovered populations exist.

Commercial regeneration harvest, temporary road and landing construction, and prescribed fire have the potential to damage or eliminate small whorled pogonia. The effects of thinning harvest on small whorled pogonia are difficult to predict but may have a beneficial effect due to the partial opening of the canopy. Small whorled pogonia is not likely to be affected by road maintenance which would be limited to the existing footprint of heavily traveled roads that are not likely to support small whorled pogonia.

The possible effects outlined are considered unlikely due to the low probability that any undiscovered occurrences of small whorled pogonia exist. Therefore, the potential for adverse effects is considered discountable.

Shale barren rockcress – Habitat for shale barren rockcress does not occur in the analysis area. Therefore, none of the activities proposed would affect shale barren rockcress.

Cumulative Effects of Proposed Action

Under the Proposed Action, the potential for direct and indirect effects to threatened and endangered plants is so small it is considered discountable. Therefore, the Proposed Action would be unlikely to make any measurable contribution to the effects of other past, present, and reasonably foreseeable actions.

Effect Determinations for Threatened and Endangered Plants

Virginia spiraea - None of the proposed actions would have any potential to affect Virginia spiraea. Therefore, the proposed action would have **no effect** on Virginia spiraea.

Running buffalo clover - Under the Proposed Action, the potential for direct and indirect effects on running buffalo clover would be so low as to be discountable. Therefore, the Proposed Action **may affect but is not likely to adversely affect**, running buffalo clover.

Small whorled pogonia - Under the Proposed Action, the potential for direct and indirect effects on small whorled pogonia would be so low as to be discountable. Therefore, the Proposed Action **may affect but is not likely to adversely affect**, small whorled pogonia.

Shale barren rockcress - Shale barren rockcress has no potential to occur in the analysis area. Therefore, the Proposed Action would have **no effect** on shale barren rockcress.

Consistency with the Forest Plan

The Proposed Action would be unlikely to affect threatened and endangered plants adversely. Therefore, the Proposed Action would be consistent with Forest Plan direction to avoid and minimize adverse impacts to threatened and endangered plants.

Consistency with Laws, Regulations, Handbooks and Executive Orders

The Proposed Action would be unlikely to affect threatened and endangered plants adversely. Therefore, all alternatives would be consistent with Endangered Species Act protections and consultation requirements, as well as all regulations, directives, and policies that implement that act with respect to threatened and endangered plants.

Effects – Sensitive Plants

Direct and Indirect Environmental Effects

Activities that are unlikely to affect sensitive plants – Several activities that are proposed by the Proposed Action would have little or no potential to affect sensitive plants:

- **Site preparation and vine control using hand tools, crop tree release, and targeted herbicide applications.** Hardwood stands that would be commercially harvested also would be subject to various associated treatments. Cutting non-merchantable stems and vines would be accomplished using hand tools, so it would not involve any ground disturbance that might impact sensitive plants. If any butternuts are encountered, they would be protected by a project design feature. Tree planting, fencing or caging could be used to reduce deer browse but would involve no appreciable ground disturbance. Crop tree release would be conducted in young stands that are not likely to support sensitive plants due to intense competition from the low, dense saplings canopy. Applying herbicides using cut surface and basal spray methods would cause little or no overspray and would be unlikely to affect non-target plants, including sensitive species.

- **Nonnative invasive plant control** was analyzed in the Forest-wide Nonnative Invasive Plant Management Project Environment Assessment, which is filed in the project record.

Because the activities listed above have little or no potential to affect sensitive plant species, they will not be analyzed further in this report.

Activities that may affect sensitive plants – All other proposed activities involve ground and vegetation disturbance and could have at least a small chance of affecting sensitive plant species. These activities are analyzed according to their potential to affect sensitive plant species.

- **Commercial timber harvesting and associated temporary road and landing construction.** Proposed commercial timber harvesting includes regeneration of hardwood stands (351 acres), commercial thinning of hardwood stands (2464 acres), fuel break establishment (75 acres including 72 acres within commercial harvest units) and associated temporary road construction/reconstruction (62 miles) and landing construction (40 sites). These activities cover large portions of the analysis area, and while survey coverage of representative habitats will be obtained in the proposed units, the large total area proposed for harvest precludes 100 percent survey coverage within each unit. Therefore, some potential exists for undiscovered sensitive plants to be impacted.

- **Prescribed fire and fuels reduction**. Proposed prescribed fire includes broadcast burning of one unit (357 acres) and associated fire line construction, prescribed fire to maintain fuel breaks (75 acres), and pile burning within fuel breaks to reduce logging slash and woody debris created from commercial timber harvest. Survey coverage of representative habitats was obtained in the proposed units but the large total area proposed precluded 100 percent survey coverage. Therefore, some potential exists for undiscovered sensitive plants to be impacted.

- **Maintenance of existing roads.** In general, the roads that are proposed for maintenance (19 miles) are heavily used, maintained, and compacted. Many of the roads were used as travel

routes by botanists during their surveys of the other activity areas. However, despite the low probability of sensitive plants occurring on these routes, the possibility cannot be completely discounted, and survey coverage is not complete. While the probability is considered low, some potential exists for undiscovered sensitive plants to be impacted.

Longstalk holly is a deciduous shrub or tree with stalked red berries found at higher elevations in moist soil, especially riparian areas of high energy streams, but also present, though less common, in wet meadows, bogs, and seeps (NatureServe 2019). Longstalk holly is known to occur at 8 locations in the analysis area. The known occurrences are not within proposed activity areas and therefore would be directly affected by proposed activities. However, because longstalk holly is known to occur in scattered locations across the analysis area, additional undiscovered occurrences probably exist. Whether any undiscovered occurrences exist within proposed activity areas is not known.

Forest Plan direction that protects stream channels and wetlands would limit the potential effects of commercial harvest and associated activities on longstalk holly. Forest Plan direction prohibits programmed timber harvest in channel buffers (SW34) and limits roads, skid trails and landing to essential crossings (SW44, SW40). Similar protection is required for wetlands (SW51). Because of the allowance for essential crossings of streams and wetlands, temporary roads, skid trails, and landings would have some potential to impact longstalk holly. Impacts on undiscovered occurrences could include directly damaging or eliminating plants through grading, applying gravel, and installing culverts.

Prescribed fire is unlikely to carry through wetland/riparian habitat with much intensity. Recent experience on other prescribed fire projects on the Forest suggests that fire in mesic oak-hickory ecosystems will burn into the riparian area, but typically at low intensity. Such low intensity fire usually consumes the undecomposed leaf litter without substantial effects on the organic and mineral horizons of the soil. The effects of fire on longstalk are not known. Presumably, longstalk holly would be top-killed unless a lack of fuel limits the intensity of the fire. The extent to which roots and seeds would be damaged and plants potentially subjected to total mortality is not known, but likely would be related to fire intensity.

Other sensitive species - An additional 32 sensitive species have the potential to occur in the analysis area (Table 1). No occurrences of these sensitive species are known in the analysis area, so the potential for effects on these species is low. However, due to the representative nature of the surveys, the potential for impacts to undiscovered occurrences cannot be ruled out completely.

Mesic forest species –If any undiscovered occurrences of these species exist in areas proposed for commercial regeneration harvesting or temporary road and landing construction, they likely would be damaged or eliminated. One possible exception would be butternut, which is shade-intolerant and requires an open canopy to regenerate (Burns and Honkala 1990). If any undiscovered butternut seedlings or saplings survive the harvest, or if any seedlings become established following site preparation, they would benefit from the open canopy in even-aged regeneration units. For most species in this group, the effects of thinning harvests would be

uncertain because preferred light levels are not precisely known. However, any undiscovered butternuts likely would benefit from thinning.

The effects of prescribed fire on species in this group are unknown. Presumably, butternut would be top-killed or damaged by fire. The extent to which roots and seeds would be damaged and plants potentially subjected to total morality is not known, but would likely be related to fire intensity.

Wetland and riparian habitat species – Forest Plan direction that protects stream channel corridors and wetlands would limit the potential effects of commercial timber harvest and associated activities on wetland/riparian habitat sensitive plants (see longstalk holly direct and indirect effects discussion above). In contrast to the potential for negative impacts from road and skid trail crossings, habitat adjacent to the crossings could be improved for species that prefer an open or partially open canopy. Actual benefits to these species would not occur if no individuals are present nearby to colonize the habitat.

Prescribed fire is unlikely to carry through these habitats with much intensity, although the potential for effects cannot be ruled out completely (see longstalk holly direct and indirect effects discussion above).

Rocky habitat species – If any undiscovered occurrences of these species exist in areas proposed for commercial regeneration harvesting or temporary road and landing construction, they likely would be damaged or eliminated. Construction of temporary roads and landings typically avoids major outcrops due to excavation difficulties, but smaller outcrops could be damaged. In addition, project activities are designed to avoid rocky habitats along streams and seeps.

The effects of prescribed fire on species in this group are unknown. Presumably, the woody species and semi-evergreen species (purple clematis and white alumroot) would be top-killed unless a lack of fuel in rocky areas limits the intensity of the fire. The extent to which roots and seeds would be damaged and plants potentially subjected to total mortality is not known, but likely would be related to fire intensity.

Effect Determinations for Sensitive Plant Species

The Proposed Action could affect any undiscovered occurrences of longstalk holly. However, as discussed above, such losses would not be expected to impact population viability within the analysis area or on a Forest-wide basis. Also, the Proposed Action would pose a very small risk of damaging or extirpating undiscovered occurrences of other sensitive plant species with potential habitat in the analysis area. Therefore, for all sensitive plant species listed in Table 1 above, the Proposed Action **may impact individuals but are not likely to lead to loss of viability or a trend toward federal listing.**

Sensitive plant species that are not listed in Tables 1 above are not expected to occur in the analysis area. Therefore, for all sensitive plant species not list in Tables 1, the action alternatives would have **no impacts.**

Consistency with the Forest Plan

The Proposed Action could affect undiscovered occurrences of sensitive plants, particularly longstalk holly. However, damage to known occurrences would be avoided or minimized through design criteria, so the Proposed Action would be consistent with Forest Plan direction to avoid and minimize negative impacts on sensitive plants to the extent practical (see Forest Plan standard VE13, p. II-19).

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GAULEY HEALTHY FOREST RESTORATION CE

FIRE AND FUELS EFECTS

/S/ John Fry 02/24/2020

Assistant Fire Management Officer

For most of the 20th century, any form of wildland fire, was quickly suppressed for fear of uncontrollable and destructive wildfires. In the 1960's, policies governing wildfire suppression changed due to ecological studies that recognized fire as a natural process. Today, polices advocating complete fire suppression have been replaced by policy that allows fire to act as a tool to meet resource objectives. Fire played an important role in the development and maintenance of oak forest in the eastern United States (Van Lear, Brose, and Keyser 2000). Declines of oak forests have been noted throughout much of the East and are often attributed to reduced frequency. Prescribed fire can be an important tool for regenerating oak stands by reducing competition and oak sprout vigorously after fire.

The identified proposed prescribed and fuels treatments are in conjunction with the Monongahela National Forest Plan. The Forest-wide desired condition is to use fire as a tool to achieve and maintain desired vegetative conditions and fuel levels. The Forest-wide goals and objectives of implementing fuels reduction and fuels break projects are to be located in areas that would reduce the wildfire risk to communities, municipal water supplies, and at risk federal land and prescribed fire would be used to mimic natural process to accomplish resource objectives.

Proposed Action

The proposed fire and fuels treatments include the creation and maintenance of fuel breaks adjacent to private property, municipal water sheds, and recreation sites. Biomass would be removed or treated, thus allowing fuel loading and fire hazards to decrease. Prescribed fire would be reintroduced into fire-adapted ecosystems thus fulfilling the Forest Plan objectives and goals.

The purposed treatments would move the project area towards a more resilient landscape and reducing overall surface fuel loading in the stands being treated. Crown-to-crown contact would be eliminate where thinning activities occur. Without crown-to-crown contact the potential for crown fire development and the subsequent destruction of the trees on site would be greatly reduced. Overall, the probability of intense surface fires in mixed hardwood stands would be reduced.

Prescribed Burning:

Periodic prescribed burning would reduce hazardous fuel conditions and the reintroduce fire into fire-adapted ecosystems thus fulfilling the Forest Plan.

The direct effects of implementing using prescribed fire would be a decrease in fuel loading. The proposed action would have a positive effect on restoring the natural fire regime by maintaining

disturbances in ecosystems that have adapted over time to periodic short-return interval disturbances. Studies show that areas that have prescribed fire introduced prior to a wildfire exhibit lower rates of spread, less intensity, less severity, and a smaller final wildfire size. When combined with past, present and future activities this project would provide short term and long term positive contributions within the analysis boundary by reducing fuels and reintroducing fire into the ecosystem.

The effects would be a gradual decrease in fuel loadings. After a couple of burns, the effectiveness of prescribed burning would start to decline, at which time maintenance burns would be implemented every 5-10 years. Periodic prescribed burning would reduce hazardous fuel conditions and the reintroduction of fire into the fire adapted ecosystems thus fulfilling Forest Plan objectives and goals. There would also be a reduction in the probability of damage to private and public improvements should a wildfire occur, a reduction of fuel loading to provide for public and firefighter safety, and protection of public and private property adjacent to the burn units in the event of a wildfire. There would be a very low risk of any effects to private property during or following prescribed burn implementation.

Prescribed fire would generate primarily short term smoke emissions. Smoke would disperse quickly and have no effect on air quality parameters. The majority of emissions from smoke produced by prescribed fires should typically occur within the first 8 to 24 hours of the prescribed burn being initiated. Residual smoldering, with small amounts of smoke production would continue for several days afterward in 100 and 1000 hour fuels sizes, but should disperse quickly. It is expected that smoke from the prescribed burns could impact roads and commercial and residential areas downwind, causing reduced visibility and very short term local air quality reduction. Signage maybe be used to warn motorists to slow down along sections of roadways if visibility is greatly reduced.

This activity would have no long-term negative effects on visitor safety and should increase public safety due to the decreased chance of wildfire from the controlled reduction of fuels. The proposed action would have a positive effect on restoring the natural fire regime by maintaining disturbances in ecosystems that have adapted over time to periodic short-return interval disturbances. Studies show that areas that have prescribed fire introduced prior to a wildfire exhibit lower rates of spread, less intensity, less severity, and a smaller final wildfire size. When combined with past, present and future activities this project would provide short term and long term positive contributions with the analysis boundary by reducing fuels and reintroducing fire into the ecosystem.

Mechanical Treatment:

Fuel breaks would be created by removing both understory and over story trees. Trees would be removed to allow for open canopy (no tree to tree contact). Hardwood species would be selected to remain because of their fire resistant properties. Tree density will vary with more open conditions closest to private property to encourage grasses and fade into a heavier density as distance from private property increase. The desired condition is a more natural appearance of

forest transitioning to open conditions near private property. Any residual fuels left after treatment implementation will wither be burned (piles or broadcast burn) or mechanically treated (chipped). Subsequent maintenance at three to seven year intervals by mechanical treatments or by prescribed burning to remove encroaching vegetation and ladder fuels would be done to maintain their effectiveness.

The direct effects of would be a decrease in fuel loading. The effectiveness of the activities would decease as biomass increased. The indirect effects would result in fuel loadings slowly increasing within the project area without maintenance treatments. The treatments would decline in effectiveness over time, with mechanical treatment declining over a ten-year period. The three-to-ten year maintenance schedule of the fuel breaks provide a constant benefit to the analysis area by maintaining lighter fuel loadings and thus low fire intensity.

The desired condition from a Fire and Fuels perspective is the protection of life and property, the reduction of hazardous fuels accumulations and the restoration of a fire adapted and resilient ecosystem. The project's proposed vegetation management activities and use of prescribed fire are needed to help restore the project area's natural fire regime, reduce the intensity of a wildfire and subsequent damage to the public and/or private property.

References

Van Lear D.H, Bros, Patrick and Keyser P.D. 2000 "Using Prescribed Fire to Regenerate oaks" Workshop Fire, People and the Central Hardwood Landscape, p. 97 – 102.

Effects to Heritage Resources

The proposed action has been analyzed for expected direct, indirect, and cumulative effects to historic property. For the purpose of this analysis, effect means the alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility for, the National Register of Historic Places (NRHP) per the definition in 36 CFR 800.16(i). Historic property means any prehistoric or historic district, site, building, structure, object or historical/cultural landscape included in, or eligible for inclusion in, the NRHP. The term historic property also applies to any cultural resource or property not yet evaluated to determine whether it is eligible for the NRHP. The term includes artifacts, features, records, and remains that are related to and located within such properties. The term also includes properties of traditional religious and cultural importance to an Indian tribe or native Hawaiian organization and that meet the National Register criteria per the definition in 36 CFR 800.16(l).The area of potential effect (APE) for the analysis of direct effects is defined spatially as the project area boundary. All management activities proposed by the project are confined within the project area boundary. The spatial boundary for the analysis of indirect effects extends beyond the project area boundary by 0.25 miles to consider potential visual effects to adjacent historic properties. The temporal limit used to evaluate direct, indirect and cumulative effects was ten years because the proposed actions will be completed within five years and the visual effects are likely to continue for up to five years post-treatment.

Field Survey and Consultation

The Forest Service will award a task order through contract to survey the APE. The survey will be a focused approach to identify historic properties at locations where previous surveys either had not been conducted, or where previous surveys were inadequate for the current analysis. The survey will be conducted in consultation with the West Virginia Division of Culture and History (WVDCH), the Absentee Shawnee Tribe of Oklahoma, the Eastern Shawnee, the Shawnee Tribe, the Delaware Nation, and the Seneca Nation. The resulting technical report will be reviewed by all consulting partners prior to implementation of ground disturbing activities. Protection measures, including avoidance, will be established for all historic properties identified to avoid adverse effects.

Direct and Indirect Effects to Historic Properties

The proposed action will have no adverse effect to historic properties. Protection measures established during consultation will eliminate or minimize direct and indirect effects to historic property. All historic properties identified would be marked and avoided during all phases of project implementation. Ground disturbing activities shall be prohibited within marked boundaries of historic properties.

- **Thinning and Associated Treatments, including vine control** have the potential to effect historic properties. Protection measures, including avoidance where necessary, would be necessary to eliminate or minimize adverse effects.
- **Clearcutting (Regeneration) and Associated Treatments have** the potential to effect historic properties. Protection measures, including avoidance where necessary, will be necessary to eliminate or minimize adverse effects.

- **Herbicide** – Herbicide use has limited-to-no potential to adversely affect historic properties.

- **Prescribed fire** activities have no adverse effect to historic property when natural or existing fire barriers, such as streams, ridges, roads and trails are used for fire control lines. Fire control barriers requiring ground disturbance will not occur where historic properties have been identified. Non-

ground disturbing methods, such as hand line, wet line or black line would have no adverse effect to historic property.

- **Road Maintenance** activities have no adverse effect to historic property where work is confined to previously maintained surfaces, ditches, culverts, and cut and fill slopes where there are no known historic properties because proposed work is clearly within disturbed context. None of the culverts to be replaced are historic property.

- **Temporary Roads** have the potential to effect historic properties. Protection measures, including avoidance where necessary, would be necessary to eliminate or minimize adverse effects.

- **Non-Native Invasive Species Treatments** such as hand-pulling, mowing, grubbing, biological control, and herbicide application have limited-to-no potential to adversely affect historic properties.

Cumulative Effects to Historic Property from Proposed Project Activities:

The potential for direct and indirect effects to historic property is negligible. As such, Alternative 2 would have no cumulative effect to historic property.

Consistency with the Forest Plan

Forest Goal HR01 provides for the identification and management of cultural resources on the Forest, as does direction in Heritage Resources Standards HR04, HR05.

Consistency with Laws, Regulations, Handbooks and Executive Orders

Executive Order 11593, promulgated in 1971, instructs that all archaeological resources on Federal land are to be evaluated, while the 1988 amendment to the Archaeological Resources Protection Act (16 USC 470 mm) instructs federal land-managing agencies to develop and implement a plan for archaeological survey and evaluation. Provided that National Register eligible sites are avoided or mitigated, and unevaluated sites are avoided or evaluated and appropriate management taken, then any of the Alternatives is consistent with the Forest Plan and legal statute.

Relevant Laws, Regulations and Authorities

Antiquities Act of 1906 (16 USC 431-433)
Historic Sites Act of 1935 (16 USC 461-467)
National Historic Preservation Act of 1966 (16 USC 470)
National Environmental Policy Act (42 USC 4321-4347)
Archaeological Resources Protection Act of 1979 (16 USC 470)
Archaeological and Historic Conservation Act of 1974 (16 USC 469)
Executive Order 11593
FSM 2361

Gauley Healthy Forest Restoration Project

Monongahela National Forest,

Gauley Ranger District

Categorical Exclusion Report for Hydrology

Timothy Tolley, Hydrologist

February 6, 2020

Existing Conditions

The project area contains portions of six 6th level (HUC-12) sub-watersheds although project activities will occur in only the western portion of the 23,756-acre North Fork Cherry River sub-watershed. The proposed project activities are mostly contained within nine catchments ("watersheds") of streams that are tributaries to the North Fork Cherry River. The remaining project activities occur in areas that drain directly to the North Fork Cherry River and not via one of its tributary streams.

The project area contains an estimated (from GIS LiDAR) 472 miles of non-system (i.e. legacy)features, of which approximately 32 miles will be reconstructed for use by this project. These are of various ages and have undergone varying degrees of recovery in the years or decades since their original use. They have mostly become covered with duff and other organic material over this time and thus erosion and sedimentation are generally minimal to nonexistent.

Effects:

Impacts Associated with Timber Harvesting.

The largest source of sediment in forested systems is from skid roads, haul roads, and landings associated with forest harvesting. In particular, the effects are generally associated with landings and the road system rather than on areas disturbed by tree cutting and dispersed skidding (Ketcheson et al. 1999 and Swift 1988). Roads and landings associated with timber harvesting produce effects that generally fall into the following three categories: 1) sedimentation and erosion, 2) altered natural hydrologic flow regimes of hillslopes, and 3) diminished resource productivity.

The GHFR project proposes no new permanent system roads so the impacts from roads will be limited to those from temporary roads. The temporary roads and their respective impacts are grouped into those that are created on existing features on the landscape (i.e. reconstructed on existing "legacy" features), and those created on previously undisturbed ground (i.e. temporary roads).

The GHFR project proposes creating a total of 61.9 miles of temporary roads, 32.3 miles of which will be created on existing features and 29.6 miles created on undisturbed ground. Most temporary roads (54.5 miles) will be created within the 1,961 acres of conventional harvest units. Of these conventional harvest units, 27.6 miles will be created on undisturbed ground and 26.9 miles on existing features. The remaining 7.4 miles are outside of any harvest units.

The creation of temporary roads, especially on hillslopes, generally consists of using a bulldozer to excavate a road prism into the hillside, thus creating a cut-slope on the uphill side of the roadbed, and a fill-slope on the downhill side.

Temporary roads constructed or reconstructed for this project be decommissioned within 3 years of project completion. Guidance on road decommissioning is provided by the MNF Land and Resource Management Plan (i.e. Forest Plan), National Core Best Management Practices (BMP) Technical Guide FS-990a, and FSM 7734. The Forest Plan (RF15, p. II-55) and the National

Core BMP Technical Guide (Road-5, Temporary Roads, p. 114) state that temporary roads are to be decommissioned/rehabilitated and the area returned to resource productivity after the access is no longer needed. FSM 7734.02 states the objective of road decommissioning is to "Stabilize, restore, and revegetate unneeded roads to a more natural state to protect and enhance NFS lands". It is expected that erosion and sedimentation impacts can be addressed with the successful application of these decommissioning steps. The greatest potential for erosion and sedimentation occurs the first-year post-harvest and generally decreases each year after that. The application of appropriate BMPs have been shown to be 53 to 94 percent effective at reducing sediment in the first year after harvesting (Edwards and Williard 2009). Altered hydrology and diminished productivity that result from the altered morphology of the hill slope during the construction of temporary roads on previously undisturbed ground are anticipated to remain as long-term impacts to the hydrologic resources. The impacts of altered hydrology and diminished site productivity are not specifically addressed by water bars and revegetation alone (Kolka and Smidt 2004).

The project proposes 17 new landings and 23 existing landings as indicated below.

- New, helicopter (4), approximately 8 acres
- New, conventional (13), approximately 6.5 acres
- Existing, helicopter (3), approximately 6 acres
- Existing, conventional (20), approximately 10 acres

As with road construction/reconstruction, landings pose a risk of erosion and sedimentation due to the bare ground that results from their creation and use. The BMPs applied to landings are expected to adequately address erosion and sedimentation risks. Landings incorporate drainage along the upslope perimeter to prevent water from flowing on to the landing, thus the only water on a landing is what has fallen directly onto it from precipitation. Additionally, landings do not present a linear, connected flow path for water, they are generally seeded, and generally include logging slash at the toe of the landing slope to help arrest sediment movement. Landings are not located closer than 100 feet from a perennial, intermittent, or ephemeral stream (Forest Plan Standard SW40, p. II-13).

Impacts Associated with Prescribed Fire and Fuels Reduction Treatments.

The prescribed low to moderate burn is expected to produce a mosaic of burn areas on the forest floor. This mosaic burn pattern will produce some parts of the forest floor that have burned at a greater intensity than others but overall it is expected to retain a ground cover of duff and organic matter sufficient to protect the underlying soil from erosion. The mosaic pattern will not be expected to produce the long, linear flow paths that are conducive to concentrated flow and erosion.

Suppression activities have a greater potential to create the extended linear flow paths, primarily in the form of dozer lines and hand lines. Dozer lines are not proposed for this project. To address this potential, the Forest proposes using natural features such as streams or rivers whenever possible, and to use the Minimum Impact Suppression Tactics (MIST) when the natural features are not available. Features created to control the prescribed burn will be

rehabilitated after use. By implementing the prescribed burn in the manner described in the Proposed Action, the impacts to hydrologic resources resulting from prescribed burn are expected to be minimal and of short duration.

Impacts Associated with System Road Maintenance

Maintenance of roads has been shown to reduce erosion and sedimentation input that these roads pose to water bodies of the watershed in which the roads are located. While they may produce some minor short-term erosion and sedimentation effects during and immediately after maintenance, an overall reduction in erosion and sedimentation is anticipated.

References

Edwards, P.J., and KWJ Williard. 2010. Efficiencies of forestry best management practices for reducing sediment and nutrient losses in the eastern US. Journal of Forestry.

Ketcheson, G. L., W. F. Megahan, and J. G. King. 1999. R1-R4 and BOISED Sediment Prediction Model Test using Forest Roads in Granitics. Journal of the American Water Resources Association, 35(1): 83-98.

Kolka, R. K. and M. F. Smidt 2004. Effects of forest road amelioration techniques on soil bulk density, surface runoff, sediment transport, soil moisture, and seedling growth. Forest Ecology and Management, 202: 313-323

Swift Jr., J. W. 1988. Forest access roads: design, maintenance, and soil loss. In: Swank, W. T., Crossley, Jr., D. A. (eds.). Forest Hydrology and Ecology at Coweeta, Springer-Verlag. New York, 313-324

Description of Integrated Pest Management within the GHFR project

Integrated Pest Management methods would be used to minimize or prevent the development of pest problems, and could include the use of pesticides, for example, to preserve hemlock trees facing mortality from hemlock wooly adelgid. (VE26,27, 28, 29, 32,34,35,36,37)

The CE category used for the GHFR project (HFRA (16 U.S.C.6591b) (FSH 1909.15, 32.3(3)): Insect and Disease Infestation) is applicable for this project because all project activities comply with the Healthy Forest Restoration Act section 603 requirements. Under this category, herbicides, insecticides, and pheromones may be used, but their use must be consistent with the Forest Plan.

Harvest treatments themselves are one component of the integrated pest management approach to be used in the project area. Diseased and infested trees will be removed in thinnings, leaving the most healthy trees available to form a fully stocked stand. In addition, regeneration harvests (commercial timber harvest that removes most or all of the trees in an area, with the intention of developing a new stand of young trees.) will remove most of the mature trees to develop a forest composed of smaller and younger trees that are more resilient when impacted by forest insects and disease organisms. Developing and maintaining tree species diversity in thinned and regenerated areas is another component of the project that can help to provide increased resilience to forest insects and diseases.

Use of insecticides that are registered and labeled for use on forest trees and shrubs, employing the methods and restrictions for such use, could potentially help maintain high value individual trees and species on the landscape. Labeling of such insecticides includes required measures to protect ground and surface waters, pollinating insect species and other flora and fauna. Most of these insecticides would be used on individual trees using hand labor.

It is anticipated that use within the project area would be unlikely to be needed on more than 20 acres overall, with less than 20 stems per acre being treated in most cases.

Gauley Healthy Forest Restoration

Recreation/Scenery Analysis

Existing Condition

Recreation

Camping, hunting, fishing, and driving for pleasure are the primary recreation activities within this analysis area. The North Fork of the Cherry River is stocked several times a year with hatchery trout. Summit Lake Campground, dispersed campsites, and trails are located within the area. Summit Lake visitors are consistent users (hunting, fishing, hiking, and biking) of the Gauley Healthy Forest Restoration project area. A dispersed camping area is located near the Fisherman's Trailhead and Forest Road 99 is used by equestrian users.

7.6-miles of multi-use trail (hiking, biking, equestrian, and cross-country skiing) are located within the analysis area.

A 5.9 mile portion of the Highland Scenic Byway, a designated National Scenic Byway and State of West Virginia Byway, is located within the analysis area.

Scenery

The landscape within the view shed of the analysis area provide outstanding scenic variety. The area consists of mountains separated by valleys ranging from narrow to wide. The steep hillsides are covered with an even textured hardwood forest. Openings along routes provide valuable visual interest. The Summit Lake and North Fork of the Cherry River arescenic attributes in the project area. Visually sensitive positions are on the State Route 39/55 portion of the Highland Scenic Highway (HSH), along the North Fork of the Cherry River and in Summit Lake Campground.

Wild and Scenic Rivers

The Wild and Scenic River Study completed by the Monongahela National Forest in 1995 identified a 10.8 mile segment of the North Fork of the Cherry River as eligible wild and scenic rivers, recreational river segment. Management is proposed adjacent to 5.9 miles of the river.

Wilderness

There are no federally designated wildernesses within the Gauley Healthy Forest Restoration Analysis Area.

Forest Service Inventoried Roadless or Roadless Conservation Rule Areas

No Inventoried Roadless or Roadless Area Conservation Rule Areas are located within the analysis area.

Effects

This section describes the effects of the proposed action.

Developed Recreation

The Summit Lake Campground is located within the analysis area.

Helicopter landing zones,conventional landings, hazardous fuels reduction, and a fuel break are proposed adjacent to Summit Lake Campground andDay Use Area. .Proposed timber harvest units mayenhance wildlife viewing. The fuel breaks are consistent with Forest Plan guideline TR12.

General Forest Areas (Dispersed Recreation)

Timber harvest units may enhance wildlife viewing and hunting opportunities within the project area.

Scenery/ Visual Quality Management

The primary viewpoints that were used to evaluate the effects of the alternatives on the scenic/ visual quality resources of the project area include Summit Lake Campground/Day Use Area, the SR 39/55 portion of the Highland Scenic Highway the North Fork of the Cherry River, Forest Service trails, open and gated Forest Service roads, and associated dispersed campsites.

There are 8 units totaling 242 acres proposed for ground-based regeneration harvest. Units R3, R4, and R5 are located within foreground 1(fg1) in a high scenery level concern zone. Units R6, R8, R9, R10, and R74 located within fg1 in a moderate scenery level concern zone. There are 3 units totaling 109 acres proposed for helicopter regeneration harvesting. Units R1 and H2 are located within fg1 in a high scenery level. Unit H7 is within mg1 in a moderate scenery level. No regeneration units are visible from primary viewpoints along the Highland Scenic Highway (HSH) or North Fork of the Cherry River. Only unit R6 will be seen from gated road FR946 by hunters or other non-motorized users of the area.

There are 48 units, totaling 1,519 acres proposed for ground-based conventional thinning. A total of 7 units, totaling 200 acres are proposed for ground based conventional thinning along with prescribed burning. There are 14 units, totaling 741 acres proposed for helicopter thinning. All units are consistent with the SMS and will not change the landscape character of the project area.

There is one unit, totaling 157 acres, proposed for prescribed burning without thinning. 3 units, totaling 16 acres areproposed as fuel breaks.

Generally, from the primary viewpoints identified above, most of the proposed timber harvesting activities will either not be noticeable or only noticeable for a short duration while traveling along a road or trail. With the exception of Unit #T101 (fuel break) which can be seen from the Summit Lake Trail in the immediate foreground, units H15, H63, H25, H59, H60, and the prescribed burn block which can all be seen from the 39/55 portion of the Highland Scenic Highway. Units T36, T44, T53, T89, and T100 can be seen from State Route 35/3 near Summit Lake. Visual effects from viewpoints in the foreground and harvesting in the middle-ground and background should be relatively short-term (2-5 years).

The visual affects of these proposed harvesting activities will be more noticeable to hunters and other visitors using the local forest roads within the project area to access specific recreation activities such as hunting, fishing, and access to trails.

Implementation of the proposed action will continue to maintain the textured visual pattern of the area.
Temporary roads will be decommissioned within 3 years of the end of the project. This will mitigate any affects to the landscape character resulting from road reconstruction.

All proposed actions are located in Management Area 3.0 and is consistent with the Monongahela National Forest Land and Resource Management Plan and Standards and Guidelines for Recreation Management (pages: 164, 169-171)

/s/ Matthew J. Edwards, South Zone Recreation Manager
19 years of experience in Recreation Management with the USDA Forest Service
Former R9 representative on the Wilderness Information Management Steering Team
BA in Parks and Resource Management

USDA
United States Department of Agriculture

Gauley Health Forest Restoration

Categorical Exclusion

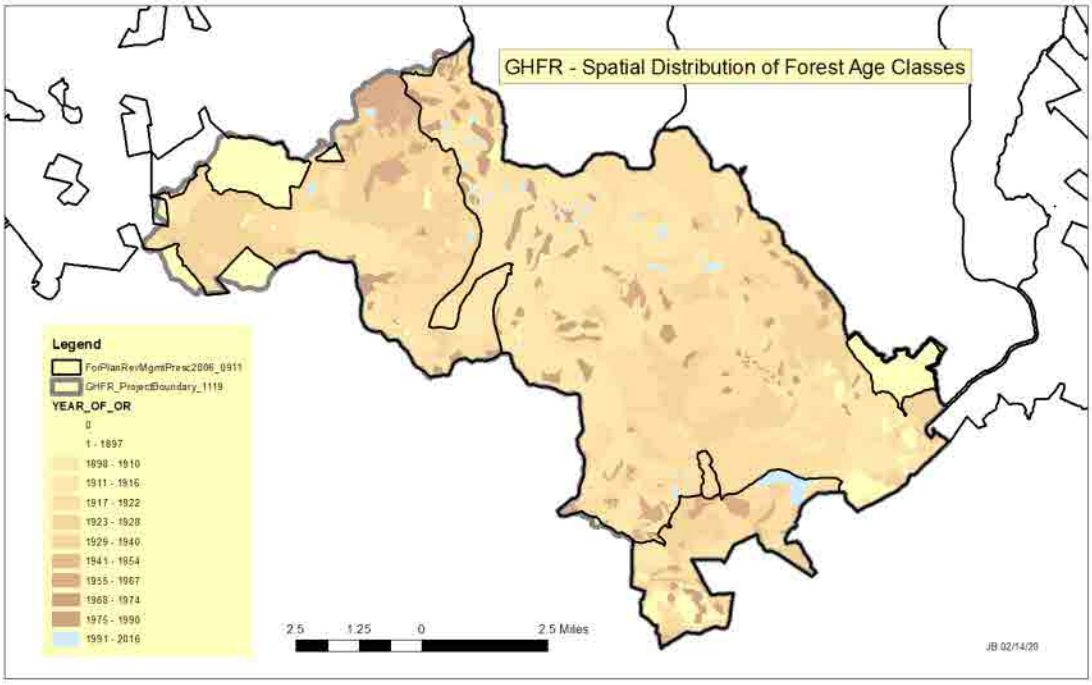
Effects on Vegetation

Forest Service
Monongahela National Forest

January 2020

Existing Condition

The Gauley Healthy Forest Restoration project area is composed of mostly contiguous forest stands that originated between 1900 and 1930 when the owner Cherry River Boom and Lumber Company built and used an extensive system of logging railroads to harvest their entire land ownership. Stand age, as shown on the map, is determined by counting tree rings on sampled trees, or by the year of timber harvest.



The following table shows the approximate distribution of age classes for forest vegetation within the project area, using the categories for age class desired conditions on page III-6 of the Forest Plan. Also shown are approximate acreages of private and non-forest vegetation. Vegetation GIS layers were cut to the project area, and the GISR FSVeg 2018 layer was used for the most part, for these calculations. However, the land ownership layer provided the acreage in private

lands. An additional layer that was used was the Maintained WL opening layer from 2009.

Private lands	Water*	Non-forest**	Maintained Wildlife Openings***
2023	187	998	143

Maintained Wildlife Openings***	Early Successional Forest (0-19)****	Early-Mid Successional Forest (20-39)	Mid Successional Forest (40-79)	Mid Successional Forest (80-120)	Late Successional Forest (>120)
143	94	673	3228	39753	860

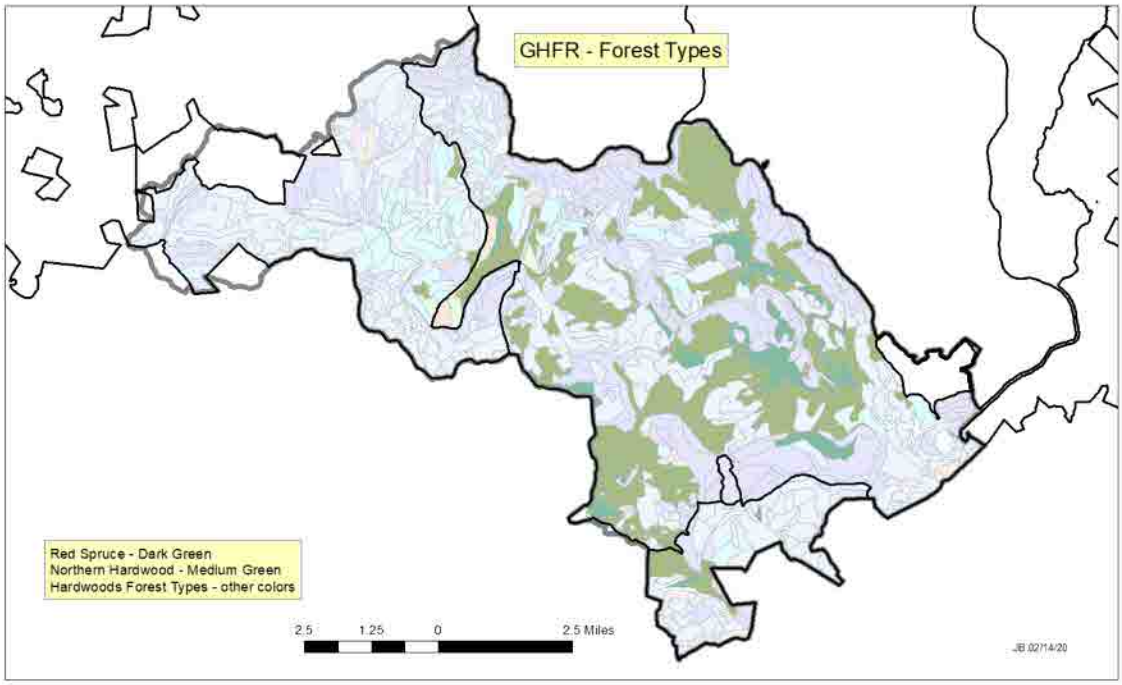
*Water includes portions of the North Fork of Cherry, Cranberry River and Summit Lake.
**Non-forest includes stands with data base land classes in the 200 series, which includes a variety of wetlands, mine sites and 777 acres of the Cranberry Glades. The Cranberry Glades includes a substantial amount of forested area, however it is included here. The mine sites could also be considered as forested, since most of them have tree cover, particularly planted pines which are of commercial size.
*** Maintained wildlife openings were taken from a different layer than FSVeg, which includes some small patches of open areas within other stands. Combining the maintained wildlife openings and non-forest lands gives a better picture of small amounts of open or non-forest lands scattered within the project area.
****Early successional forest includes 59 acres of recently regenerated stands in the Desert Branch area, as well as an estimated 35 acres which were blown down by the 2016 tornado, mostly in the Summit Lake area.
The total acreage contained in the FSVeg layer is 47937. The total presented above is approximately 20 acres larger, because of rounding, and the use of the land ownership layer and the maintained opening layer for several of the acreages. While calculating the acreage in each category, I viewed each selection for approximate accuracy, and compared the selections to personal knowledge of the area, but it should not be considered to be accurate to the nearest acre.

The Forest Plan established a Desired Vegetation Condition within each Management Prescription, for each forest type group, based on age class. All of the early successional forest listed above is Appalachian Cove Hardwood and it is within Management Prescription 3.0. Within this MP, the DFC is 12-20% in early successional forest. Within the 11,061 acres of national forest system land in MP 3.0 in the project area, 94 acres, or 0.8% is currently in the early successional category.

Forest Types in the eastern portion of the project area can mostly be classified as Appalachian Cove Hardwoods. Moving towards the east, the elevation increases and the forest regenerated as Northern Hardwood types and Red Spruce for the most part. Red spruce forests make up substantially less acreage than prior to the cutting, both within the project area and range wide. A variety of hardwood forest types are shown on the map, but not detailed specifically, since they can be grouped as Appalachian Cove Hardwoods, and Northern Hardwood. A few stands have been typed as Northern Red Oak, or as Mixed Oak, primarily in the Hacking Run drainage.

Although they are currently listed as oak types, the detailed stand descriptions show little or no oak component other than northern red oak. The Forest Plan considers red oak stands to be in the Appalachian Mixed Hardwoods Type (p. A –11)

The areas classified as Northern Hardwood are similar to the Appalachian cove hardwood stands, but are more dominated by maples, beech and birch and generally have fewer tree species in plot data.



Site productivity, as the ability of the forest stands in the project area to produce wood products. It has been estimated using the most commonly used method of expressing forest site quality: site index (p. 197, Johnson, Shifley and Rogers). Total height and age of a typical tree or trees in each stand was measured in the field and classified according to site index curves appropriate for the species and location. Site indices for oak are mostly above 76 up to 100, which indicates that volume growth is over 100 cubic feet per acre per year. For yellow poplar, they are mostly above 100 which indicates volume growth over 173 cubic feet per acre per year. These are considered high site indices, appropriate for timber production.

The age class distribution map shows few young stands established by regeneration harvests (clearcuts or clearcuts with reserve trees). However, many stands have been thinned commercially in the past. Thinning is a partial harvest to remove some trees, allowing more room for others to expand and grow.

Forest health within the project area is impacted by several abiotic and biotic factors. Abiotic factors are primarily weather related, and include frequent ice storms, both regional and local, late frosts, and wind events. Noteworthy, recent, region-wide storm events impacted the project area, including the Derecho and Hurricane Sandy in 2012 and flooding in July of 2016, along with the EF1 tornado in June 2016. Storm events impact forest health by tree and limb breakage and blowdown. Wood rot fungi enter trees through such breaks and have long term forest health effects. Winter storm damage can interact with the weight of vines in tree tops to damage and break more tree tops and large branches.

The project area is affected by the presence of several important forest pests: gypsy moth, beech bark disease, hemlock wooly adelgid and emerald ash borer. Field indications are that some of these insects and diseases have killed many trees, but this mortality has not been a stand replacement event, because they are species specific and unaffected species continue to grow. Even if all susceptible tree species died from one of these non-native invasive forest pests, the area would still be forested, because of the diversity of tree species represented within the area, and within each stand. These pests could result in high levels of mortality on particular species within the project area: gypsy moth- oaks and basswood; hemlock wooly adelgid- hemlock; emerald ash borer-white ash; and beech bark disease- American beech. Gypsy moth defoliates many other species, but within the area, the oaks and basswood are the species that occur in largest numbers that would be most heavily impacted in an outbreak situation. The red oak that is the most prevalent oak species in the project area is less preferred by gypsy moth than the white oaks; the very common tulip poplar trees are rarely defoliated by gypsy moths. White ash trees do not make up a large proportion of stands in this area, but nevertheless, recent mortality of white ash from the emerald ash borer is very noticeable.

Many native pests also occur within the project area, including the poplar weevil, poplar scale, Sugar maple borer, maple anthracnose, oak anthracnose and other insects and diseases.

Dead and dying trees are increasing due to the forest health factors described above, but also as a result of the aging forest. Frazer magnolia generally falls out of stands after 70 years (Burns and Honkala, 1990). Other species such as black locust, aspen and fire cherry have shorter average life spans, and have already contributed to the increasing number of dead trees in the forest.

Another factor contributing to the number of dead trees in this area is density dependent mortality. Overstocking is a significant factor in this area, with basal areas in some cases over 200 square feet per acre. Suppressed trees or those weakened by insects or disease are an additional component of tree mortality.

Dead and down trees or parts of trees contribute to a buildup of fuel on the forest floor. Because of the local climate and rainfall, this fuel generally decays quickly, reducing its contribution to fire risk. However, in long seasonal dry periods, such as occurred in late summer of 2016, these fuels can contribute to the risk and intensity of fires. One such late summer fire occurred

historically in the 1930's when the Black Mountain fire started in August and continued burning for two months, in logging slash and other fuels.

Standing dead trees, especially eastern hemlock, with its low, fine branches, or dead trees with persistent leaves, such as American beech, can contribute to fire spread.

Direct and Indirect Effects

Thinning and Associated Treatments

Forest Plan, page A2 "The thinning method is an intermediate cut that . . . removes high risk . . . low quality, diseased, and over mature trees to increase the health, development, and growth of the residual trees in a stand. . .. Thinning is applicable to all of the forest types found on the Forest."

Only one of the units to be thinned, T52 occurs in a stand classified as northern hardwood/spruce (type code 87). This code is used for northern hardwood stands with either spruce or hemlock. Detailed stand data from 2001 does not list red spruce in the stand composition, but does show about 10% of the stand composition to be made up of eastern hemlock. Red spruce, however, is a component of several of the stands for thinning in the Summit Lake vicinity, in the understory, midstory or overstory.

The primary purpose of treatment is stand improvement to develop resilient healthy stands more resistant to insects, disease, or fire. One way that thinning will have this effect is by maintaining appropriate tree species diversity mentioned above. Maintaining within stand diversity of species will help stands to resist species-specific insects and diseases and maintain a forested condition overall, even if some species are eliminated from the stand. In addition, insect and diseases may spread more slowly if host species density is low.

Some, but not all of the trees to be removed in the thinning treatment are dead, dying, or damaged from an active infestation of insects or disease (See Forest Service Handbook 2409.19 Chapter 70) such as hemlock wooly adelgid, beech bark disease, emerald ash borer, and other native pests. Many of the trees to be removed are actively infected by wood rot fungi related to damage from recurrent storm events (including the Derecho and Hurricane Sandy in 2012 and tornados in 2016) are also a major factor in the need to remove and salvage trees. Timber volume from salvage will vary depending on individual stand characteristics, but it is estimated to be less than 25 percent of the volume. Depending on timing of salvage needs, additional entry into specific areas could be needed for salvage.

Thinning is expected to remove about one-third of the basal area in a commercial harvest, which removes mostly sawtimber. Within treatment areas, large trees will be favored to be left to the extent that they are healthy and have potential to persist within the stand. Many large trees would be cut to salvage, or because of dead tops and branches, or because of active infestations of insects or diseases. Removing some trees by thinning, whether commercially or non-commercially, is part of an Integrated Pest Management method to minimize or prevent the development of pest problems (Forest Plan Goal VE26). In some areas, especially in or near the

fuel breaks and around Summit Lake campground, treatment may be needed in addition to commercial harvests or instead of commercial harvests if trees to be removed are not suitable for timber products.

Vine Control may be done in stands to be thinned– Forest Plan page A16. "Vines interfere with the growth of trees, causing decreased growth, deformity, and broken tops. Broken tops allow entrance for insect and diseases, decreasing the vigor of a stand. Vines are severed with cutting tools near the ground. (This treatment may be done three growing seasons prior to harvest.)

To the extent that thinning removes trees likely to die or contribute to down woody material on the forest floor through dead branches, it is expected to reduce fuels on the forest floor and thus reduce the risks of fire over time. Healthy trees remaining will have room for expansion to retain the health of the trees and shade the forest floor. Logging slash would provide short term additions to fuels.

The effect of thinning on forest vegetation is similar, whether helicopter or ground based skidding is used. Excavation, use and decommissioning of roads for timber removal entails some tree removal which will contribute to the thinning treatment. After use, the road surfaces will contribute to forest floor function, with a variety of plants colonizing the surface. Stand level effects of most roads previously used for harvesting are difficult to discern on leaf-on aerial photos, because trees on either side have grown over the road itself, fully utilizing the additional space for photosynthesis and to some extent, for root growth. Landings restored after completion of the project are likely to persist mostly in herbaceous vegetation for several years, before tree seedlings and saplings begin to colonize them.

Within the stands with both thinning and prescribed burning, thinning will open up the crown canopy and additional oak seed production is expected to result. Thinning, and to some extent, burning, will increase light reaching the forest floor. The burning is expected to reduce the expansion of fire intolerant understories, including red maple, sugar maple and striped maple. Broadcast burning may result in some mortality or damage to larger trees, for example those with fuel or open cankers at the base of the tree, but this effect would be minor at the stand level, and would not open up the overstory canopy to the extent that thinning would. Oak leaf litter will be reduced. The resulting effect will be to enhance oak regeneration initiation and development on the forest floor of these stands. Currently, both numbers and size of oak seedlings present within the stands to be thinned would not be sufficient to compete well with maple and Appalachian cove hardwood seedings in the understory, or if a natural event such as blowdown or wildfire were to occur.

Within the area where broadcast burning is planned, without a thinning treatment, oak advance regeneration effects would not be as pronounced, since dense overstory trees would not have increased seed production, and light on the forest floor would not increase to the same extent. Oak leaf litter and understory would still be removed or killed by fire. Fuel would be removed in both treatments. Firewood permits would help to reduce additional fuels.

Fuel breaks within the thinned areas would maintain the open understory over time for the purpose of reducing fuels and increasing access near private lands. Private lands protected include both forested and grassy areas. Near open grassy areas, burning of piles would help to reduce the rapid regrowth of vegetation that can sometimes result in forest areas exposed to sunlight. Near forested areas, regrowth of understory would be similar to that occurring in other thinned forested areas.

Clearcutting (Regeneration) and Associated Treatments

Clearcutting (Regeneration). Forest Plan, page A2 "The clearcutting method harvests most or all of the trees within a stand in one removal. Typically, some reserve trees are left to meet wildlife habitat or other resource needs." Commercial timber harvest involves the use of hand or mechanical felling and removal from the forest by helicopter or skidder. Firewood gathering opportunities may be provided with these treatments also, as described under thinning.

The primary purpose of treatment is to develop healthy resilient young stands that will be more resistant to insects, disease, or fire in the long-term. Up to 10 percent of timber to be removed may be salvage of material that is dead, dying, or damaged from an active infestation of insects or disease. This percentage is smaller than the salvage quantity from thinning, because almost all trees would be removed in the regeneration (clearcut with residual) treatment, and thinning focuses on removing the highest risk trees, and so would include a greater percentage of salvage.

Associated with the clearcutting treatment is ***Site Preparation with Hand Tools for Natural Regeneration*** – Forest Plan page A15. "The objective of site preparation is to enhance germination, sprouting, and survival of natural regeneration. Site preparation includes cutting down residual trees between 1 and 5 inches in diameter during or immediately after a regeneration harvest. Normally red spruce, hemlock, dogwood, serviceberry and shrub species that produce mast for wildlife are not cut. This treatment opens up the forest floor to increased sunlight to improve seed germination potential, promotes sprouting of cut trees, and reduces shading that could inhibit the growth of shade intolerant and moderately tolerant species."

Vine Control may be done in stands to be regenerated– Forest Plan page A16. "Vines interfere with the growth of trees, causing decreased growth, deformity, and broken tops. Broken tops allow entrance for insect and diseases, decreasing the vigor of a stand. Vines are severed with cutting tools near the ground. (This treatment may be done three growing seasons prior to harvest to prevent sprouting of vines during the regeneration period that would harm young trees.) Cutting vines in advance of harvest, in combination with deer browse on the sprouts that result, reduces the number of sprouting vines (grapevine and camphor vine) to a level that regenerating trees can develop and grow freely. Vines that originate from seed at the time of harvest are not as damaging as sprout origin vines, and will develop without destroying young seedlings. They may be cut to release young trees as part of crop tree release.

The potential for deer-browse damage to regenerating stands is a factor relevant to the project. Deer browse has impacted regenerating areas near the project area, to the extent that planting was required in a few stands in the late 1990s to supplement the diversity of natural regeneration.

Additional associated treatments may be included as needed to enhance regeneration such as hand tree planting, fencing, or caging to protect from deer browse, weeding to enhance species composition, and treatment of non-native invasive plant species. These treatments would involve hand tools and hand labor, which would involve minimal ground disturbance. Scalping of each planting spot with hand tools, spot spraying of herbicides, or individual tree fertilization could be part of the tree planting methodology. These potential treatments would occur during the regeneration period (normally 1 to 5 years after the harvest and site preparation) and are done with hand tools. Natural regeneration is typically rapid and successful in this area, so tree planting and associated treatments are unlikely to be needed on more than 100 acres, and planting could be used to enhance species diversity.

Crop tree release (Forest Plan, page A – 16) may be done within regenerated areas to increase tree species diversity that would further enhance resistance to insects, disease, or fire. Integrated Pest Management methods would be used to minimize or prevent the development of pest problems, and could include the use of insecticides, for example, to preserve hemlock trees facing mortality from hemlock wooly adelgid (VE26, 27, 28, 29, 32, 34, 35, 36, and 37). It is anticipated that use of insecticides within the project area would be unlikely to be needed on more than 20 acres overall, with less than 20 stems per acre being treated in most cases.

Herbicide. Forest Plan page A16. This treatment will be used to control competition with diseased beech sprouts, only in stands where beech bark disease occurs and has resulted in dense competition that excludes tree and understory species. In most cases, it will be possible to control competition with diseased beech sprouts by cutting alone, as described above in **Site Preparation with Hand Tools for Natural Regeneration**. The percentage of American beech in stands for regeneration, based on plot data, varies greatly, from no beech in plot data to over 50% of the basal area in beech. Diseased American beech trees should not be left standing in regeneration cuts, since the resulting diseased beech thickets are not a desired outcome of the treatment. For herbicide treatment of diseased beech, herbicides would be applied to individual stems by stem injection (cut surface treatment) or basal spray, both methods using manual labor. This treatment is operationally easier to accomplish prior to harvest, when walking through the stand is easier. In some cases, especially where beech thickets have been developing over decades, opening up the understory with herbicide treatments can be more effective at enhancing the diversity of regeneration following the harvest, allowing advance regeneration to develop over a period of several years. The goal of herbicide treatment, where needed, is to remove diseased beech sprouts from the regeneration of healthy, diverse species that is expected to result from seedling sprouts, seeds mostly from the seedbank, and stump sprouts.

The effect of regeneration using clearcut with residuals and associated treatments is expected to result in healthy, resilient stands of young trees that add 351 acres, or 3.2% of the 3.0 MP portion of the project area, to the early successional forest which is part of the desired future condition of Forest Plan MP 3.0. All of these harvests are within MP 3.0. When combined with the 94 acres of early successional forest already present, the percentage of early successional forest in MP 3.0 within the project area would be 4%. This is less than the Desired Vegetation Conditions in MP 3.0, which is 12-20-% of the Mixed Cove Hardwoods Forest Community.

There is little or no difference in effects on vegetation in clearcutting with residuals between units harvested with helicopter and those harvested with ground based systems, in regeneration harvests. Compacted areas of skid roads generally develop fewer seedlings and may have more unvegetated soil for a period of time, but crown closure provides complete coverage between age 5 and 13 after the harvest. An additional feature of skid roads is that they provide access for deer, with resultant browse damage and reductions of tree species diversity in the short term along the road corridor.

Emamectin benzoate, Imidacloprid, Dinotefuran and neem oil may be used if needed to retain or protect individual trees as elements of diversity. Since they would be applied by hand if needed to individual trees, they would only protect a few trees from insects (up to 20 trees per acre on up to 20 acres), and would have negligible harmful impacts on pollinators and tree seed production, even in the short term.

There are no planned actions within or near the project area that would have cumulative effects when combined with the Gauley Healthy Forest Restoration project actions.

Timber Harvest treatments within the GHFR project CE comply with the National Forest Management Act requirements, except for the typographical error on page 7. One regeneration unit is listed as 41 acres, which is greater than the maximum size for clearcut regeneration areas, which is 40 acres, under NFMA.

All treatments are appropriate for the Forest Types to be treated. Clearcutting is the optimum method to regenerate Appalachian (also called Mixed Cove Hardwoods) Cove Hardwoods where a diversity of tree and shrub species that are intolerant of shade are a desired component of the regenerated forest.
Single tree selection and group selection were not appropriate, in that these treatments would have increased the amount of American beech, hemlock and sugar maple within the stands, and reduced overall numbers and types of tree species present in the regenerated stands. Maintaining and increasing the diversity of tree species is a factor that helps trees to better resist insects and forest tree diseases. Since American beech and hemlock in this area are being actively impacted by Beech bark disease and hemlock wooly adelgid, these treatments would reduce the health and resilience of the forest, had they been chosen. See Appendix A, Forest Plan.
Two aged and shelterwood harvests were not selected, since they were not needed to regenerate the desired mix of healthy, diverse trees of varied shade tolerance.
Commercial thinning is an appropriate treatment to achieve the goals of the project in the stands to be so treated.

United States Department of Agriculture

Gauley Health Forest Restoration

Categorical Exclusion

Effects to the Soil Resource

Forest Service
Monongahela National Forest

March 2020

Existing Condition

Approximately 70% of the project area is mapped as having high acidic deposition risk (USDA Forest Service, 2006). Soil acidification is the net result of acid inputs (primarily acid rain) and mineral weathering (breakdown of bedrock) (Weil and Brady, 2017). On the MNF, soils that have been impacted by acidic deposition have limited stores of plant available base cations, including calcium which is essential to healthy tree growth (Huntington, 2000; Jenkins, 2002; Johnson and Todd, 1990). To summarize, acidic deposition and heavy soil disturbance, soil loss, and soil mixing could result in soil chemistry that is unfavorable for plant growth and survival due to nutrient loss (Cronan and Grigal, 1995). Soil wetness and carbon loss sensitivities also exist throughout portions of the project area (USDA Forest Service, 2006; Soil Survey Staff, 2020).

Direct and Indirect Effects

Conventional Timber Harvest

A total of 1,934 acres of conventional timber harvesting is proposed. Timber harvesting has limited impacts to soil quality and productivity and would occur on slopes suitable for timber management. Erosion should be prevented and revegetation promoted due to project design and placement of units combined with following the MNF Land and Resource Management Plan standards and guidelines and BMPs (USDA Forest Service, 2006; USDA Forest Service, 2012). Removing trees from the site (through timber harvest) would result in calcium removal from the ecosystem. This effect is lessened by the retention and dispersal of tops and limbs within each unit because the majority of calcium in trees is contained in the tops and limbs (Ovington, 1958). The dispersed disturbance anticipated throughout timber harvest units would result in non-detrimental effects to soil quality and productivity.

Helicopter Timber Harvest

Helicopter timber harvesting is proposed on 880 acres. Helicopter yarding minimizes the amount of soil disturbance that occurs because no skid trails are used to move the logs from the units to the landings. No detrimental effects to the soil resource are expected within helicopter harvest units.

Temporary Roads

A total of 29.5 miles of temporary road construction and 32.3 miles of temporary road reconstruction is proposed which would result in 44 and 50 acres of soil disturbance (respectively). Construction and use of temporary roads require the removal of topsoil and blading of the soil surface on slopes greater than 20% for equipment operability. Placement of the temporary roads would utilize breaks in terrain, avoid steep slopes where feasible, and follow all Forest Plan standards and guidelines, BMPs and timber sale contract provisions (USDA Forest Service, 2006; USDA Forest Service, 2012). These actions would minimize or avoid disturbance to soil properties such as detrimental soil erosion and excessive compaction. It is expected that temporary soil compaction would occur on temporary roads in discrete locations resulting in detrimental effects in those areas, which is expected to recover soil productivity and function in 5-7 years. All temporary roads would be decommissioned after use for this project.

Log Landings

The construction of 13 conventional and 4 helicopter landings is proposed (13 acres). Selection of landing locations would be placed on gentle terrain. Truck traffic and skidder operations would churn the soil surface and expose mineral soil leading to on-site soil erosion within the footprint of the log landing. The combination of careful site selection and management of the log yard during use would minimize or avoid disturbance to soil properties such as detrimental soil erosion and excessive compaction. The reconstruction of 20 conventional and 3 helicopter landings is also proposed. Reconstruction and use of these landings would reverse the soil recovery that has taken place on these existing features since the last timber entry and would result in approximately 15 acres of soil disturbance resulting in non-detrimental soil disturbance and discreet areas of detrimental soil disturbance due to compaction and nutrient loss. These impacts would recover soil productivity and function by activities put in place to reclaim the landings, including backblading and leveling to ensure positive drainage and seeding and mulching to establish ground cover.

Prescribed Fire, Fuel Breaks and Pile Burning

Prescribed fire is proposed on 357 acres. Prescribed fire is restorative to a landscape where fire is an inherent part of the nutrient cycling process (Boerner et al., 2006). Nutrient levels in areas of prescribed fire should generally increase. Soil carbon losses are expected in areas where inclusions of thicker organic horizons may exist from historic vegetative cover. Low to moderate intensity prescribed fire is not expected to result in detrimental soil disturbance.

Natural features (existing roads, rivers, trails, streams, etc.) would be utilized as fire breaks to the extent possible. No dozer line creation is proposed, but some handline may be required. Handline is created using leaf blowers (no soil disturbance) or hand tools to scarify the soil surface (exposing mineral soil). If the latter is required, this action would result in non-detrimental soil displacement and erosion.

Fuel breaks (totaling approximately 75 acres) are proposed around Summit Lake and Richwood. These areas would be treated with thinning for the purpose of fuel reduction. Slash and debris less than 6” in diameter would be hand piled and burned. Unlike in timber harvest units where slash and limbs are left scattered throughout the unit, the slash and limbs within fuel breaks will be concentrated into piles and burned, resulting in nutrient losses (Curzon et al., 2013; Slesak et al., 2016). Busse et al., (2013) concluded that for piles where the majority of the wood was less than 8” diameter, soil heating was moderate and would not cause major shifts in soil quality. Given the soil resource conditions in the project area, it is likely that pile burning will not result in detrimental soil disturbance due to nutrient losses. Nutrient loss would be minimal from burning slash and would be localized and limited because slash piles would be burned during times when either snow is on the ground or when there is enough moisture in the soil to prevent the spread of fire. This would be consistent with low and moderate fire danger days. The litter layer and organic matter would be kept in tack throughout the rest of the stand and nitrogen fixing plants are expected to colonize sites following fire to help restore nitrogen to the ecosystem.

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February 27, 2020

Gauley Healthy Forests Restoration Project
Summary of Impacts to Wild and Scenic Rivers
Matt Edwards – District Zoned Recreation Manager

Wild and Scenic Rivers

Eligible Wild and Scenic Rivers (WSR) segment in Gauley Healthy Forest Restoration (GHFR) project area:
The GHFR project area includes 5.9 miles of the North Fork of the Cherry River, however only 3.9 miles overlap with proposed management. The Wild and Scenic River Study completed by the Monongahela National Forest in 1995 identified a 10.8 mile segment of the North Fork of the Cherry River as an eligible wild and scenic river. The classification was for a recreational river segment with outstandingly remarkable values (ORV) of scenery and recreation. This segment is listed as eligible for possible inclusion into the wild and scenic river system at a future point. Management actions that retain the free-flowing condition, the highest classification potential, and the outstandingly remarkable values are consistent with the eligible designation. The following table from the Monongahela National Forest Land and Resource Plan p. III-6 identifies the ORVs for each segment of eligible WSR within MP 3.0.

Eligible Wild and Scenic River Segments in MP 3.0			
River Name	**Classification**	**Outstandingly Remarkable Values**	**Miles**
North Fork Cherry River	Recreational	Scenery, Recreation	10.8
Glady Fork	Recreational	Recreation	2.8
Laurel Fork	Scenic	Recreation	4.4
Williams River	Recreational	Scenery, Recreation	7.3

Direction related to management along eligible WSR segments:
For eligible recreational river designations, some management actions may be approved within the one-quarter mile on either side of the eligible river segment. For vegetation management within Scenic and Recreational classifications, the Forest Service Handbook 1909.12 chapter 80, Wild and Scenic Rivers, states that a range of vegetation management and timber harvest practices are allowed, if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character and prescribed fire and wildfires managed to meet resource objectives may be used to restore or maintain habitat for threatened, endangered, or sensitive species or restore the natural range of variability.

Description of effects to eligible WSR segment from GHFRA project:
The project proposes vegetation thinning actions along 2.2 miles and prescribed fire along 1.7 miles of the eligible segment of the North Fork Cherry River. The thinning and prescribed fire activities will result in healthy forest stands more resilient to insects, disease, and weather disturbances. Therefore, improving the scenic and recreational values of the river. Impacts may be seen by visitors during implementation of treatments. However, these are expected to be short in duration, likely only one growing season. A more resilient forest maintains scenic values and safety. Large scale die-offs or damage to the vegetation will be less likely following these treatment actions. Overall, the project is not expected to have any measurable or lasting impacts on the ORV of scenery and recreation for this river segment.

Gauley Healthy Forest Restoration Project

Background Rationale for Development of WUIs in the Project Area

February 4, 2020

Written by John Fry

The Forest Service manages more than 192 million acres in the National Forest System (NFS). An estimated 58 million acres of this land are at high risk of ecologically destructive wildland fire (Forest Service Wildland Fire Activities – Hazardous Fuels Reduction, July 2016). Excessive amounts of fuel build up is a serious problem that can add wildland fires, which has caused an increasing number of large, intense, and catastrophically destructive wildfires that can be difficult to contain. It has been estimated that these hazardous fuels are accumulating three times as fast as they can be treated (Forest Service Wildland Fire Activities – Hazardous Fuels Reduction, July 2016). Reducing the buildup of hazardous fuels is important in reducing the extent, severity, and cost of wildfires.

Hazardous fuels reduction projects have been proven as a means of mitigating wildfire hazards to lessen catastrophic fire and its threat to public and firefighter safety and property. The objective is to remove enough fuel so that when a wildfire burns it reduces the wildfire severity and can be more easily suppressed making suppression actions safer for fighters. Hazardous fuels reduction treatments can be the most effective way to protect communities, restore forest and grass land health, improve firefighter and public safety (Forest Service Wildland Fire Activities – Hazardous Fuels Reduction, July 2016).

Recognizing the need to reduce the threat of catastrophic wildfires and improve the health of the nation's forest, President Bush announced the Healthy Forest Initiative (HFI) on August 22, 2002. HFI, a combination of administrative initiatives and legislative changes, provided additional tools needed to reduce wildland fire risks, control insects and disease and restore forest health. This included improving procedures for developing and implementing hazardous fuels reduction projects.

On December 3, 2003, President Bush signed the Healthy Forest Restoration Act (HFRA) into law. In passing HFRA, Congress provided additional tools to fully implement HFI. The legislation included a variety of provision aimed at expediting the preparation and implementation of hazardous fuels reduction projects on Federal land and assisting rural communities, States, and landowners in restoring forest conditions on State and private lands. Communities have become increasingly part of at-risk areas known as the wildland-urban interface (WUI), creating a greater challenge for fire protection. HFRA required allocating at least 50 percent of Federal HFI funds to WUI acres. HFRA gives priority to projects and treatment areas identified in a community Wildfire Protection Plan (CWPP) and directs Federal agencies to give specific consideration to fuel reduction projects that implement those plans.

On November 2016, the Great Smoky Mountains National Park near Gatlinburg, TN experienced one of the largest natural disasters in the history of Tennessee. On November 23, 2016 a human-caused wildland fire started in the Chimney Tops area of Great Smokey Mountains National Park. Over the course of the next five days, the fire, known as the Chimney Tops 2 Fire would grow and under extreme weather conditions leave the park boundary on November 28, 2016. High Winds and dry fuels would push the fire from the park and causing numerous new wildfire starts from embers carried far in front of the main fire. The Great Smoky Mountains wildfires claimed the lives of 14 people and damaging 2,545 structures. These fires were the deadliest wildfires in the Eastern U.S since the Great Fires of 1947 which

killed 16 people in Maine. In August 2017, U.S Secretary of the Interior Ryan Zinke issued an independent review of the Chimney Tops 2 Fire. The report also provides a summary of findings and recommendations that included implementing the goals of the National Cohesive Wildland Fire management Strategy, which prioritizes healthy and resilient landscapes, fire adapted communities, and safe and effective response. This includes efforts to actively manage vegetation and fuels effectively, removing dead and dying trees (Chimney Tops 2 Fire Review, Individual Fire Review Report).

Changes in wildland fuels resulting from land management practices, climatic change, and decades of fire suppression have all conspired to create a fire exclusion problem. Fire records on the Monongahela National Forest indicate a startling trend in the increase in size and complexity of wildfires on the forest. From 1970 to 2012, there were 4,528 acres or an average of 108 acres per year were consumed in wildfires. Since 2013, there have been a total of 3,969.4 acres or an average of 567 acres per year consumed in wildfires. Creating fuel breaks in identified areas may prevent devastating wildfires similar to what occurred in Gatlinburg, Tennessee from negatively impacting both Forest and privately property.

The Healthy Forest Restoration Act Title I; Hazardous Fuel Reduction on Federal Land Section 101 defines “at-risk community” as an area that is comprised of (i) an interface community as defined in the notice entitled “Wildland Urban Interface communities Within the Vicinity of federal Lands that are at High Risk From Wildfire”. This notice provided a list of urban wildland interface communities in the vicinity of Federal lands that are at high risk from wildfire published on January 4, 2001. There are 167 towns located in West Virginia that are identified as “at risk communities”.

The Interdisciplinary team (ID) defined the WUI area, “at-risk communities”, USFS/privately owned structures and water municipal supply systems within the project boundary based on criteria stated within the HFRA of 2003. The team identify nine areas (Richwood, Summit Lake, Briery Knob, Cranberry Mountain Nature Center, Falls of Hills Creek, South Fork Cherry River, Round Mountain, Cranberry River, and Kennison Mountain) within the project area that met the criteria stated in the HFRA. However, due to the 3000 acre limitations per Section 603 requirements resulted in prioritizing these at risk areas. Notwithstanding the 3,000 limitation, other WUI areas could have been developed for consideration and analysis.

Richwood and Summit Lake areas were selected by the team as locations within the project area to implement this project. Under section 101, an “at-risk-community” is defined as a group of homes and basic infrastructure and services (such as utilities and collectively maintained transportation routes within or adjacent to Federal land, or which conditions are conducive to large-scale wildland fire disturbance event); and for which a significant threat to human life or property exists as a result of a wildland fire disturbance event. We looked at the Federal Register of 2001 to see what communities meet this criterion. The town of Richwood which is located adjacent to the project area was listed in the Federal Register of 2001 as an Urban Wildland Interface Community within the vicinity of federal lands that is at high risk from wildfire.

Summit Lake is a municipal water supply and sole source of drinking water for the town of Richwood (population exceeding 2000). Lands categorized under Section 102 as condition class 2 or condition class 3 within fire regime I, fire regime II, or fire regime III, in close proximity to a municipal water supply

system or a stream feeding a municipal watershed creates a significant risk that a fire disturbance event would have adverse effects on the water quality of that municipal water supply or the maintenance of that system. This includes a risk to water quality posed by erosion following such a fire disturbance event. A wildfire that were to threaten the Summit Lake watershed there could be lasting negative effects on the town of Richwood's water quality and its treatment system could be compromised. The HFRA also identifies an "at risk community" as a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) with or adjacent to Federal land. A wildfire that were to occur in this area could negatively impact Forest visitors by compromising egress routes potentially trapping vistors.

The ID team then looked at what would be an adequate "fuel break" to protect communities along the Forest Service Boundary and the Summit Lake Watershed. The HFRA allows natural or manmade changes in fuel characteristics to affect fire behavior such that a fire can be readily controlled. These areas were originally identified theoretically by using a ½ mile radius and later expanded to 1 mile radius based on an Assessment Analysis Area completed on the Francis Marion National Forest.

The International Code Council's (ICC's) International Urban-wildland Interface Code rates WUI into three categories and the distance to create defensible space along urban interface areas.

WILDLAND-URBAN INTERFACE AREA	FUEL MODIFICATION DISTANCE (Feet)
Moderate Hazard	30
High Hazard	50
Extreme Hazard	100

Based on slope, aspect, accessibility, and fuel type, it was determined to use 100-foot fuel modification (fuel break) distances to treat along private property boundaries, forest service infrastructure, and municipal watersheds (Summit Lake). Fuel breaks will consist of removing dead and down trees, pruning limbs of larger trees, and removing brush/vines and some small diameter trees. Slash created from harvest operations will be mechanically or hand piled and burned or pulled away from private property or Forest Service infrastructure by the contractor approximately 100 feet from Forest Service boundary. Fuel breaks will be created and maintained annually as needed. A variety of treatments may be used to maintain effectiveness of fuel breaks that includes broadcast burning, mowing/mulcher, chipper, and burning piles.

Within the project area, the HFRA also allows for prescribed fire to be implemented in areas where vegetation has been moderately altered from those that existed historically. This would include condition classes 2 and 3. We looked at the report "Development of coarse-scale spatial data for wildland fire and fuel management" (Schmidt, Kirsten M., Menakis, James P., Hardy, Colin C., Hann, Wendel J., Bunnell, David L., April 2002) to identify if there were any areas mapped as condition classes 2 or 3 within the project area. A relatively small area less than 250 acres within the project area was identified to implement prescribed fire. A prescribed fire unit that overlaps this area was developed to use natural features (drainages, ridges, rivers) or manmade features (roads) as holding lines that would limit the amount of disturbance on the landscape.

References

Chimney Tops 2 Fire Review, Individual Fire Review Report; National Park Service, U.S Department of the Interior, Division of Fire and Aviation 2017

Forest Service Wildland Fire activities – Hazardous Fuels Reduction, United states Department of Agriculture Office Inspector General, 08601-0004-41, July 2016

Schmidt, Kirsten M., Menakis, James P., Hardy, Colin C., Hann, Wendel J., Bunnell, David L., April 2002. (RMRS – 87) Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management. Missoula, MT: United States Department of Agriculture, Forest Service, Rocky Mountain Research Station

FWS GHFR Briefing & Questions
Monongahela National Forest | Gauley Ranger District
Gauley Healthy Forest Restoration Project Meeting Notes

3:00pm - 4:15pm Monday, May 10, 2021

Attendees: **FWS**: Jennifer Norris, Briana Smrekar, Riley Aulick. **USFS**: Richard Raione, Kim Tarter, Amy Lovell, Jake Geisel, Ken Hiser, Sarah Dezelin, Mike Owen, Justin Quick, Rosanna Springston, Kyle Tasker, Darrell Wright.

Richard: GHFR Stands for the Gauley Healthy Forest Restoration project. To quickly put it in context, the purpose of this project, falls under Section 603 of Healthy forest restoration act and implemented under the farm bill. Strict provisions include max of 3,000 acres, temporary roads must be decommissioned in 3 years, and some other restrictions. Formulated by congress to streamline some veg treatments for federal land management agencies. Fundamental takeaway to reduce the risk posed by wildland fire and insect/disease. Justin can give a more thorough overview.

Justin: This is a forest health initiative, so we are focused in reducing the impacts of insect and disease and reducing hazardous fuels. Important note, this is a CE. In our forest plan, there is the definition of forest health. (b)(5); Deliberative Process Privilege [redacted] The primary purpose of thinning is to release remaining trees and allow the remaining trees to get access to the resources they need to be healthy and resilient to insects, disease, and fire. Current conditions with our age, canopies are relatively small for the height of the tree, and we are not getting light reaching the forest floor. We can see the crowding of the canopy. Thinning opens up space and allows sunlight to reach more of the tree canopy, and reach the forest floor, which is important to maintain forests into the future. For clear-cuts, you remove most or all and allow everything to start over as a new forest. (b)(5); Deliberative Process Privilege [redacted]

Briana: (b)(5); Deliberative Process Privilege [redacted]

Justin: (b)(5); Deliberative Process Privilege [redacted]

Kim: That is also the standard that Jane has been using.

Briana: (b)(5); Deliberative Process Privilege [redacted]

Justin: We are not doing prescribed fire for oak regeneration, though we would like it to happen, but we are trying to reduce fuels. Rhododendron, beech thickets, and other vertical fuels can get fire from the floor to the canopy and have disastrous results. We are talking fuels that allow a fire to take off on the landscape. There is no fire-wise program in WV, so WUI may not be a familiar term. The wildland urban interface is a community with close interaction with the natural landscape. We are talking about communities at risk for wildfire for this CE. Prescribed fire helps reduce fuels, like leaf litter and brush. It is an ecological restoration tool, but that is not the focus of this project. Fuel breaks are important to create and maintain defensible space. If the forest is right on top of your house and you have no room to remove fuels, you cannot protect your house. Fuel breaks around private property and some structures around summit lake, and allows firefighters access to fight a wildfire. Pile burning is relatively routine practice across the forest. Piling the fuel and burning it in place, instead of chipping or hauling it off the site. There was a question about timing of the burning. This project is only proposing burning during dormant season, I hope that got clarified.

Briana: (b)(5); Deliberative Process Privilege [redacted]

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Briana: (b)(5); Deliberative Process Privilege [redacted]

Kyle: This project is focused toward the timber aspect and wildfire. (b)(5); Deliberative Process Privilege [redacted]

Briana: (b)(5); Deliberative Process Privilege [redacted]

Jen: (b)(5); Deliberative Process Privilege [redacted]

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Richard: (b)(5); Deliberative Process Privilege

Jen: I realize the Mon and other forest have a lot of obligations that you all have to follow, including the management plan and other actions the forest service puts down for you at the forest level. All of them are important. Our obligation under the ESA is to provide technical assistance and follow through the ESA. (b)(5); Deliberative Process Privilege

Richard: (b)(5); Deliberative Process Privilege

Jen: (b)(5); Deliberative Process Privilege

Mike: I wanted to chime in and say I appreciate that feedback. We want to follow the process. (b)(5); Deliberative Process Privilege

Jen: (b)(5); Deliberative Process Privilege

Briana: I want to jump in here. (b)(5); Deliberative Process Privilege

Briana: Did you have additional information that was included.

Kyle: (b)(5); Deliberative Process Privilege

Mike: (b)(5); Deliberative Process Privilege

(b)(5); Deliberative Process Privilege

Jen: (b)(5); Deliberative Process Privilege

Briana: After I have had time to review, I would like to reach out and ask more questions if there are any.

Richard: I propose that we could get together later this week or early next week, see where we are at with the questions and answers. (b)(5); Deliberative Process Privilege

Jen: (b)(5); Deliberative Process Privilege

Sarah: (b)(5); Deliberative Process Privilege

Briana

[FWS members hopped off call at 4:00]

Darrell: (b)(5); Deliberative Process Privilege

Sarah: (b)(5); Deliberative Process Privilege

Richard: Keep in mind to keep me in the loop for these meetings. (b)(5); Deliberative Process Privilege

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Richard: (b)(5); Deliberative Process Privilege [redacted]

Kyle: No.

Richard: That will help for prescribed fire in that area. We want to be open and facilitative with a reasonable way forward. (b)(5); Deliberative Process Privilege [redacted]

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Richard: (b)(5); Deliberative Process Privilege [redacted]

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Richard: (b)(5); Deliberative Process Privilege [redacted]

Kyle: (b)(5); Deliberative Process Privilege [redacted]

Richard: Need to follow up with the GW Jeff and see what they are doing at the VA field office.

Follow Up Items:

- **Jen: Get back to the FS team with any follow up questions and possible meeting dates/times.**

(b)(5); Deliberative Process Privilege [redacted]