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Environmental Assessment

Adjustments to Management of Four Grazing Allotments: Beale-Hacking, Day Run, Kramer and Mullenax

Marlinton Ranger District, Monongahela National Forest
Pocahontas County, West Virginia

For Information Contact: O'Dell E. Tucker
Monongahela National Forest
1103 Cemetery Rd.
Marlinton, WV 24954
304-799-4334, ext. 19
otucker@fs.fed.us

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SUMMARY

The Monongahela National Forest proposes to make adjustments to management and improvements (livestock facilities) on four grazing allotments. These are the Day Run, Beale-Hacking, Kramer, and Mullenax grazing allotments, all in Pocahontas County on the Marlinton Ranger District of the Monongahela National Forest in West Virginia. This action is needed because opportunities exist to further protect and improve the natural resources via changes in management and facilities in these areas.

The Proposed Action would continue to allow the grazing of livestock on these four allotments while making some adjustments to the way these areas are presently managed. Livestock facilities would also be improved or added.

In addition to the Proposed Action, the Forest Service also evaluated the following alternatives:

- *A No Action alternative*
- *An alternative where no herbicide would be used to control noxious/non-native/invasive vegetation*

Based upon the effects of the alternatives, the responsible official would decide which alternative to approve for implementation.

Document Structure

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and Alternatives. The document is organized as follows:

- **Chapter 1- Purpose and Need for Action:** This chapter includes information on the history of the project proposal, the purpose and need for the project, and the agency's proposal for achieving that purpose and need.
- **Chapter 2- Alternatives Considered:** This Chapter details how the Forest Service informed the public of the proposal and how the public responded. It also provides a more detailed description of the agency's proposed action as well as the alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the public and other agencies. A comparison table of the alternatives is also provided.
- **Chapter 3- Affected Environment and Environmental Consequences:** This Chapter describes the existing conditions and the environmental effects of implementing the proposed actions and other alternatives.
- **Chapter 4- Project Consultation and Coordination:** This chapter provides a list of the Federal, State, and local agencies consulted during the development of the EA.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Marlinton Ranger District of the Monongahela National Forest in Marlinton, WV.

CHAPTER 1- PURPOSE AND NEED FOR ACTION

INTRODUCTION

Administration of grazing permits and monitoring of grazing allotments by Monongahela National Forest personnel has indicated that, on the four selected grazing areas, changes could be made to livestock facilities and in the way livestock are being grazed, to improve the management and resource conditions of these areas.

The Forest Service has been managing these open areas as range allotments for many years. Recent projects within the allotments are pond restoration in Day Run and Kramer, brush (hawthorne and multi-flora rose) cutting with a chainsaw in Kramer, mowing in Day Run, Kramer and Beale-Hacking, and annual fence maintenance (adding barbed wire and replacing posts) on all four allotments. Collectively, all four allotments need repair to the exterior fence lines, control of noxious weeds and hawthorne, restoration of water sources, liming, and fertilization.

Area Descriptions

The Day Run allotment is located on a mostly level ridgetop at approximately 4000 feet in elevation. Locust Knob and Big Spruce Knob surround the allotment and the head of Day Run is just below the allotment. The allotment can be accessed from FR 999. The allotment is 120 acres and contains two pastures, with two ponds in each of the pastures. Three of the four ponds are being used by the livestock as a water source. The fourth pond is not holding water and needs to be relocated. There is a large amount of small-sized hawthorne (up to 24 inches) throughout the allotment and other non-native invasive species such as multi-flora rose.

The Kramer allotment is 18 acres and a gently to moderately sloping allotment with an elevation of approximately 3000 feet. It is located near Tilda Fork, which is a small stream that drains into Stamping Creek. It has two livestock watering developments; a pond and water tank that is fed by an enclosed spring box. This allotment contains a large amount of multi-flora rose.

The Beale-Hacking allotment is 86 acres at approximately 4,100 feet in elevation. It is a gently sloping to level allotment. It is located on top of Buzzard Ridge off of FR 1026. It contains three ponds and also a water tank that is fed by a fenced spring box. The three ponds need to be cleaned out, dams repaired, and a drainage pipe installed in each. This allotment also contains a large amount of hawthorne.

The Mullenax allotment is 43 acres in size, with the elevation ranging between 3,200 to 3,400 feet. It is located near Elk Mountain and is at the end of FR 832. Mullenax Run is a small stream that runs through the allotment. A large pond and the stream are used by the livestock as a water source. The allotment contains a substantial amount of hawthorne and multi-flora rose.

All grazing on the Monongahela National Forest is seasonal.

Forest Plan Direction

The Monongahela National Forest Land and Resource Management Plan (LRMP) provides the following direction for rage allotments (see Forest Standards and Guidelines in Appendix):

Desired condition

Grazing allotments are managed primarily for livestock grazing, wildlife habitat, visual diversity and dispersed recreation. A sustainable level of forage, consistent with other resource management direction, is available for use through the grazing permit system. Rangeland forage quality is maintained or improved in areas where vegetation management projects and range management actions occur. Riparian and upland areas within range allotments are functioning properly or have improving trends in vegetative composition, structure, and vigor. The composition and densities of tree, shrub, and herbaceous vegetation are variable and dynamic

Purpose & Need for Action

The Rescissions Act of 1995 mandates that the Forest Service (FS) have all grazing allotments in compliance with the National Environmental Protection Act of 1969 (NEPA) by 2010. The LRMP (see page II-44) directs the FS to maintain or improve existing range allotments by:

- managing grazing allotments to provide open areas for forage, wildlife habitat, visual diversity, and dispersed recreation,
- establishing grazing capacities based on the Adaptive Management strategies as outlined in Chapter 90 of FSH 2209.13,
- refining or implementing more appropriate grazing systems,
- applying lime and fertilizer where needed,
- seeding to improve vegetation quality, and/or
- selectively controlling undesirable vegetation, such as brush or non-native invasive species.

The individual needs that exist for the allotments are listed as follows:

- riparian issues in the Mullenax Allotment
- hawthorne and noxious weed control in all four allotments
- restoration and development of three ponds in Beale-Hacking and pond relocation in the Day Run allotment

In all four of the allotments, structural improvements (such as fences and livestock watering facilities), and non-structural improvements (such as re-seeding, the application of soil amendments such as lime and fertilizer, and brush control) have deteriorated over years of use, exposure to the elements, low intensity of maintenance and management, and invasion by weeds and brush. There is a need to make major repairs to, or to reconstruct some of these structural improvements. For example, good fences are needed to keep livestock in the allotment, to reduce impacts from grazing to sensitive areas such as riparian areas and wetlands, and to prevent trespass of livestock to adjacent National Forest and private lands. Water for livestock and wildlife to drink is essential. Ideally, livestock watering would take place from developed watering facilities such as water troughs or fenced ponds, as opposed to unfenced creeks, wetlands or springs. Soils on these areas and their resulting vegetation would benefit from reseeding and from the addition of soil amendments, such as lime and/or fertilizer.

Several species of desirable grasses and legumes have declined over time. The reseeding of pasture helps to maintain important forage species for use by wildlife, as well as by livestock. Liming of soils increases soil pH, or reduces soil acidity. This favors the growth of legumes and other beneficial vegetation. Increasing soil pH also increases the availability of existing soil nutrients for uptake by plants and indirectly acts to increase fertility of the limed area. Plants grow more vigorously and are more nutritious when growing in more fertile, near neutral (pH =7) soils. Legumes, such as clovers, are high in protein and are especially nutritious to wildlife and livestock for general health, growth, milk production for nursing young, and for healthier offspring. Weeds and woody vegetation have invaded these areas and require selective control. Weeds and brush compete with other more preferred vegetation for limited soil moisture, sunlight, and nutrients. They shade out herbaceous vegetation and spread to adjacent areas. Some of these weeds are poisonous, noxious, non-native, and/or invasive.

In addition, grazing allotments provide fuel breaks and reduces fuel loading in the areas. The reduction for fuel loading and fuel breaks give the Forest an advantage when controlling wildland fires.

The Proposed Action

Grazing would continue seasonally on the allotments. Day Run would continue to have a rotational grazing system. To protect and/or improve the grazing systems and associated resources on the allotments, the following activities are proposed:

- Continue to use livestock grazing as a vegetation management tool to assist in maintaining these areas in a relatively open, non-forested, herbaceous condition;
- Maintain/repair and/or reconstruct/replace all structural improvements, such as fences, corrals or watering facilities, as needed. Black locust within allotments may be cut to be used as fence posts.
- Use EPA registered and approved herbicides (glyphosate and triclopyr) according to label directions and supervised by a certified pesticide applicator to control hawthorne and noxious, non-native, invasive or poisonous brush and weeds. More than one application may be needed. Only individual basal spray treatments or spot applications would be made on an as needed basis.
- To improve soil productivity and vegetation types, apply lime and/or fertilizer to selected portions of these areas based on soil test results. Reseed grasses and legumes, usually through frost seeding.
- Mow, chainsaw lop or use hand tools as needed to selectively control weed and brush invasion.

Specific to each allotment, the proposals on **Beale-Hacking** includes cleaning out three ponds using an excavator and/or backhoe and installing pipe to an existing spring tank to deliver the water to the cattle. In **Day Run**, the proposal includes abandoning and relocating one of the ponds that is not holding water, and in **Mullenax**, installing fence around riparian areas to exclude cattle is proposed.

Decision Framework

Given the purpose and need, the deciding official, in this case, the Forest Supervisor, reviews the Proposed Action and the other alternatives in order to make the following decisions:

1. Whether to select the Proposed Action or one of the other alternatives.
2. Determine if the selected alternative complies with the Forest Plan, as amended?
3. Determine if the selected alternative protects threatened and endangered species and their habitat?
4. Determine if the selected alternative protects archeological and cultural resource sites?
5. Determine if the selected alternative avoids substantial adverse effects to other resources such as wilderness and wetlands?
6. Determine whether the selected alternative would have significant impacts on the quality of the human environment and an Environmental Impact Statement needs to be prepared, or whether no significant impacts are expected, and therefore, a "Finding of No Significant Impact" needs to be prepared.

If the Forest Service determines there are no significant impacts, the decision would be documented in a Decision Notice.

CHAPTER 2 – ALTERNATIVES CONSIDERED

Introduction

This chapter describes and compares the alternatives considered for the project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, discussing the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

Public Involvement

The project was listed in the Forest's Schedule of Proposed Actions (SOPA) in the June 2007 issue. The SOPA is available on the Monongahela National Forest (MNF) web site, and is mailed out to those who have requested to receive a hard copy of this document.

The Proposed Action was provided to the public and other organizations and agencies for review and comment during scoping, April 27 through May 1, 2007. A copy of the scoping notice was mailed to 88 individuals or organizations believed to have an interest in the proposed project. In addition, as part of the public involvement process, the agency posted the scoping notice on the MNF website under the planning section.

Issues

The Forest Service separates issues into two groups. 1) Substantial issues to be addressed in detail by developing an alternative to explore the concern, and 2) non-substantial issues that would not be addressed in detail because they were either outside the scope of the Proposed Action, already decided by law, regulation, Forest Plan, or other higher level decision, minor or irrelevant to the decision to be made, or conjectural and not supported by scientific or factual evidence.

The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…". A list of non-significant issues and reasons regarding their categorization as non-significant may be found in Appendix A.

Concerning significant issues, the Forest Service did not identify any issues raised during scoping that would drive the development of another alternative. However, the District Ranger determined the need for an action alternative that did not use herbicides to control non-native and noxious weeds. Alternative 3 does not include herbicides to control invasive woody vegetation and plants.

Other proposals considered from scoping

The responses to the scoping notice were from the current allotment permittees and the West Virginia Division of Natural Resources. The majority of the responses supported the proposed activities for the allotments. One permittee proposed installing a bridge or repairing the existing ford

to cross a stream running through the Mullenax grazing allotment. The permittee is not able to access approximately 8-10 acres to apply lime/fertilizer, mow the allotment with a farm tractor, etc. The installed bridge or repaired ford would allow the permittee to cross the stream, thus being able to manage better the 8-10 acres.

Alternatives Analyzed In Detail

There are maps in Appendix E of this document that display activities for each of the Action Alternatives. Use these maps when reading the narratives comparing Alternatives, below.

No Action

Under the No Action Alternative, livestock grazing would discontinue in the Day Run, Mullenax, Kramer, and Beale-Hacking grazing allotments. The normal maintenance/repair of existing facilities, such as fences, gates and corrals would not continue. No new facilities such as new interior fences to implement rotational grazing, or new watering facilities, would be constructed. The additions of lime and fertilizer would not occur. Since no fence repair and construction of new fence would take place, black locust trees would not be cut within any of the four allotments.

The fencing around the streams in the Mullenax Allotment would not be installed and the existing pond would not be maintained. The cleaning out of three ponds and the installation of pipe to an existing spring tank would not be implemented on the Beale-Hacking Allotment. In Day Run, the one pond would not be abandoned or relocated. No herbicide treatments would be applied in any of the alternatives.

Alternative 2 – The Proposed Action

For a detailed explanation of this alternative, see "The Proposed Action" section in Chapter 1 (also see the Appendix E for maps of the existing condition of the four grazing areas). Much of the work proposed in this alternative is maintenance of existing facilities. New work proposed includes such activities as fencing out riparian areas, applying soil amendments, seeding, providing additional watering facilities, and controlling noxious/non-native invasive weeds through use of EPA-approved herbicides (glyphosate or triclopyr).

This alternative is consistent with the Forest Plan. It moves the proposed project areas towards the desired future condition as directed in the Forest Plan and it would meet the purpose and need. It would also be consistent with State and local environmental protection laws, regulations and ordinances, and with Forest Service Handbook and Manual direction.

Alternative 3 – No Herbicide Use

This alternative addresses the issue/concern that an EPA approved herbicide would be selectively applied under the supervision of a certified pesticide applicator to non-native invasive/noxious weeds and/or brush within and closely adjacent to the four project areas. In this alternative all proposed work as stated in the Proposed Action would still be conducted except that no herbicides would be used on any of the four project areas. Only cutting of non-native, invasive/noxious weeds and brush through such techniques as tractor brush hogging/mowing, chainsaw lopping, cutting with hand tools or hand-pulling would occur.

This alternative is also consistent with the Forest Plan. In many respects it would move the proposed project areas towards the desired condition as directed in the Forest Plan. However, current

legislative and regulatory direction relating to noxious/non-native invasive weeds would not be met. Without the use of herbicide to control the existing noxious/non-native weeds in the project areas, there would be long term decreases in productivity of native and/or preferred vegetation, wildlife and wildlife habitat, and grazing lands/forage, and these weeds would continue to proliferate.

Alternatives Considered But Eliminated from Detailed Study

The use of prescribed fire was considered as a possible way to control noxious weeds/brush in the allotments. It was determined that this method would not be feasible. The project areas contain mostly cool season grasses. These grasses green up early in the spring and stay green through the first few hard frosts in the fall and are difficult to burn at any time of year. Also, since the areas are grazed, there are usually not sufficient quantities of fine fuels available to carry a fire. The fire needs to be hot enough to burn the base of such woody plants as multi-flora rose or autumn olive in order to kill the above-ground stems. As with cutting, even if the above-ground stems were killed by fire, they would sprout back since the fire would not affect the plants' root systems. In areas where noxious weeds grow in fence lines, the fires would need to burn through the areas containing fences to control these plants. This would burn up some of the wooden fence posts and affect the strength and protective coatings on the fence wires. To control noxious weeds growing in fence lines, fire lines to contain the burn would need to be constructed outside the allotment boundary fences. This is usually not desirable or possible since these areas are either wooded, private property, or close to creeks or riparian areas, which could lead to damage to these areas.

Mitigation Measures/Design Criteria

To reduce potential negative impacts or concerns of proposed work, the following mitigation measures have been developed. They would be applied to project implementation, as applicable.

1. Black locust trees needed for fence posts would be removed during the Indiana bat hibernation period from November 15 through March 31; trees with sloughing or loose bark, as well as snags would not be selected for removal as a protective measure for the Indiana bat. This mitigation measure would ensure suitable habitat for the Indiana bat would continue to exist in the project area. In addition, the Indiana bat hibernation period mitigation would ensure the Indiana bats are not mistakenly harmed.

2. For Alternative 2, the following mitigation measures would be used during herbicide applications:

a. The herbicide would not be applied aerially. Only low volume backpack sprayers or sprayers mounted on trucks, ATV's, or trailers would be used.
b. To reduce drift, spray equipment would be calibrated to emit a droplet size greater than 200 microns.
c. Herbicide application would be under the supervision of a certified applicator.
d. Areas treated would be signed to identify the material used and the date of application.
e. To help keep track of plants treated and to reduce the chance that the same target plant would be treated more than once, one half ounce or less of Bullseye blue spray pattern indicator/colorant would be added per gallon of spray mixture.
f. Spraying would not be done if winds exceed 10 mph, or if heavy rain is expected within 2 hours.
g. To reduce exposing the applicator(s) to spray contact, a step stool/ladder would be used to apply the herbicide to the tops of vegetation over 10 feet high.

h. All label directions would be followed.
i. Applicators would wear a long sleeved shirt and long pants (both required by the label). Other protective equipment not required to be worn by the label, but which would be required to be worn by Forest Service employee(s) or contractor(s) applying herbicide include: boots, a hard hat with a plastic liner, rubber or nitrile gloves, and safety goggles or a face shield. Clean clothing would be worn everyday. Upon coming home after work, applicators should shower and change clothes. Clean wash water, soap, and towels would be available for the crew. Eyewash bottles and a change of clothing would be available at the job site in the case of personal contamination. Applicators should wash their hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
j. The herbicide should not be mixed, stored, or applied with galvanized steel or unlined steel (except stainless steel) containers or spray tanks.
k. Project areas would be monitored the same growing season after initial treatment to determine how effective the treatment has been. The areas would also be monitored the following growing season after initial treatment to determine if a 2nd (follow up) treatment is necessary.

3. The Human Health and Ecological Risk Assessments for glyphosate and triclopyr are in the project file and located on the web at: **http://www.fs.fed.us/foresthealth/pesticide/risk.shtml**

The design criteria (Forest Standards and Guidelines) for this project are found in Appendix B.

Comparison of Alternatives

This section provides a summary of implementing each alternative. Information in Table 1 below focuses on activities. Table 2 is focused on effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 1. Summary of Activities by Alternative

Activity	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No Herbicide Use
Seasonal Grazing	NO	YES	YES
Maintaince of Structural Improvements	NO	YES	YES
Creation of New Watering Facilities	NO	YES	YES
Mowing of Weeds and Brush	NO	YES	YES
Application of Lime, Fertilizer and Seed	NO	YES	YES
Use of Herbicides to Control NNIS/weeds	NO	YES	NO

Fencing of Riparian Areas in Mullenax	NO	YES	NO

Table 2. Summary of Effects By Alternative			
Effect	**Alt. 1 No Action**	**Alt. 2 Proposed Action**	**Alt. 3 No Herbicide Use**
Reduce Nutrients and Sedimentation to Streams and Riparian Areas	YES	YES	YES
Protect Cultural Resources	YES	YES	YES
Reduce Compaction from Livestock to Riparian Areas	YES	YES	YES
Improve Herbaceous Vegetation through Seeding	NO	YES	YES
Improve Vegetation through Application of Soil Amendments	NO	YES	YES
Protect and Restore the Mullenax Riparian Area(s)	NO	YES	YES
Better Distribute Livestock Use	NO	YES	YES
Improvement of Habitat for Some Management Indicator Species	NO	YES	YES
Reduce Noxious Weeds Over the Long-term	NO	YES	NO
Adverse Effects to Threatened and Endangered Species	NO	NO	NO

CHAPTER 3 – AFFECTED ENVIRONMENT ANDENVIRONMENTAL CONSEQUENCES

Environmental Effects

This section summarizes the potential direct, indirect, and cumulative effects of implementing the various alternatives. The temporal boundary used for direct, indirect, and cumulative effects would generally be 10 years prior to implementation of the proposed activities, the present, and 10 years after the proposed activities are completed. The spatial boundaries for each of the resources would be the grazing allotments for direct and indirect effects analysis. The cumulative effects spatial boundary would be the land adjacent to the grazing allotments. These spatial and temporal boundaries would be used for effects analysis for all resources, unless defined otherwise.

Physical Environment

Soils

Existing Condition

Information for the soil resource is located in the County Soil Survey Report for Pocahontas County (1998). This survey is authored by USDA Natural Resource Conservation Service Soil Survey in cooperation with the USDA Forest Service, West Virginia University Agricultural Experiment Station and local county authorities. The county soil survey report provides a map of the soil types (map units) at a scale of 1:24,000, soil map unit descriptions, typical soil series descriptions for the county, and soil map unit interpretations for various land management activities and soil properties. It is accepted that for large-scale planning, soil characterization data for typical soil pedons from surrounding areas may be used to develop general analyses of soil chemistry and soil physical properties.

A digital layer depicting the sensitive soils is available in the GIS database. Soils rated as sensitive require mitigation measures beyond those in the Forest Plan that are routinely applied during project implementation. Sensitive soils are grouped in the following categories: soils that overlay geologies that are prone to mass wasting and/or slippage, slopes > 50%, prime farmland, hydric soils, floodplain soils, soils that form on limestone and karst topography, and soils that are moderately well-drained or wetter.

Listed below are the soil series designated as sensitive and found within the range allotments in this EA.

Cateache - The Cateache series consists of moderately deep well-drained soils with moderate permeability. These soils directly overlay the parent material from which they develop and are described as being “residual.” This soil series weathered mainly from red interbedded siltstone

and shale. Cateache soils are on steep and very steep side slopes of mountains and ridges and on gently sloping to moderately steep benches and ridgetops. Slope ranges from 3 to 80 percent. Permeability is moderate, the available water capacity is moderate, and runoff is medium to very rapid. In areas that have not been limed, Cateache soils are strongly acid to moderately acid. These soils are highly erosive and prone to mass movement and slippage. These soils have moderate shrink-swell potential and low shear strength. The depth to bedrock is 20 to 40 inches and may restrict root growth. The bedrock is soft and weathers relatively easily.

Shouns - The Shouns series consists of very deep, well-drained, moderately permeable soils on footslopes and in coves. These are colluvial soils formed from weathered sandstone, siltstone, and shale. Colluvial soils are soils that have moved down slope from the landscape position where they originally developed. The Shouns soil series primarily is located on the lower part of hillsides, benches, and foot slopes. Runoff is medium to very rapid, permeability is moderate, and available water capacity is moderate or high. In areas that have not been limed, reaction is strongly acid to moderately acid. These soils are highly erosive and prone to mass movement and slippage. These soils have moderate shrink-swell potential and low shear strength.

Mandy - The Mandy series consists of moderately deep, well-drained soils with moderate permeability. These soils formed in residuum weathered from interbedded siltstone, shale, and sandstone. They are on broad ridgetops and upper side slopes of mountains. The soil ranges from extremely acid through strongly acid throughout. The potential for surface runoff is low to very high. Permeability is moderate, runoff is very rapid, and available water capacity is very low to moderate. Potential productivity for trees is moderately high. Slope is a limitation for equipment use, and erosion on roads is a major management concern.

All of the allotments are underlain by the Mauch Chunk geologic formation, which is known to contribute to highly erosive soils. The Mullenax allotment is the only allotment where bare soil is known to exist.

Desired conditions

Soil protective cover, soil organic matter, and coarse woody material are at levels that maintain the natural infiltration capacity, moisture regime, and productivity of the soil. Soils also have adequate physical, biological, and chemical properties to support desired vegetation growth. Exposed mineral soil and soil compaction from human activity may be present but are dispersed and do not impair the productivity and fertility of the soil.

Wetlands and floodplains function as detention/retention storage areas for floodwaters, sources of organic matter, and habitat for aquatic and riparian species. Improving watershed conditions contribute to the de-listing of water quality limited water bodies to meet Clean Water Act requirements and state water quality management rules. Stream channel and bank stability is protected during management activities.

Streams are in dynamic equilibrium; that is, stream systems normally function within natural ranges of flow, sediment movement, temperature, and other variables that provide for healthy aquatic systems. The physical integrity of aquatic systems, stream banks, channel substrates and other habitat components are intact and stable. Where channel shape is modified (e.g., road

crossings), the modification preserves channel stability and function. Streamside vegetation contributes to the protection and maintenance of water quality, water quantity, nutrient inputs, and physical channel integrity to support channel function, aquatic biota, aquatic and wildlife habitat, floodplain function, aesthetic values and designated uses.

Environmental Effects

The spatial and temporal boundaries for the soils resource would use the general definition given at the beginning of this section. However, the spatial boundary for cumulative effects would not use the area adjacent to the grazing allotments, it would use the area within the grazing allotments.

No Action

In all four allotments, no term grazing permits would be issued and the areas would likely be taken over by invasive species and early successional vegetation (see Vegetation report). Soil processes would continue without the removal of plants and nutrients and concentrated additions of nutrients by cattle. Any areas formerly overgrazed and therefore susceptible to erosion would revegetate and then be more resistant to erosive forces.

Environmental Consequences Common to All Action Alternatives

The effects of livestock grazing on soils when best management practices are applied are minimal. The BMPs call for the use of management tools that involve for example 1) rotational grazing, 2) calculated stocking rates - animal units/acre based on forage production from a site, 3) soil testing of grazing areas to monitor soil fertility to help promote optimal forage production, and 4) seasonal grazing. The uses of these BMPs do much to prevent soil deterioration on grazing allotments. Soil deterioration may include compaction, erosion, depletion of soil nutrients via overgrazing of forage, and disruption of the hydrological properties of the soil preventing the establishment of wetlands in areas where they would potentially exist without the presence of livestock.

Soil testing of the grazing allotments would allow the correct amount of fertilizers and lime to be applied. Without this testing, there is a risk of over-applying nutrients, especially nitrogen. Over-application of nitrogen could lead to excess amounts entering nearby drainages, thereby negatively affecting water quality. Soil testing would also indicate the amount of lime needed (in tons per acre) to bring the soil pH to a level that nutrients in the soil and any nutrients being applied would be readily available for plant uptake. This ranges from 5.6 to 7.8, depending on plant species.

Seasonal grazing protects the soil from compaction and erosion caused by the presence of animals on the allotment during freeze-thaw. Frozen subsoil can act to create perched water tables in the soil profile and restrict subsurface flow of water and not allowing for free drainage. Soils become rutted, and ponding of water results, creating mud holes.

Pond maintenance would be performed over the course of the term grazing permits on all of the allotments. Bringing in equipment to perform this task shall be done when soils are not wet. Any areas of bare soil created by the equipment would be mulched and seeded according to Forest Plan standards and guides. Providing good water sources away from streams is important so that cattle do not compact riparian areas, thereby inhibiting their function.

Photo 1 below shows that soils formed in the Mauch Chunk geology are prone to erosion. The Mullenax Allotment has several small areas of bare soil, most likely due to cow paths on a side slope that began the erosion process on the hillside.

Photo 1. Bare soil in the Mullenax Allotment

Current numbers of cattle on each allotment have been determined by calculations and by adapting those numbers over time to fit site-specific resources. This adaptive management would continue so that desired conditions are met on each of the allotments.

Proposed Action

All Allotments
Herbicide effects are documented in the Regional Herbicide Application EA.

Mullenax
Fencing of the riparian corridors would be a beneficial indirect effect to the soil resource. By keeping cattle out of the streams, the soil would not be compacted by trampling. The hydrologic properties of the soil would return to normal over time, allowing water to move through the soil profile into open channels as the riparian areas naturally drain. This revegetated area would catch sediment generated by grazing on the allotment.

Alternative 3

The effects of Alternative 3 are the same as for the Proposed Action, with the exception of no herbicide application and no fencing of the riparian areas in Mullenax.

Continuing grazing on the Mullenax allotment without fencing the riparian areas would contribute to further compaction and hoof shear of the stream banks which directly affects sedimentation to the two streams within the allotment.

Conclusion

There would be no indirect, direct, or cumulative negative significant effects to the soil resource from the activities in the proposed action. Continued erosion is an issue in Mullenax for both action alternatives; though the areas are isolated and riparian fencing (Proposed Action) and reintroduction of riparian vegetation would ensure that sediment does not reach the streams in the allotment. In Alternative 3, the riparian area compaction and hoof shear on the unfenced stream is undesirable due to a lack of riparian vegetation and sedimentation.

The activities in the proposed action would enhance the soil resource and provide protection over the long-term use of these areas.

Wetlands, Riparian Areas, Fisheries

Introduction

The following is a description of the aquatic resources in four range allotments (Beale-Hacking, Day Run, Kramer and Mullenax) on the Marlinton Ranger District, and the potential direct, indirect and cumulative effects of the alternatives being considered for allotment management. For the purposes of this analysis, aquatic resources include streams, springs, seeps, riparian areas and associated watershed processes. Sources of information for the analysis include geographic information system (GIS) data on file at the Monongahela NF Supervisor's Office (SO); existing stream survey information on file at the SO; fish sampling data from the West Virginia Division of Natural Resources, 1941-2001, on file at the SO; Heritage Data base information on file at the SO; personal communications with other resource professionals; reports and literature; and field reconnaissance in June 2007.

Affected Environment

The four allotments addressed in this environmental analysis are all on the Marlinton Ranger District and distributed within three fifth level watersheds: Upper Elk River (05050007010)), Williams River (05050005020) and the Greenbrier River 1 (05050003040). The size of the allotments relative to the scale of the fifth level watersheds is minor (less than 0.1% of the watershed area), so the analysis would address site specific effects to streams within and adjacent to the allotments and potential downstream effects.

Beale-Hacking: The Beale-Hacking Allotment is 86 acres in size and located on Buzzard Ridge, at over 4,000 feet in elevation. The allotment is in the Upper Elk River fifth level watershed which is 154,240 acres in size. There are no fish-bearing streams within the allotment, but the Slatyfork, which supports fish, does head in a spring/seep area within the

allotment. The spring/seep and approximately 200 feet of headwater channel within the allotment are not fenced and minor grazing impacts are noticeable. The channel is small and well-armored with rock and woody debris so sediment settles out and is trapped, minimizing potential downstream impacts. There is also a small, intermittent channel in the southeast portion of the allotment. It is in a wooded area and does not appear to receive much grazing impact.

Sensitive species/Aquatic MIS

There are no aquatic species that are federally listed or on the Regional Forest Sensitive Species (RFSS) list that are known to occur within or immediately downstream of the allotment, and there are no reports of any occurring within the Upper Elk River watershed.

Native brook trout are identified in the Monongahela National Forest Land and Resource Management Plan as a management indicator species (MIS), with a management objective to maintain or improve their habitat. Brook trout prefer streams with cold, clean water, a 1:1 pool to riffle ratio and abundant cover (USFWS 1982). There are no native brook trout streams within the allotment, but fish sampling in the Slatyfork in 2006 found native brook trout and sculpin in good numbers approximately 2.5 miles downstream of the allotment (data on file at the Monongahela NF Supervisors Office). Potential downstream impacts on native brook trout would be considered in this analysis. The two primary concerns associated with grazing would be downstream effects to water temperature due to reduced riparian vegetation and sedimentation due to bank erosion and channel impacts. Stream temperature data and sediment samples collected in the Slatyfork in 2006 do not indicate any stream temperature or fine sediment problems downstream of the allotment (data on file at the Monongahela NF Supervisors Office).

Day Run: The Day Run Allotment is 120 acres in size and is located near Locust Knob at 4,000 feet elevation. The allotment is within the Williams River fifth level watershed which is 82,624 acres in size. There are no fish-bearing streams within the allotment, but it forms the headwaters of Day Run within the Upper Williams subwatershed. A perennial stream bisects the allotment and was fenced in 2001 to protect it from grazing impacts. There is also a spring/seep area that forms a channel in the northwest corner of the allotment that is not fenced and minor grazing impacts are noticeable.

Sensitive species/Aquatic MIS

There are no aquatic species that are federally listed or on the Regional Forest Sensitive Species (RFSS) list that are known to occur within or immediately downstream of the allotment, and none have been reported within Day Run. Five RFSS (Appalachia darter, candy darter, Kanawha minnow, New River shiner and Eastern hellbender) have been reported in the Williams River farther downstream, with the closest record being candy darter collected in 1976 at the FR 86 bridge (Chipps 1992). Candy darters have not been collected in the Upper Williams River since that time. At that point (FR 86 bridge), the drainage area is over 13,000 acres in size, so it is unlikely that the potential effects associated with the allotment management would be detectable and even less so as you move further downstream.

Fish sampling information is limited for Day Run, but records from 1988 show a number of native species, including brook trout (WVDNR fish sampling data 1941-2000, on file at the Monongahela NF Supervisor's Office). Day Run in all likelihood continues to support native

brook trout and potential downstream impacts on native brook trout would be considered in this analysis.

The greatest concern would be potential downstream effects on stream temperatures and sedimentation. There is no stream temperature available, but fish collected in Day Run are indicative of a cold water system, and cool water species may occur near the mouth where it joins the Williams River. Although the Day Run watershed has highly erosive soils, a sediment sample collected in 1999 did not indicate a problem with fine sediment (data on file at the Monongahela NF Supervisors Office).

Kramer: The Kramer Allotment is 18 acres in size and located at an elevation of 3,300 feet. The allotment is within the Greenbrier River 1 watershed which is 100,224 acres in size. No fish-bearing streams occur within the allotment, but it is bordered on the west by an unnamed tributary to Stamping Creek, and too the east by Tilda Fork, both of which are protected by fencing. There is a wooded filter strip, of variable width, between the allotment fence and the stream. This filter strip should reduce the chance that sediment or nutrients from the allotment would enter the stream.

There is also an approximately 150-feet long overflow channel located below the small stock tank in the southeast corner of the allotment. It is not fenced and minor grazing impacts are occurring. The allotment currently supports five head of horses and aquatic resource concerns are low for this allotment.

Sensitive Species/Aquatic MIS

There are no aquatic species that are federally listed or on the Regional Forest Sensitive Species (RFSS) list that are known to occur within or immediately downstream of the allotment. There is also no data available for Stamping Creek. Six RFSS (Appalachia darter, candy darter, Kanawha minnow, New River shiner, elktoe and green floater) have been reported in the Greenbrier River 1. Considering the watershed area that influences species inhabiting the main stem of the Greenbrier River below the confluence of Stamping Creek, the size and scale of management actions on the Kramer allotment are inconsequential and undetectable to these species.

No fish sampling was conducted specific to this assessment and no existing data indicates whether brook trout occur adjacent or downstream of the allotment. Stamping Creek and Tilda Fork are currently not identified on the current list of Tier 2.5 streams under the anti-degredation rule, nor were they on the original presumptive list which was more inclusive (West Virginia Department of Environmental Protection web site 2007). Under the anti-degradation rule, Tier 2.5 streams are those streams that support naturally reproducing trout populations, are identified as reference streams, or have a high biological rating that indicates high water quality.

Mullenax: The Mullenax Allotment is 43 acres in size and located at an elevation of 3,300 feet on the north slope of Elk Mountain. The allotment is within the Upper Elk River fifth level watershed and the headwaters of the Old Field Fork. Two fish-bearing streams bisect the allotment which are currently not fenced out and show substantial effects from grazing. Bank damage, reduced riparian vegetation and elevated levels of fine sediment are found along both streams (see Photos 2 and 3).

Photo 2. Bank erosion and fine sediment.

Photo 3. Reduced riparian vegetation.

Sensitive species/Aquatic MIS

There are no aquatic species that are federally listed or on the Regional Forest Sensitive Species (RFSS) list within or immediately downstream of the allotment, and none have ever been reported within the Upper Elk River watershed. There is no data indicating the presence of native brook trout within the streams in the allotment, but the potential exists. Blacknose dace, which are often found with brook trout, were observed during a field reconnaissance of the allotment in 2007, and brook trout have been collected in Crooked Fork, which is just north of the allotment. No data was available for Old Field Fork and it currently is not considered a Tier 2.5 stream.

For the purposes of this analysis, the streams within the allotment are considered to be potential brook trout habitat and the potential direct and indirect effects of allotment management activities would be addressed. The two primary concerns are the effects of reduced riparian vegetation and trampling along stream banks and channels.

Resource Impacts or Issues Addressed

No significant aquatic resource issues were raised during the public scoping period. However, aquatic resources are potentially affected by the proposed activities and the effects of implementation are addressed in this report.

Scope of the Analysis

The analysis addresses the potential direct, indirect and cumulative effects of the proposed allotment management activities. These include the effects of grazing, brushing, herbicide use, fencing, stock tank maintenance, liming and fertilizing. The spatial scale for potential direct and indirect effects is the area within the allotments. Given the size of the allotments and their general location on small, headwater streams, the potential effects of grazing are not anticipated to be detectable very far downstream. Therefore, the spatial scale for cumulative effects would consider an area slightly larger than the allotments. The temporal scale would be annually, as long as the allotments are used. Following cessation of grazing, a period of 5-10 years would be expected for hydrologic functions to return.

Methodology

Direct effects are caused by activities that have a direct impact on aquatic resources and occur at the time the project is implemented. In the case of grazing, this would occur when cattle have access to streams and riparian areas and includes impacts to riparian vegetation, nutrient input from animal

waste, and hoof damage to stream banks and channels. **Indirect** effects are effects that occur at a later time or location from where or when the project is implemented. Indirect effects can be caused by activities that change runoff patterns, erosion rates, water chemistry or riparian characteristics. An example is increased bank erosion during high flows due to reduced vegetation or hoof impacts.

Direct/Indirect Environmental Consequences by Alternative

No Action – All Allotments

Under the No Action alternative, the allotments would not be grazed. Grazing impacts to stream channels, riparian areas, springs and seeps within the allotments would cease. No direct or indirect effects associated with grazing and related activities (fencing, stock tanks, etc.) would occur. Banks along streams within allotments would stabilize as impacts from grazing are eliminated and riparian vegetation recovers. Existing erosion and sedimentation would also be reduced as vegetation recovers. Riparian areas in the Mullenax allotment would recover and stream shading would increase as brush and woody vegetation returns. This would cool water temperature and improve habitat conditions for brook trout. Improved riparian conditions would act as filters for sediment and nutrients that may move from adjacent uplands. Compaction, bank shearing, or puddling by livestock would not impact soils and over time the hydrologic properties of the soil in these areas would return to normal. This would allow water to move more naturally through the soil profile and into open channels or into the groundwater, as springs and seeps move back toward their natural function.

Cumulative Effects

Under the No Action alternative, no grazing would occur and range management activities would not be implemented. Indirect beneficial effects would occur as vegetation in the allotments recover and aquatic resources heal, but this would not result in any anticipated cumulative effects downstream.

Sensitive Species/Aquatic MIS

The No Action alternative would result in improved aquatic resource conditions within the allotments. Given the relatively small size of the allotments and their proximity to aquatic sensitive species which occur far downstream, the No Action alternative is not likely to have any affect, even beneficial effects, on sensitive aquatic species. The improved aquatic resource conditions would improve habitat conditions for native brook trout within the Mullenax allotment. Brook trout habitat conditions further downstream of the allotments would be maintained, or slight improvements might be realized for populations in close proximity to the allotments.

Alternative 2

Beale-Hacking: Under Alternative 2, the Proposed Action, grazing would continue in the allotment. Maintenance would occur on two stock tanks and a pipe to an existing spring tank would be installed to deliver water to the cattle. Hawthorne and noxious weeds would be controlled by brushing, mowing and herbicides. Lime and fertilizer would also be applied as needed.
Potential effects of the proposed action would be similar to the existing conditions. Direct impacts would continue to occur to the channels in the allotment and the spring/seep area. The effects appear to be minor and do not extend far downstream below the allotment. The level of effects may be reduced if the improvement of the stock tanks and spring box draw cattle from these areas.

Some soil disturbance would occur as stock tanks are cleaned. Erosion control measures such as silt fence or hay bails would be used as needed to minimize soil movement. Soils would be reseeded and mulched following completion of the work to minimize erosion and sedimentation. The potential exists at one stock tank for some sediment to move into the headwaters of the Slatyfork, but the location of the stock tank relative to the channel reduces the risk. A large spring/seep area below the stock tank should capture and hold any sediment that may move before it reaches the channel. As long as stream channels and spring/seeps are avoided and Forest Plan direction is followed (see Standards and Guidelines SW 14, 19, 56, 57, 58, RA 14, 15 and 20), minimal direct or indirect effects are anticipated with vegetation control and management including mowing, brushing, cutting of black locust, liming, fertilizing and herbicide use. Effects may occur if equipment needs to cross the small, headwater channel in the allotment, but these effects would be minor and short term and limited to the immediate area of the crossing.

The use of lime and fertilizer could result in minor benefits by improving vegetative conditions within the allotment, especially in areas with sparse ground cover. No direct or indirect effects to aquatic resources are anticipated by the use of herbicides using basal spray applications and following recommended application guidelines. To avoid any accidental spills within watercourses, no herbicides should be used within 50 feet of the two stream channels within the allotment.

Cumulative Effects

Impacts to aquatic resources in the Beale-Hacking allotment are relatively limited and have minimal downstream effects. Sediment movement downstream is limited by the size of the channel and channel structure such as rocks and large woody debris which trap and hold the sediment. No other management activities are occurring in the headwaters other than the allotment. Road 1026 crosses the headwater channel of the Slatyfork and likely contributes sediment to the system. Fish sampling lower in the Slatyfork collected good numbers of brook trout and mottled sculpin which would indicate that cumulative impacts are minor in the watershed and likely undetectable from the allotment.

Sensitive species/Aquatic MIS

Alternative 2 would result in maintenance of existing aquatic resource conditions in and downstream of the Beale-Hacking allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Day Run: Under Alternative 2, the Proposed Action, grazing would continue in the allotment. Maintenance would occur on two existing stock tanks and one stock tank which currently does not hold water would be abandoned and relocated. Hawthorne and noxious weeds would be controlled by brushing, mowing and herbicides. Lime and fertilizer would also be applied as needed. Potential effects of the proposed action would be similar to the existing conditions. Fencing protects the small stream that forms the headwaters of Day Run from grazing. Direct grazing impacts would continue to the spring/seep area that forms a channel in the northwest corner of the allotment. The effects appear to be minor and do not extend far downstream below the allotment. The level of effects may be reduced if the improvement of the stock tanks draws cattle from this sensitive area. The one changed condition would be the abandonment and relocation of an existing stock tank. This would result in an area of soil disturbance at the new pond site and restoration of the abandoned site. Erosion control measures such as silt fence or hay bails would be used as needed to minimize soil movement. Soils would be reseeded and mulched following completion of the work to minimize

erosion and sedimentation. The potential effects are relatively low considering the pond sites are over 200 feet from the perennial channel which is fenced.

As long as stream channels and spring/seeps are avoided and Forest Plan direction is followed (see Standards and Guidelines SW 14, 19, 56, 57, 58, RA 14, 15 and 20), minimal direct or indirect effects are anticipated with vegetation control and management including mowing, brushing, cutting of black locust, liming, fertilizing and herbicide use. Effects may occur if equipment needs to cross the small, headwater channel in the allotment, but these effects would be minor and short term and limited to the immediate area of the crossing.

In order to minimize potential impacts associated with liming and fertilizing, a minimum buffer of 25 feet would be used between the channels within the allotment and the application of lime and fertilizer (RA 15). The use of lime and fertilizer could result in minor benefits by improving vegetative conditions within the allotment, especially in areas with sparse ground cover.
No direct or indirect effects to aquatic resources are anticipated by the use of herbicides using basal spray applications and following recommended application guidelines for the herbicides. To avoid any accidental spills within watercourses, no herbicides should be used within 50 feet of the two stream channels within the allotment.

Cumulative Effects

Impacts to aquatic resources in the Day Run allotment are relatively limited and have minimal downstream effects. Potential downstream effects are reduced by riparian fencing and locating stock tanks away from sensitive areas. No other management activities are occurring in the allotment area and the headwaters of Day Run. Future management actions would likely be associated with the allotment and it is not anticipated to make an appreciable or detectable addition to cumulative effects within the Day Run drainage area.

Sensitive species/Aquatic MIS

Alternative 2 would result in maintenance of existing aquatic resource conditions in and downstream of the Day Run allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Kramer: Under Alternative 2, the Proposed Action, grazing would continue in the allotment. Hawthorne and noxious weeds would be controlled by brushing, mowing and herbicides. Lime and fertilizer would also be applied as needed. Potential effects of the proposed action would be similar to the existing conditions. Direct impacts would continue to occur to the small overflow channel in the allotment. The effects appear to be minor and do not extend far downstream below the allotment. There is a wooded filterstrip between the allotment boundary and the adjacent stream channels. This filter strip should reduce the chance that sediment or nutrients from the allotment would enter the streams.

As long as activities occur within the allotment minimal direct or indirect effects are anticipated with vegetation control and management including mowing, brushing, cutting of black locust, liming, fertilizing and herbicide use. The proximity of the allotment to the adjacent stream channels varies from a few feet to over 200 feet. In portions of the allotment where it comes within 50 feet of the channels, lime and fertilizer should not be used. No direct or indirect effects to aquatic resources are anticipated by the use of herbicides using basal spray applications and following recommended

application guidelines. To avoid any accidental spills within watercourses, no herbicides should be used within 50 feet of the two stream channels adjacent to the allotment.

Cumulative Effects

Impacts to aquatic resources in the Kramer allotment are relatively limited and have minimal downstream effects. Potential downstream effects are reduced by riparian fencing and the small size and limited use of the allotment. Current management actions are limited in the allotment area. A road runs along and fords the Tilda Fork to access the allotment and the lower reaches of the two streams are on private land. Future management actions would likely be associated with the allotment and it is not anticipated to make an appreciable or detectable addition to cumulative effects within the two drainage areas or downstream in Stamping Creek.

Sensitive species/Aquatic MIS

Alternative 2 would result in maintenance of existing aquatic resource conditions in and downstream of the Kramer allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Mullenax: Under Alternative 2, the Proposed Action, grazing would continue and fences would be constructed along both streams in the allotment to eliminate grazing impacts. Hawthorne and noxious weeds would be controlled by brushing, mowing and herbicides. Lime and fertilizer would also be applied as needed.

The proposed action would be beneficial to streams in the allotment by fencing and protecting riparian areas from cattle impacts. The effects of fencing would be to allow riparian vegetation to recover and eliminate direct effects to stream banks and channels due to trampling. The only direct effects would occur at water gaps in the fencing to allow cattle and equipment access from one pasture to another. These points can be hardened to minimize impacts to the banks and stream channels. The overall effect of fencing would be beneficial to riparian conditions, which in turn would improve bank stability, water quality, stream shading and fish habitat conditions as water quality improves and sediments are flushed from the system.

The spring/seep in the allotment would not be fenced off and grazing impacts would continue to occur. These effects appear to be minor and any sediment and nutrients are trapped by the stock tank downslope. The ephemeral channels within the allotment would also not be fenced off and minor grazing impacts would continue to occur, with the exception of where they join the perennial channels and would be within the area of riparian fencing.

As long as stream channels and spring/seeps are avoided and Forest Plan direction is followed (see Standards and Guidelines SW 14, 19, 56, 57, 58, RA 14, 15 and 20), minimal direct or indirect effects are anticipated with vegetation control and management including mowing, brushing, cutting of black locust, liming, fertilizing and herbicide use. Effects may occur if equipment needs to cross the streams in the allotment, but these effects would be minor and short term and limited to the immediate area of the crossing.

In order to minimize potential impacts associated with liming and fertilizing, a minimum buffer of 25 feet would be used between the channels within the allotment and the application of lime and fertilizer (RA 15). The use of lime and fertilizer could result in minor benefits by improving vegetative conditions within the allotment, especially in areas with sparse ground cover.

No direct or indirect effects to aquatic resources are anticipated by the use of herbicides using basal spray applications and following recommended application guidelines for the herbicides. To avoid any accidental spills within watercourses, no herbicides should be used within 50 feet of the two stream channels within the allotment.

Cumulative Effects

Impacts to aquatic resources in the Mullenax allotment would be reduced by implementing Alternative 2. Riparian fencing would protect the streams within the allotment and should reduce downstream movement of sediment and lower stream temperature. The cumulative effects of the alternative would be beneficial, but relatively limited in scope and offset by other activities in the area. Immediately downstream of the allotment is private lands which extends down the Old Field Fork. Highway 219 and the access road FR 832 also contribute to sedimentation in the headwaters of the Old Field Fork. The most benefit incurred by Alternative 2 would be relatively site specific to the channels within the allotment.

Sensitive Species/Aquatic MIS

Alternative 2 would result in an improvement of existing aquatic resource conditions in and downstream of the Mullenax allotment. The improvede conditions are not likely to affect any aquatic sensitive species downstream, but habitat conditions for any brook trout within and downstream of the allotment would be improved. If brook trout are currently not present within the allotment, improved habitat conditions would enhance their ability to expand their range and numbers.

Alternative 3

Alternative 3 is similar to the Proposed Action except herbicides would not be used and the streams in the Mullenax Allotment would not be fenced to exclude cattle. The following discussion of effects would tier to the discussions for Alternative 2 and only address the exceptions.

Beale-Hacking: Management activities would be similar to Alternative 2 except no herbicides would be used. This would not result in any direct or indirect effects to aquatic resources in the allotment, but would eliminate any potential risk of an accidental spill.

Cumulative Effects

Similar to the effects described for Alternative 2.

Sensitive Species/Aquatic MIS

Alternative 3 would result in maintenance of existing aquatic resource conditions in and downstream of the Beale-Hacking allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Day Run: Management activities would be similar to Alternative 2 except no herbicides would be used. This would not result in any direct or indirect effects to aquatic resources in the allotment, but would eliminate any potential risk of an accidental spill.

Cumulative Effects

Similar to the effects described for Alternative 2.

Sensitive species/Aquatic MIS
Alternative 3 would result in maintenance of existing aquatic resource conditions in and downstream of the Day Run allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Kramer: Management activities would be similar to Alternative 2 except no herbicides would be used. This would not result in any direct or indirect effects to aquatic resources in the allotment, but would eliminate any potential risk of an accidental spill.

Cumulative Effects
Similar to the effects described for Alternative 2.

Sensitive species/Aquatic MIS
Alternative 3 would result in maintenance of existing aquatic resource conditions in and downstream of the Kramer allotment. The conditions are not likely affecting any aquatic sensitive species or native brook trout populations downstream.

Mullenax: Under Alternative 3, grazing would continue and fences would not be constructed along either stream in the allotment. Hawthorne and noxious weeds would only be controlled by brushing and mowing. Herbicides would not be used. Lime and fertilizer would also be applied as needed.

Alternative 3 does not protect the aquatic resources within the allotment from the substantial grazing impacts that are occurring. Cattle would continue to have access to the perennial streams which reduces riparian vegetation and bank stability. Water quality would be affected by increased sedimentation, nutrient inputs from animal waste and elevated stream temperatures due to reduced stream shading. Current grazing effects would continue to impact fish habitat conditions and reduce stream productivity. The spring/seep in the allotment would also not be fenced off and grazing impacts would continue to occur. These effects appear to be minor and any sediment and nutrients that move downslope are captured by a stock tank. The ephemeral channels within the allotment would also not be fenced off and minor grazing impacts would continue to occur, contributing to elevated sediment conditions in the perennial streams.

As long as stream channels and spring/seeps are avoided and Forest Plan direction is followed (see Standards and Guidelines SW 14, 19, 56, 57, 58, RA 14, 15 and 20), minimal direct or indirect effects are anticipated with vegetation control and management including mowing, brushing, cutting of black locust, liming and fertilizing. Effects may occur if equipment needs to cross the streams in the allotment, but these effects would be minor and short term and limited to the immediate area of the crossing. Any crossings on perennial streams should be hardened to protect the stream banks and channels.

In order to minimize potential impacts associated with liming and fertilizing, a minimum buffer of 25 feet would be used between the channels within the allotment and the application of lime and fertilizer (RA 15). The use of lime and fertilizer could result in minor benefits by improving vegetative conditions within the allotment, especially in areas with sparse ground cover.
No herbicides would be used. This would not result in any direct or indirect effects to aquatic resources in the allotment, but would eliminate any potential risk of an accidental spill.

Cumulative Effects
Alternative 3 would not include riparian fencing and the current conditions would continue to contribute to downstream cumulative effects. These additions are relatively minor considering the size of the allotment and the activities occurring downstream.

Sensitive Species/Aquatic MIS
Alternative 3 would result in maintenance of the currently degraded aquatic resource conditions in the Mullenax allotment. The conditions are not likely affecting any aquatic sensitive species downstream, but habitat conditions for any brook trout within or downstream of the allotment are degraded and reduce the productive potential of the streams. If brook trout are currently not present within the allotment, current habitat conditions reduce their ability to expand their range and numbers.

Consistency with the Forest Plan
All alternatives would be implemented consistent with Forest Plan goals, objectives, standards, and guidelines.

Consistency with Laws, Regulations, and Handbooks
All alternatives would be implemented consistent with Forest Service laws, regulations, and handbooks regarding management of the soil resource.

Biological Environment

Vegetation

Direct and Indirect Effects

The grazing of livestock on all of these proposed project areas would remove a portion of the vegetative growth/leaf area of herbaceous vegetation that these areas annually produce. Livestock primarily graze on herbaceous vegetation such as grasses and forbs. Wildlife, such as deer, groundhogs and grasshoppers, also feed on and remove vegetation from these areas. Some wildlife species such as deer and rabbits browse rather than graze and consume more woody vegetation, and especially in the winter months. Through consumption of forage and trampling of vegetation livestock grazing changes the height and density of the herbaceous vegetation and creates more diverse cover types and densities. Seasonal grazing does not kill vegetation. A portion of the annual growth of selected/preferred vegetation is removed. Less preferred and non- preferred species of vegetation remain, or is grazed to a lesser degree. The removal of a portion of the top growth of selected vegetation by livestock and wildlife actually improves forage quality for livestock and wildlife as the plants re-grow new leaves in reaction to having been grazed. This new growth is more tender, nutritious and palatable than old senescent vegetation. Preferred forage species are mostly cool season grasses and legumes. These grow best in the spring and the fall when temperatures are lower and moisture is more abundant. Under seasonal grazing, these cool season plants have time in the spring, prior to the onset of grazing, and in the fall, after grazing is over, to grow and store energy in their root systems. This allows them to successfully recover and over winter from the removal of a portion of their leaf area during the grazing season.

The grazing of vegetation allows more sunlight to reach the soil surface and allows low growing plants such as clovers to obtain more light and grow better. Soil temperatures are warmer, increasing plant root growth and the abundance and activity of soil organisms. However, at the same time, soil moisture is lost at a higher rate due to increased evaporation from higher temperatures and more wind near ground level. Grazing aids in maintaining a diversity of plant species which, in turn, provides a more dependable wildlife food supply. Overall, clovers and other legumes are beneficial to both animals and to the soil. Legumes add nitrogen to the soil through nitrogen fixing bacteria in their root nodules. This nitrogen helps nearby plants grow better. Clovers and other legumes are preferred forages for livestock and for many species of wildlife. The flowers of clover plants feed bees, butterflies, and other insects. If the height and density of herbaceous vegetation is not controlled clovers and other low growing vegetation are shaded out and soon lost from the area. Reducing the height and density of the herbaceous vegetation through grazing has both positive and negative effects to wildlife species, depending on the wildlife species in question.

The proposed control of noxious and other brush on these areas through mechanical and/or the use of an herbicide would assist in keeping these areas in a primarily herbaceous/non-forested condition. In West Virginia, succession from non-forest to forest occurs quite rapidly. Non-forested areas are quickly invaded by woody vegetation from seeds from adjacent wooded areas and are converted to forestland. Grazing can slow woody encroachment to an area through eating and trampling of woody seedlings, by maintaining a thick sod cover on the area by removing some of the tall herbaceous vegetation, and by reducing shade to low growing plants. However, because livestock (primarily cows and horses, not goats or sheep) do not forage much on woody vegetation, grazing by itself cannot prevent forest succession or the encroachment of woody vegetation into a non-woody area.

To maintain an area in a non-forest condition, a combination of activities such as grazing, mechanical cutting, burning, or the application of herbicides must be used. Proposed brush and noxious weed control would be selective. These four grazing areas contain either individual large trees, clumps of trees, various types of riparian areas, woodlots, hawthorne thickets or savannahs, hillsides where woody vegetation would not be controlled, or trees in odd/rocky areas. Areas adjacent to the allotments are usually wooded as well.

Direct and Indirect Effects

The No Action (Alternative 1) would not allow any management of the vegetation in the grazing allotments; thus, allowing the vegetation to revert back to a wooded area and infested with non-native plants and noxious weeds. In the Proposed Action (Alternative 2), the selective control of noxious brush through mechanical cutting and the use of an herbicide would remove some woody vegetation that could be used as perches, nesting sites, or as forage by selected wildlife species, such as songbirds or deer, and over a longer time span. Since noxious weeds such as autumn olive, multi-flora rose, and thistle provide fruits or seeds used as food by selected wildlife species, proposed noxious brush control would reduce the availability of some food sources for selected wildlife species. Under No Herbicide Use (Alternative 3) Alternatives proposed mechanical brush control would also remove perches, nesting sites, forage and soft mast for selected wildlife species, but for a shorter time interval, because this vegetation would sprout back and re-grow after cutting. However, under any alternative, there would still be other species of native woody vegetation on these areas that would not be controlled for various uses by wildlife.

Cumulative Effects

The Monongahela National Forest presently contains 53 grazing areas (allotments or grazing special us permit areas) for a total of 7,326 acres. The average size of grazing areas is 141 acres with a range from 18 to 993 acres. These grazing areas are scattered over six counties. Many of these grazing areas contain woodland within their boundary fences. Due to the heavy shade from overhead trees there is little to no herbaceous vegetation under these wooded areas. These wooded areas within allotment boundary fences are not grazed to the degree that open, grassy areas are. However, selected portions of the edges of these wooded areas are usually used as shaded loafing areas by livestock. As funds are available, as fences need replacement, and as the environmental analysis are completed, the Forest continues to exclude wooded areas and riparian areas from its grazing areas.

The allowable stocking on each National Forest grazing area is continually assessed. If it is determined that overgrazing or other resource damage is occurring, stocking rates are revisited and adjusted. Other management actions, such as placing or moving mobile mineral feeders, developing new or better livestock watering facilities, changing from continuous grazing to rotational grazing, etc. are also used to minimize adverse effects to resources within grazing areas. In some instances grazing areas are under-grazed. This leads to faster invasion of the area by woody vegetation and loss of this important non-forest habitat type. In these instances an attempt is made to increase the stocking rate toward what the areas can safely support. The trend and philosophy of the Forest over the years has been to discontinue grazing on areas that are least suited for grazing and to do a better job of managing those grazing areas that are considered more suitable for grazing, while still providing grazing opportunities to the local public.

The counties that contain National Forest grazing areas also contain private lands. Although West Virginia is a heavily-wooded state some of this private land has been cleared to graze livestock. Many of these private grazing lands are in relatively flat valley bottoms that are usually suitable for grazing, and are often well-managed. Some are not as suitable for grazing or are not as well-managed. As people found that they could not make an adequate living on West Virginia hill farms, many left those areas that had been cleared for pasture and row crop farming and moved to the cities to earn a living. Many farms have been abandoned or are no longer being managed as pasture and/or cropland, and have been planted back to trees or are naturally reverting back to forestland. In recent times, it is very rare to see West Virginia woodland being cleared to provide new/additional pastureland. The MNF does not clear woodland to create new grazing lands. All MNF grazing areas were already non-forest/grazing land before they were acquired. Most impacts to private woodlands are from subdivision and construction of new homes and associated road building, roaming cats and dogs, noise, all terrain vehicle (atv) use, odors, fuel wood cutting, timber harvest, etc. New home development does not occur on National Forest lands. There is less farm/pasture land and more forestland in West Virginia now than in the first half of the 1900's. For example, records indicate that between 1956 and 1986 6140 acres of MNF grazing areas were abandoned. More recently, another 2181 acres of MNF grazing areas were discontinued.

The cumulative impact from livestock grazing of livestock on vegetation on both private and MNF lands is decreasing compared to the past. Overall, there is less exposed soil and less soil erosion, less sediment and nutrients entering creeks and streams, and less damage to stream banks from livestock trampling now, as compared to the past. As these grazing areas have been abandoned and have been reverting back to forestland, or have been planted to trees, more old field and young forest habitat has become available for selected species of wildlife that use such habitats. These areas are less

disturbed, both physically from livestock and their management, and by human activity. Not only has this increase in early successional forested habitat benefited some species of forest game animals, but many species of plants, such as blackberries, elderberries, and other species of mast producing shrubs have also benefited. Many species of neotropical migrant songbirds that use early seral habitats, and that have been declining in West Virginia and throughout the mid-Appalachians, have also benefited.

Wildlife Resources

Introduction

This report discusses how the Range Allotment alternatives may change terrestrial wildlife habitat, affect wildlife resources and Management Indicator Species (MIS). The Marlinton Range Allotments project would continue range management on the Beale-Hacking, Day Run, Kramer, and Mullenax allotments. The two action alternatives under consideration would involve continuation of grazing and various allotment maintenance and improvement activities. These activities include cutting of locust trees on-site for fence posts, brush and noxious weed control, and application of lime and fertilizer. Refer to the Chapters 1 and 2 Range Allotment Environmental Assessment and Biological Evaluation for descriptions of the project area, proposed action, and alternatives.

Scope of the Analysis

This analysis addresses effects to animal species that are federally listed as threatened or endangered, animal species that are listed as Management Indicator Species (MIS) on the Monongahela National Forest as well as Birds of Conservation Concern and RFFS sensitive animals. Threatened, endangered, and sensitive species are collectively referred to as TES species.

Spatial Boundary

The spatial boundary for direct and indirect effects on TES species consists of the boundaries of the range allotments. These boundaries contain all proposed project activities and are the boundaries within which all direct and indirect effects would occur. For cumulative effects, the spatial boundary of the analysis is composed of the sixth-level huc watershed boundaries that contain the allotments, with adjacent watersheds to the east added to fill in gaps. This boundary includes the terrestrial ecosystems within which the effects of the project would occur, but is small enough that any contributions of the project to cumulative effects should still be measurable.

Temporal Boundary

The temporal boundary for direct, indirect, and cumulative effects on TES species is 10 years from the beginning of project implementation. A review of the NEPA documentation is expected to occur after 10 years, at which time a determination would be made on whether the effects analysis needs to be updated or supplemented.

Methodology

Original determinations for the four grazing allotments projects were made based on review of the following: 1) species specific literature as cited: 2) internal agency information (e.g., ArcGIS information: and 3) field review. ArcGIS information is a compilation of wildlife survey and sightings collected over many years. Field site visits were conducted by a Wildlife Biologist and/or by Biological Technicians in the spring of 2007.

Terrestrial Management Indicator Species

Implementing regulations for the National Forest Management Act (NFMA) under which the 2006 Forest Plan was prepared require National Forests to select MIS to monitor the effects of Forest management activities on fish and wildlife populations and habitat (36 CFR 219.19). These regulations have since been superseded by new regulations that do not require MIS. However, because the Forest Plan was prepared under old regulations, it selected MIS to monitor effects of management on wildlife habitat and populations. The Forest Plan identifies three terrestrial animal species as management indicator species:

Cerulean warbler (*Dendroica caerulea*)
Wild turkey (*Maleagris gallopavo*)
West Virginia northern flying squirrel (Glaucomys sabrinus fuscus)

The Forest Plan also include brook trout on the MIS list. This species is discussed in the Aquatic Resources report. One of the terrestrial MIS, West Virginia northern flying squirrel, is federally listed as endangered. This species is discussed in the Threatened and Endangered Terrestrial Anima section. The remainder of the terrestrial MIS analysis would focus on cerulean warbler and wild turkey.

Affected Environment

General Habitat Requirements of MIS

The two terrestrial MIS discussed herein have certain unique habitat requirements, and each can be viewed as representing a particular combination of habitat elements. Cerulean warblers typically occur in mature to old mixed mesophytic and oak forests with tall, large diameter trees and a mostly closed canopy, but with some canopy gap and complex vertical structure. Cerulean warblers also are associated with large tracts with forest interior conditions (Hamel 2000 and references therein). Wild turkeys in the eastern U.S. are highly dependent on acorns, but they also require herbaceous openings for brood rearing and shrubby cover for nesting (Steffen et al. 2002, Ryan et al. 2004, Wunz and Pack 1992, Everett et al. 1985, Pack et al. 1980). Thus, turkeys represent forests with an oak component that have interspersed openings and regenerating stands.

Habitat in the four grazing allotments

Wildlife habitat in the four grazing allotments is dominated by open grassy habitat with areas of mixed upland hardwood areas interspersed along the margins and in the interior of the allotments. The tree species composition of the mixed hardwood forest types is diverse and variable, but typically includes such species as sugar maple (*Acer saccharum*), Yellow birch (*Betula allegheniensis*) and red oak (*Quercus rubus*).

Based on the habitat present in the four grazing allotments, it is possible that the wild turkey occurs in the allotments, however due to lack of old growth characteristics (e.g. large tree gaps and complex canopy layering) the cerulean warbler is not likely to be present.

Herbaceous openings of which most of the allotments are comprised of provide turkey brooding and bugging areas throughout the allotments. The oak component however, while it does provide some mast production it is probably not abundant enough to support high densities of this species.

Desired condition
Two of the allotments (Day Run and Kramer) are managed under Management Prescription 6.1, which emphasizes sustainable production of mast and other plant species that benefit wildlife while the Mullenax and Beale-Hacking allotments are managed under MP 3.0 and MP 4.1 respectively. MP 3.0 areas emphasize wildlife tolerant of disturbance, such as white-tailed deer, gray squirrel, ruffed grouse, and associated species and MP 4.1 areas emphasize recovery of threatened and endangered species associated with spruce and spruce-hardwood communities. Approximately 1-8% of all three MP areas are to be maintained in openings (Forest Plan, p III-7, III-12, and III-31).

On all four of the allotment areas, structural improvements (such as fences and livestock watering facilities), and non-structural improvements (such as re-seeding; the application of soil amendments, such as lime and fertilizer; and brush control) have deteriorated over years of use, exposure to the elements, low intensity of maintenance and management, and invasion by weeds and brush. There is a need to make major repairs, or to reconstruct, some of these structural improvements. For example, good fences are needed to contain livestock within the allotment, to reduce impacts from grazing to sensitive areas such as riparian areas and wetlands, and to prevent trespass of livestock to adjacent National Forest and private lands. Water for livestock and wildlife to drink is essential. Ideally, livestock watering would take place from developed watering facilities such as water troughs or fenced ponds, as opposed to unfenced creeks, wetlands or springs. Soils on these areas and the resulting vegetation would benefit from reseeding and from the addition of soil amendments/amendments, such as lime and/or fertilizer. Weeds and woody vegetation have invaded these areas and require selective control. Weeds and brush compete with other more preferred vegetation for limited soil moisture, sunlight, and nutrients. They shade out herbaceous vegetation and spread to adjacent areas. Some of these weeds are poisonous, noxious, non-native, and/or invasive.

Environmental Consequences

Management Indicator Species

Direct and Indirect Effects

Wild turkey – If any undiscovered occurrences of wild turkey exist on the allotments, both positive and negative effects could occur under the action alternatives. A certain amount of trampling and herbivory by livestock would benefit the species by allowing more sunlight to reach the soil surface, thus allowing low growing plants to grow better. Soil temperatures would be warmer, thus increasing plant growth and ultimately increasing insect growth favorable for turkey brooding rearing. However, excessive grazing and trampling without an opportunity for the plants to recover likely would be detrimental.

Broadcast application of herbicide could have both beneficial and detrimental effects on wild turkey. On one hand, the proposed control of certain noxious weeds such as autumn olive, hawthorne, and multi-flora rose that produce soft mast would reduce the amount available to the wild turkey. However, maintaining these areas in an open state is considered more beneficial over the long term. And control of noxious weeds can increase forage and hard and soft mast production from native species for use by wild turkey.

The effects of cutting locust trees could be positive if the trees surround any red oaks thereby releasing the oaks to grow in a more favorable environment allowing more mast to be produced for nesting turkeys.

Application of lime and fertilizer could have both beneficial and detrimental effects. Benefits would include an increase in nutrients available to various clovers and other beneficial herbaceous/grasses and forbs that wild turkey rear broods in. The detrimental effect would be an increase in available nutrients for plants that compete with those native grasses and forbs, including non-native invasive plants.

Cleaning of ponds and installing a spring tank on the Beale-Hacking allotment and relocation of the pond on the Day Run allotment would be beneficial to wild turkey. It would be a source of drinking water.

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the beneficial or adverse effects discussed above would occur under the No Action alternative. However, reversion of the range allotments to forest would occur rather quickly and ultimately reduce the number of wild turkey that prefer the open grassy habitat afforded by the grazing allotments. For all alternatives, the potential adverse effects described above are extremely unlikely to occur.

Cumulative Effects
Because the potential for direct effects is either discountable or nonexistent for the wild turkey under all alternatives, no alternative would contribute to cumulative effects on MIS terrestrial animals.

Birds of Conservation Concern

Resource Impacts Addressed
This section of the EA has been prepared in response to the President's Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds" of January 10, 2001. Pursuant to this Executive Order, the U.S. Fish and Wildlife Service developed a list of birds of conservation concern for the Appalachian Mountain Bird Conservation Region (USFWS 2002). This section addresses the impacts of the proposed action and alternatives on birds of conservation concern.

Affected Environment
The Monongahela National Forest and the State of West Virginia occur within the Appalachian Mountain Bird Conservation Region. Twenty-seven species of birds are listed as birds of conservation concern for the Appalachian Mountain Bird Conservation Region. To simplify a discussion of the effects of the alternatives, these species have been grouped by the type of habitat they use. A description of each of these species and its habitat is provided below.

Species using forested habitat
Kentucky Warbler – dense under story of mature, humid deciduous forest, wooded ravines, oak-pine or northern hardwood forest.

Louisiana Waterthrush – along streams flowing though heavily wooded valleys, deciduous forest, some hemlock, northern hardwoods.

Swainson's Warbler – dense under story under an older forest, rhododendron or mountain laurel thickets in woods, mostly found in the south and west part of the state.

Worm-eating Warbler – mature deciduous woodland that lacks dense ground cover, mature beech-maple or oak-pine forest.

Cerulean Warbler – mature forest, mixed mesophytic and oak forest below 600 meters in elevation, common in the west part of the state, sparse in the mountains.
Wood Thrush – mature or near mature deciduous forest, prefers dense shade on forest floor.

Acadian Flycatcher – mature mixed deciduous forest dissected by small streams and ravines; lower elevations; not in spruce, oak or pine forest; nests over water; more common in the west side of the state.

Yellow–bellied Sapsucker (breeding populations only) – upland black cherry forest, cut over mature hardwoods, spruce-hardwoods.

Whip-poor-would – mixed deciduous woods, upland oak-hickory forest, not in spruce, hardwood-pine or hardwood-hemlock, few in northern hardwoods, rare in dense forest. Potential habitat could occur.

Northern Saw-whet owl (breeding populations only) – spruce and mixed spruce-hardwoods, swampy areas in coniferous forest, high elevations.

Black-billed Cuckoo – northern hardwoods, cove hardwoods, oak-hickory forest.
Prothonotary Warbler – swamps (wooded wetlands) and large streams, not in the highlands.

Red-headed Woodpecker – open oak groves with little understory, groves of oaks and grazing lands, Ohio River valley and low elevations in the Allegheny Mountains.

Species using non-forested habitat (grassland or other permanent openings)
Upland Sandpiper – grass, old field habitat, grassy mountain tops and reclaimed surface mines, pastures, airports, golf courses.

Buff-breasted Sandpiper – short grass, not listed in the WV breeding bird atlas, accidental/hypothetical to WV. Nests in the arctic shores of Alaska and Canada. Winters in the pampas of Argentina. Migrates up the Mississippi Valley and to the west.

Short-eared Owl – extensive open grassland, meadows, prairies, plains, marshes, dunes, tundra, not listed in the WV breeding bird atlas.

Sedge Wren – wet grass and sedge meadows, nests near surface of water, needs wetlands, grassy marshes.
Henslow's Sparrow – grassy, weed filled fields, fields of broom sedge and weeds, early years of plant succession.

Species using young forest/brushy habitat
Olive-sided Flycatcher – in openings in northern spruce forests, such as bogs, old beaver ponds, burned over slash from lumber operations with scattered snags and trees for perches.

Bachman's Sparrow – brushy overgrown fields, abandoned pastures growing up in shrubs, often in erosion gullies in steep hill sides, much un-used habitat remains.

Bewick's Wren – dry open country in valleys east of the mountains, in small clearings in spruce at high elevations, brushy thickets, favors old farm buildings, old farmsteads, very local or extirpated.

Prairie Warbler – young pine forests and brushy scrub, young second growth hardwoods, overgrown pastures, Christmas tree plantations.

Golden-winged Warbler – low, brushy second growth forest and open woodland, especially powerline rights of way, higher elevations, not in spruce.

Species using both forest and non-forest habitat

Peregrine Falcon – nests in cliffs, bridges over water, or high rise buildings in urban areas. Feeds over fields, forest, or urban areas by catching birds during flight.

Species not applicable to the MNF

Red Crossbill (southern Appalachian populations only) – not applicable to WV or the MNF

Black-capped Chickadee (southern Blue Ridge populations only) – not applicable to WV or the MNF

Chuck-would's-widow – No nest records from the state, mostly found in western hills portion of the state. The MNF is outside the known breeding range of this species.

Of the 24 species of birds of conservation concern in the Appalachian Bird Conservation Region that are applicable to the MNF, 13 (54%) use primarily mature forest habitats. Permanent herbaceous openings and young forest/brushy habitat are each used by 5 species (21%). One species (4%) has very specific nest site requirements, but forages over a broad variety of habitats.

Scope of the Analysis

The area considered for direct, indirect, and cumulative effects to birds of conservation concern is the Kramer, Day Run, Beale-Hacking and Mullenax allotment project areas. Direct and indirect effects would be limited to the project area in the vicinity of management activities. The temporal boundary is approximately 10 years.

Methodology

Birds of conservation concern were grouped according to primary habitat usage based on information from the *West Virginia Breeding Bird Atlas* (Buckelew and Hall 1994). The atlas, breeding bird point count data from the project area, and habitat preferences were used to determine which species occur or could occur in the project area. Information on habitat preferences was used to assess the likely effects of management activities on the species in each habitat group.

Environmental Consequences Common to All Action Alternatives

Species Using Forested Habitat

Species using forested habitat are unlikely to be affected by either action alternative. They are not known to occur in the project areas due to the relatively small amount of available habitat.

Species Using Non-forested Habitat
Some individuals could be subject to direct mortality during mowing and cutting operations, particularly if it occurs during the nesting season (generally May through August for these species). The nature of such mortality would be similar in both action alternatives, but the magnitude could be greater in Alternative 2 due to the use of herbicide. Grassland habitat maintained through grazing and cutting/mowing operations would be beneficial because it would maintain the habitat that these species prefer.

Species Using Young Forest/Brushy Habitat
Some individuals could be subject to direct mortality during mowing and cutting operations, particularly if it occurs during the nesting season (generally May through August for these species). The nature of such mortality would be similar in both action alternatives, but the magnitude could be greater in Alternative 2 due to the use of herbicide.

Direct/Indirect Environmental Consequences

Alternative 1 – No Action
Under Alternative 1, grazing management would not occur, so Alternative 1 would have no direct effects on Birds of Conservation Concern. Indirectly, natural succession would continue, and the project area would trend toward older forest conditions. This trend generally would have no effects or beneficial effects on species that use forested habitats. Species using non-forest habitats would be affected, in the long term because the grassy openings would continue to revert toward a more mature seral stage. Habitat for species using young forest/brushy areas would decline as these areas mature.

Alternative 2 – Proposed Action

Species Using Forested Habitat: Effects are discussed previously under Environmental Consequences Common to All Action Alternatives

Species Using Non-forested Habitat: The removal of a portion of the top growth of selected vegetation by livestock and wildlife would improve forage quality for these species by allowing the plant to re-grow new leaves which is more tender and palatable than old senescent vegetation. Additionally this grazing would allow a more dependable wildlife food supply. Should any of the maintenance activities (e.g. mowing mechanical brush cutting) occur during the nesting season, any nests that are present in the allotments, along with any eggs or young would be destroyed. Adult birds are unlikely to be killed by these activities because the equipment is slow-moving and the birds are mobile enough to escape. Herbicide application could potentially remove some woody vegetation that could be used as perches, nesting sites, or as forage by selected wildlife species. Herbicides would also remove a potential source of wildlife food by removing the soft mast producing shrubs and bushes such as autumn olive and multi-flora rose. Under the No Action alternative and the No Herbicide use Alternative 3 proposed mechanical brush control would also remove perches, nesting sites, forage and soft mast for selected wildlife species, but for a shorter time interval, because this vegetation would sprout back and re-grow after cutting. However, under any alternative, there would still be other species of native woody vegetation on these areas that would not be controlled for various uses by birds found in this habitat. The addition of lime and fertilizer would be both beneficial and harmful to a variety of species. Beneficial effects to wildlife would involve the increased production of legumes and clover as well as woody vegetation that

would benefit birds in this habitat. Negative effects would include increased growth to non-native species that could out grow desirable native species and thus render potential habitat unsuitable. The rehabilitation and/or moving of several ponds within the allotments would increase drinking water to wildlife.

Species Using Young Forest/Brushy Habitat: Indirectly species using brushy habitat and young forest (mainly found along riparian corridors) would benefit by fencing out of the stream corridor in the Mullenax allotment. This action would deter trampling by cattle within that zone and would encourage growth of that habitat.

Alternative 3
Effects are discussed above under Environmental Consequences Common to All Action Alternatives.

Cumulative Impacts

Effects to Habitat
The proposed maintenance of the four proposed project areas in a non-forested condition can be beneficial to those species of birds of conservation concern that use either non-forested or young forest/brushy habitat. The proposed activities can be beneficial either through the use of livestock grazing and cutting/mowing of noxious weeds and brush or the use of herbicide to control noxious/non-native invasive species of weeds and brush. The habitat types these species use would be provided.

Effects to Individuals
The loss of nests, eggs and nestlings due to maintenance activities would be additive to such losses due to reasonably foreseeable timber harvest on adjacent private land if the activities on the allotments occur during the same nesting season. However, the contribution of the allotments to any cumulative effects is likely to be small given the ability of adult birds to move and re-nest within the same season.

Threatened and Endangered Terrestrial Fauna

Five federally-listed threatened and endangered animals are known to occur on the MNF. These species, along with their habitat preferences and potential to occur in the four allotments, are listed in Table 3.

Table 3. Federally-Listed Threatened and Endangered Terrestrial Animals on the Monongahela National Forest and Their Likelihood of Occurrence in the Area to be Affected by the management and improvements in the four grazing allotments.			
Species	**Federal Status**	**Habitat**	**Likelihood of Occurrence**
Indiana bat (*Myotis sodalis*)	Endangered	Hibernates in caves during winter. During other times of the year, forages in a wide variety of hardwood forest and woodland habitats. Outside the hibernation period, day roosts under exfoliating bark of dead or live trees.	Could occur. Primary range (land within five miles of hibernacula) occurs within the Kramer and Day Run allotments. Could roost or forage anywhere on the MNF.
West Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*)	Endangered	Inhabits spruce and spruce-hardwood-hemlock forests. Shelters in tree cavities and leaf nests.	Known to occur in the area of two allotments based on a capture records.
Bald Eagle (*Haliaeetus leucocephalus*)	Threatened	Mainly occurs near lakes and large rivers where it feeds on fish. Roosts and nests in large supercanopy trees near water bodies.	Occurrence in the four grazing allotments is unlikely, other than transient individuals
Virginia Big Eared Bat (*Corynorhinus townsend II virginianus*)	Endangered	Hibernates in caves during winter. Day roosts in caves or old buildings during other times of the years. Forages in a wide variety of forested and open habitats.	Unlikely to occur in project area. Nearest cave is approximately 16 miles to the northeast.
Cheat Mountain Salamander (*Plethodon nettingi*)	Threatened	Moist spruce and northern hardwood forests. Shelters under rocks and rotten logs.	Not likely to occur in project area, all grazing areas are mostly non-forested. The allotments receive direct sun, not moist enough.

Two of the five federally-listed terrestrial animals that occur on the MNF are either known to occur in the four allotments or could occur based on the presence of potential habitat. One species, the bald eagle, is considered unlikely to occur in the allotments, except for possible migrating or transient individuals passing through. The nearest known nest sites are approximately 16.5 miles away in the Paddy Knob area of Pocahontas County. No nearby roosting or feeding concentration areas are known. Therefore, the potential for occurrence in the project area is considered low. All alternatives would have no effect on the bald eagle and this species would not be analyzed further in this document.

Two other listed species, gray wolf (*Canis lupus* – endangered) and eastern cougar (*Puma concolor couguar* – endangered), formerly existed in the area, but are believed to have been extirpated in the late 1800s or early 1900s (WVDNR 1988, Stihler 2000). One listed species, the gray bat (*Myotis grisescens*), is known from one record from a winter hibernaculum survey in 1991. This record is considered accidental, and the species is not considered to occur in West Virginia (Stihler pers. comm. 2000). These three species would not be discussed further in this analysis.

Indiana bat

Affected Environment

General Habitat Requirements – Indiana bat distribution is generally associated with limestone karst (solution caves) in the eastern U.S. (Menzel et al. 2001). Indiana bats occupy distinct habitat types: caves and mines are used for hibernation during winter, while forested areas are used for summer foraging, roosting, and fall swarming.

Summer foraging and maternity roosting habitat is difficult to quantify at a range-wide, regional, or local level due to variability of known maternity roost sites and lack of knowledge about landscape scale habitat characteristics. However, Romme et al. (1995) described optimal roosting habitat as having 60 to 80 percent canopy cover, an abundance of large trees and snags (>8.7 inches DBH), and a relatively open understory. Tree structure, specifically the availability of exfoliating bark with roost space underneath, is a critical characteristic for roost trees. Timber cutting does not discourage Indiana bats from using dead trees nearby as roosts, and in fact may make them more attractive by allowing more warming by solar radiation (USFWS 1999). Indiana bats use isolated trees in openings as roost trees (Kurta et al. 1993), and they may switch between shaded and unshaded roost trees depending on weather conditions (Callahan et al. 1997; Kurta et al. 1996) and physiological requirements associated with thermal regulation. Indiana bat maternity colonies generally use both primary and alternate roost trees (Britzke et al. 2003). Loud noise from construction equipment has been known to disturb maternity colonies (Garner and Gardner 1992, cited in Evans et al. 1998).

Most known maternity sites have been located in forested tracts in the core of the Indiana bat's geographic range in Missouri, Iowa, Indiana and Illinois (USFWS 1999). However, maternity colonies recently have been reported in heavily forested mountainous areas of western North Carolina and eastern Tennessee (Britzke et al. 2003). Three confirmed lactating females have also been found in West Virginia, one of them within the MNF proclamation boundary but on private land (USDA Forest Service 2004). Colonies generally are found under the loose bark of dead or dying trees, but roosts have been found in tree cavities (Gardner et al. 1991).

While summer foraging habitat needs are not well understood (USFWS 1997), Indiana bats prefer to forage within upper forest canopy layers where overstory canopy cover ranges from 50 to 70 percent. Foraging habitat suitability declines slightly above and below this range (Romme et al. 1995). Menzel et al. (2001) suggested that foraging occurs in riparian areas, upland forests and woodlots, and over ponds. Indiana bats also are known to forage along forest edges, in early successional areas, and along strips of trees extending into more open habitat, but drinking water must be available near foraging areas (Romme et. al. 1995). Large open pastures or croplands, large areas with less than 10 percent canopy cover, and stands with large, unbroken expanses of young, even-aged forests are avoided or are rarely used (Romme et al. 1995).

Indiana bats begin pre-hibernation swarming near caves as early as August, and continue swarming through October or November, depending upon local weather conditions. Swarming entails congregating around hibernacula prior to hibernation and flying into and out of cave entrances from dusk to dawn (Kiser and Elliot 1996). This is a biologically important period because during this time, bats mate and replenish fat reserves prior to hibernating (USFWS 1983).

The population of this species in the core of its range appears to be continuing to decline despite protection efforts at all known major hibernacula. Causes of the decline are not known; however, researchers are focusing on impacts from surrounding land uses, pesticides, heavy metals, and genetic variability. In contrast, hibernacula monitoring in West Virginia shows that estimated populations have increased since the early 1980s. Most significant caves are gated or fenced, which has protected Indiana bat populations and likely has been responsible for their increases (Wallace 1999).

Human disturbance of hibernating bats and cave vandalism are two primary factors contributing to Indiana bat declines. Other causes may include natural disasters, habitat alteration, chemical contamination, and historic collecting and handling (USFWS 1999).

Habitat on the Monongahela National Forest and in allotment project area – Indiana bat habitat on the MNF is managed using four aspects of Indiana bat habitat that are considered most important for survival and reproduction: maternity sites, hibernacula, key areas, and primary range.

Hibernacula and 200-feet radii around entrances to occupied caves and are managed through Forest-wide direction. The GIS analysis determined that the Kramer and Day Run allotments are within five miles of the Tub Cave hibernacula and that the Kramer allotment is also within five miles of the Martha's Cave hibernacula. Tub cave is approximately three miles from Day Run and three miles from the Kramer allotment. Martha's Cave is approximately five miles from the Kramer allotment. The latest winter survey of 2003-2004 Martha's cave recorded 196 Indiana bats. A survey of Tub cave in 2000-2001 indicated that 20 Indiana bats were hibernating in the cave. Both allotments have several small-sized ponds located within their boundaries (one in Kramer and three in Day Run). Indiana bats most likely forage in upland forests, over riparian areas, and wetlands, so it is feasible that some Indiana bats (primarily males) could be flying or foraging over or around both allotments from these two hibernacula some time during the non-hibernation period.

Maternity sites are evidenced by lactating females or juveniles discovered prior to August 15. A maternity site is surrounded by a 2.5-mile radius buffer around the maternity roost site, or around the lactating female/juvenile discovery site if the roost trees cannot be located. Maternity site buffers are maintained for three years and are managed through Forest-wide direction. All four allotments do not contain any known maternity sites or any portion of the 2.5-mile buffer around the one known maternity colony within the MNF proclamation boundary.

The MNF conducts surveys for maternity colonies and summering males using mist net surveys designed according to the protocol outlined in the draft revised recovery plan (USFWS 1999). These surveys are conducted at several long-term monitoring sites that are frequented by summering Indiana bats, as well as in watersheds that are scheduled for upcoming timber management. Mist net surveys for Indian bats were not conducted in or around the Kramer or Day Run allotments because mist netting should not be conducted within five mile radius of an Indiana bat hibernacula. Based on studies their occurrence within that area is assumed. Mist net surveys were conducted in the Upper

Elk River watershed, approximately 1-3 miles northwest of the Beale-Hacking allotment in the summer of 2004 and in the Upper Elk River and Sitlington Creek watersheds, approximately 0.5-1.5 miles from the Mullenax allotment in the summer of 2004. No Indiana bats were caught there. Long-term mist net monitoring has been conducted in the lower Williams River watershed, approximately 6-8 miles west of the Beale-Hacking and Mullenax allotments. No Indiana bats were caught there.

Key areas are designated by the MNF to provide mature forest habitat near hibernacula. A key area is at least 150 acres in size, and, as appropriate, should include 20 acres of older growth forest and 130 acres of mature forest located as close to the cave as possible. Key areas are managed through Forest-wide direction. There are no designated key areas within any of the four allotments. The closest key area is associated with Tub Cave and is located approximately 1.2 miles to the northeast of the Kramer allotment.

Primary range, which includes summer foraging, roosting, and fall swarming areas, is defined as all areas within five miles of hibernacula. Primary range is managed through Forest-wide direction. Management of primary range focuses on providing a continuous supply of potential roost trees and maintaining or restoring canopy closure levels that are favorable for roosting and foraging habitat.

Primary range associated with Martha's Cave, and Tub Cave covers approximately 3,560 acres of Blackwater Canyon, or about 69 percent of the canyon (National Forest and other land ownerships combined). Primary range overlaps 2.6 miles of the proposed easement (Figure 3). National Forest land within the primary range supports a mixture of hardwood forest types, more than 90 percent of which is over 70 years old. This habitat has the potential to support summer foraging, roosting, and fall swarming, although due to lack of recent thinning or disturbance, canopy closure is above the 50 to 70 percent level that is optimal for foraging. The existing railroad grade provides a partial break in the canopy that may enhance the suitability of potential roosting and foraging habitat along the grade. Stand data are not available for primary range on private land in the canyon, but the age class distribution is likely to be similar to the distribution on National Forest land. Based on examination of aerial photographs, the tree species composition on the private land in the canyon is likely to be less favorable for Indiana bat foraging, roosting, and swarming due to a larger conifer component than on National Forest land. However, canopy closure levels on the private land may be more suitable for foraging, roosting, and swarming due to recent thinning or selection harvests that appear to have created a semi-open canopy in some places.

The GIS analysis determined that the Beale-Hacking and Mullenax allotments are not within five miles of any caves known to be occupied by Indiana bats. Therefore, there should be no adverse effects to Indiana bats form the proposed action from these two project areas.

Direct and Indirect Effects

Effects to Habitat – Habitat changes due to the action alternatives would involve primarily cutting locust trees for interior and exterior fence posts within each of the four allotments as well as clearing encroaching vegetation through mechanical means or through herbicide treatment. Clearing of locust trees for fence posts may require cutting of occasional mature trees that are growing within the allotments. This vegetation removal would enlarge the existing canopy opening within the forested areas of each allotment, which could improve roosting habitat by exposing more potential

roost trees to sunlight. Cutting of occasional mature trees within the allotments may remove some potential roost trees if snags or trees with sloughing bark are removed.

The proposed use of herbicide to control non-native, invasive, noxious weeds and brush within each of the four allotments should not have any significant adverse effects to Indiana bats. Indiana bats do not roost in weeds or in the shrubs, such as autumn olive or multi-flora rose, proposed for control with herbicide. If left un-controlled, monocultures of noxious, non-native invasive species are likely to develop and spread. This can be detrimental to the habitat of the Indiana bat because vegetation that produces insects for bat food would be made up of a greater percentage of foreign plant species and would be less diverse.

Known hibernacula and designated key areas do not exist in the four grazing allotments, so the action alternatives would not affect these aspects of Indiana bat habitat.

Effects to Individuals – Because cutting of trees greater than five inches diameter at breast height (dbh) would be limited to occasional fence post trees within each forested area of the allotments, killing or injuring roosting bats would be unlikely. The mitigation for allowing cutting of trees 5" dbh and greater only during the hibernation period would ensure bats would not be using trees for roosting or maternity.

Cumulative Effects

The major potential negative effect of the Marlinton Range Allotments project relative to Threatened and Endangered species is the potential for loss of roost for the Indiana bat. This effect would add to the effects of past activities that may have caused similar loss. Examples of such past activities include widespread timber harvest, and fires between the years 1880 and 1930, Forest service timber sales and road building in more recent years, historic strip mining on private land and what is now National Forest land, recent timber harvests and road building on private land, and residential development on private land.

Any effects of the Marlinton Range Allotments project also would be additive to the effects of future activities within the cumulative effects boundary. On National Forest land, the only proposed future activities within the cumulative effects boundary are outfitter guide permits and the Upper Williams Watershed Improvement project. The outfitter guide permits would involve hiking, hunting, fishing, mountain biking, canoeing, horseback riding, etc. All of these activities, especially horseback riding, would have no impacts on roost trees for the Indiana bat. The Upper Williams Watershed Improvement project includes road decommissioning, stream bank stabilization, and wildlife habitat improvement, all of which should not have a significant impact on roost trees. These two projects by themselves are not likely to lead to large-scale landscape losses of potential cavity trees. Rather, they are likely to lead to small, incremental, and possibly temporary increases in the amount of cavity tree loss. The Marlinton Range allotment could make a small contribution to the cumulative effects of these incremental increases.

The Upper Williams Vegetation Management project is an ongoing activity within the cumulative effects boundary that would continue for the next few years. This project involves approximately 190 acres of regeneration harvesting; 1,433 acres of thinning, 300 acres of beech bark disease treatments, and 35 miles of road reconstruction, improvement, storage, and decommissioning. These activities have the potential to remove potential roost trees for the Indiana bat. However, because the allotments are already altered ecosystems, continued range management is not likely to make a

measurable contribution to any cumulative cavity tree loss caused by the Upper Williams Vegetation Management project.

Negative effects related to cavity tree loss are also likely to occur due to continuing activities on private land, such as timber management, agriculture, road construction and maintenance, residential development, and a host of other activities. Specific, quantitative information for future activities on private land in the cumulative effects boundary is not available. However, based on the recent past and the current condition of much of the private land in the area, it is likely that these activities would continue the landscape-level ecosystem alteration due to potential cavity tree loss. In comparison, the activities proposed for the Marlinton Range Allotments are very small-scale and relatively benign and all potential cavity trees would be surveyed prior to removal. It is very unlikely that any of the alternatives would make a measurable contribution to the cumulative ecosystem alteration that is occurring due to activities on private land in the cumulative effects boundary.

Effects to Habitat – The direct and indirect habitat effects outlined above for the action alternatives would make a minor addition to the cumulative effects of similar habitat changes that would be caused by reasonably foreseeable future actions. Reasonable foreseeable actions that have the potential to affect Indiana bat habitat include continued maintenance of the allotments and the planned selection harvest of individual locust trees within the surrounding private land. The overall cumulative effects would include a beneficial increase in more open under-story characteristics from the removal of some mature locust tress which would favorable to Indiana bat foraging and roosting, and the detrimental removal of potential roost trees when mature trees are cut. However, because the action alternatives would affect such a small amount of habitat compared to the amount that is likely to be affected by timber management activities on private land in the surrounding landscape, the contribution of these cumulative effects would be very small.

Effects to Individuals - The action alternatives have the potential to make a small addition to cumulative loss of potential roost trees for the Indiana bat caused by reasonably foreseeable future actions in the four grazing allotments. The primary future action with the potential to disturb roosting Indiana bats is the planned timber management activities in the Upper Williams watershed. Because the action alternatives would affect such a small area compared to the area that is likely to be affected by timber management activities in the Upper Williams watershed, the contribution to these cumulative effects is likely to be minor. Although the planned timber management in the Upper Williams watershed has the potential to cause harm or mortality of roosting Indiana bats through cutting roost trees, the action alternatives would be very unlikely to contribute to these effects.

West Virginia Northern Flying Squirrel

Affected Environment

General Habitat Requirements - The West Virginia northern flying squirrel is a nocturnal species that inhabits disjunct “islands” of high-elevation forest in the central Appalachians of eastern West Virginia and western Virginia (Menzel et al. 2004). The West Virginia subspecies of the northern flying squirrel occurs in a very small range that appears to have been isolated by habitat changes since the last ice age (USFWS 2001).

Throughout their range, northern flying squirrels use both tree cavities and leaf nests (Menzel et al. 2004). The squirrels apparently subsist on lichens and fungi, but also eat seeds, buds, fruit, staminate cones, and insects (USFWS 2001). Fecal samples indicate the most common foods eaten were lichens, fungi (mostly underground/hypogeous), pollen, and insects (Stihler 1994b).

In the central Appalachians, northern flying squirrels commonly prefer conifer/hardwood ecotones or mosaics dominated by red spruce and fir with hemlock, beech, yellow birch, sugar or red maple, and black cherry associates. Northern flying squirrels have also been captured in northern hardwoods with a conifer understory (Stihler et al. 1995). Northern flying squirrels have been captured in stands of various ages, understories, densities, and species composition, but most have been in moist forests with some widely-spaced, mature trees, abundant standing and downed snags (USFWS 2001, WVDNR 1997), usually with some conifer (spruce, hemlock, fir) present (Stihler 1994c). These habitats seem well suited to the squirrel's gliding locomotion, cavity nest requirements, and reliance on wood-borne fungi and lichens for food (USFWS 2001).

Habitat on the Monongahela National Forest and in the four grazing allotments – The Monongahela National Forest is believed to contain most of the range-wide habitat for the West Virginia Northern Flying Squirrel (Stihler pers. comm. 1999). Suitable habitat is managed under Forest-wide direction that largely protects it from negative impacts. Suitable habitat is identified and mapped consistent with the Guidelines for Habitat Identification and Management found in the updated *Appalachian Northern Flying Squirrels Recovery Plan* (USFWS 2001). At the Forest-wide level, suitable habitat is identified and mapped based on the MNF's stand inventory forest type and plot data. A map of suitable habitat is collaboratively produced between the MNF, USFWS, and WVDNR. The map is reviewed and refined at the project level based on aerial or satellite imagery supplemented with field reconnaissance. All capture locations are included in suitable habitat. All mapped suitable habitat is assumed to be occupied by WVNFS, and emphasis is placed on protecting this habitat.

West Virginia Northern Flying squirrels have been captured at two locations in the Day Run allotment (USDA Forest Service unpublished data). All of the captures have been on Forest Service land just north of the allotment boundary.

Suitable habitat has been identified and mapped on National Forest land along the northern boundary of the Day Run allotment and on the southern boundary of the Mullenax allotment. Approximately 14 acres of mapped suitable habitat on National Forest land extends into the Mullenax allotment and approximately 42 acres of suitable habitat extend into the Day Run allotment Suitable habitat typically is not mapped on private land, so there is no estimate of the amount of suitable habitat on the private land surrounding the four allotments. However, based on capture records and inspection of aerial photographs, some of the private land to the south of Day Run, and east southeast of Kramer and Mullenax appears to be suitable habitat.

Effects to Habitat – Habitat changes due to the action alternatives would involve primarily cutting locust trees for interior and exterior fence posts within each of the four allotments as well as clearing encroaching vegetation through mechanical means or through herbicide treatment. Clearing of locust trees for fence posts may require cutting of occasional mature trees that are growing within the allotments. This vegetation removal would enlarge the existing canopy within the forested areas of each allotment, which could improve habitat conditions for the West Virginia Northern Flying

Squirrel. Cutting of occasional mature trees within the allotments may remove some potential roost trees if snags or trees with cavities are removed.

The proposed use of herbicide to control non-native, invasive, noxious weeds and brush within each of the four allotments should not have any significant adverse effects to flying squirrel. The herbicide would be applied strictly within the grazing allotments and not to areas adjacent to the allotments. The flying squirrel is not within the allotments. The habitat for this species is outside the allotments in the wooded areas.

Effects to Individuals – Because cutting of trees greater that five inches dbh would be limited to occasional fence post trees within each forested area of the allotments, killing or injuring flying squirrels would be unlikely, but could occur if any are roosting or nesting in the trees to be removed. Furthermore, if any potential nest trees (trees greater than five inches dbh and trees less than five inches dbh with a cavity) need to be removed for fence post material, they would be removed only between September 15 and April 1, when both adults and young West Virginia Northern Flying Squirrels are expected to be capable of avoiding these activities.

If any West Virginia Northern Flying Squirrels are denning adjacent to the range allotments during maintenance activities, noise from mowers and chainsaw could cause them to flee from their cavities or nests. However, given the small area of habitat to be affected and the low quality of habitat along the edges of the allotment, the number of squirrels disturbed is likely to be very low. Should any squirrels be disturbed, the chances of them being struck by this equipment are considered negligible due to the normally low speed of these vehicles.

Cumulative Effects

Effects to Habitat – The direct and indirect effects of Action Alternatives 1 and 2 on West Virginia Northern Flying Squirrel are expected to be negligible, any contribution to the cumulative effects of other actions on habitat are not expected to be measurable.

Effects to Individuals – Reasonably foreseeable future logging activities on private land surrounding the four allotments may disturb denning West Virginia Northern Flying Squirrels. The upgrade and maintenance activities included in the action alternatives may make a small contribution to the cumulative amount of disturbance in the allotments. However, because of the low number of squirrels expected to be disturbed by the action alternatives, any contribution to cumulative disturbance is not likely to be measurable.

Regional Forester's Sensitive Species

The NFMA implementing regulations under which the Forest Plan was prepared require National Forests to maintain viable populations of species that occur on a National Forest (36 CFR 219.19, USDA Department Regulation 9500-4). As part of the strategy to address NFMA viability requirements and avert the need for listing under the Endangered Species Act (ESA), each region of the Forest Service has developed a list of RFSS, which are species for which population viability may be a concern. Direction in the Region 9 supplement to the Forest Service manual emphasizes maintaining viability for RFSS and ensuring that management activities do not result in trends toward federal listing (FSM 2670.22, 2670.32). Manual direction requires Forests to determine

whether their actions affect RFSS, and if so, whether those actions would result in a loss of viability or a trend toward federal listing (FSM 2670.32).

This analysis addresses terrestrial animals that are listed as RFSS on the MNF, including insects and other invertebrates. Aquatic species are addressed in the Water and Aquatic resources section.

Fifty three terrestrial animals are listed as RFSS on the MNF. To focus this analysis on those RFSS with the potential to be affected by the project, a Likelihood of Occurrence table was prepared to summarize the habitat requirements and known occurrences of RFSS and determine the likelihood that the species or potential habitat could occur in the area to be affected by the project. The Likelihood of Occurrence table is included in the project record; only those terrestrial RFSS with the potential to occur in areas to be affected by the project are discussed here. Because of the large number of RFSS, species are grouped according to important habitat characteristics.

Desired condition
Forest Plan desired conditions for wildlife include maintenance of viable populations of native and desired non-native wildlife. For RFSS, the desired condition is to avoid contributing to a trend toward federal listing.

Mature Forest Species

Affected Environment
Three RFSS animal, the northern goshawk (*Acciptier gentilis*), Noctuid moth (*Hadena ectypa*), and green salamander (*Aneides aeneus*) all have the potential to be affected by the project. Table 4 presents habitat preferences and limiting factors for the mature forest RFSS that could be affected by the project.

Table 4. Mature Forest Terrestrial Animal RFSS That Could Occur in the Area to be Affected by the four grazing allotment management project.

Species	Potential for Occurrence	Key Habitat Features	Limiting Factors
Northern goshawk (*Accipiter gentilis*)	Nearest known nest location is about 4-5 miles west of the Day Run allotment. Foraging habitat could occur along edges and within the allotment.	Large areas of mature, remote forest (6,000 – 27,000 acres for a breeding pair, Williamson et al. 2001)	Nest site disturbance, alteration of forested habitat.
Green Salamander *(Aneides aeneus)*	Known form one site 2.5 miles to the west of the Kramer allotment. Could occur in association with rocky areas anywhere on the west side of the allotment.	Crevices in rock outcrops, cliffs, and bark of old-growth trees (Nature Serve 2006, Wison 2001).	Tree canopy removal

Table 4. Mature Forest Terrestrial Animal RFSS That Could Occur in the Area to be Affected by the four grazing allotment management project.			
Species	**Potential for Occurrence**	**Key Habitat Features**	**Limiting Factors**
A Noctuid moth (*Hadena ectypa)*	Known to occur near the town of Marlinton. Due to very general habitat description, potential occurrence cannot be ruled out.	Northern hardwoods with high concentrations of starry campion (*Silene stellata*) (WVNHP unpublished information).	Insecticides, lack of larval food plant.

Habitat in the four grazing allotments
Wildlife habitat in the four grazing allotments is dominated by open grassy habitat with areas of mixed upland hardwood areas interspersed along the margins and in the interior of the allotments. The tree species composition of the mixed hardwood forest types is diverse and variable, but typically includes such species as sugar maple (*Acer saccharum*), Yellow birch (*Betula allegheniensis*) and red oak (*Quercus rubus*).

Based on the habitat present in the four grazing allotments, it is possible that all three species occur in the allotments especially in the hardwood zones along the perimeter of the allotments.

A GIS analysis of the known locations of past goshawk nest sites from in and around the MNF in relation to the four proposed project areas was conducted. This analysis revealed that the closest known goshawk nest site to any of the proposed project areas was 4.4 miles. However this raptor species is very mobile and can have a large home range. Nest sites can move from year to year and not every nest site is known. The forested habitat along the edges of the allotments runs through bedrock that may serve as potential habitat for the green salamander in places where undergrowth shades the rocks and keeps them moist. The potential presence of the larval food plant of the Noctuid moth (starry campion) has not been assessed.

Direct and Indirect Effects

Effects to habitat -
Essentially, the only proposed action that would take place within the edges of the allotment and where mature trees are found is the cutting of locust trees for fence posts. This activity could potentially affect the understory microclimate by producing open areas in the canopy layer thus allowing more light to reach the ground and increasing herbaceous plant growth at that level.

The cutting of locust trees would affect the three forested habitat RFSS in different ways. By increasing the growth of herbaceous species at the ground level, the activity could increase the suitability of larval habitat for the Noctuid moth. Removal of the canopy could also remove the vegetation that shades the exposed bedrock thus making the outcrops less suitable as green salamander habitat. Effects on potential goshawk habitat are more difficult to predict, though the increase in herbaceous and shrubby vegetation could increase the diversity of the prey base by providing more cover and food for small mammals and birds.

Effects to Individuals - The maintenance of the grazing allotments could kill or injure green salamanders or Noctuid moths that are present within the forested areas at the time the activities take place. Noctuid moths are more mobile that green salamanders and thus are more likely to be displaced rather than killed or injured. The three species are not known to be particularly sensitive to nearby human activity, so individuals that are near the maintenance activities may not be disturbed.

Goshawks have keen senses and are highly mobile, thus they are likely to flee the area in response to cutting of locust trees during this activity. Therefore, it is very unlikely that any goshawks would be directly harmed or killed. The noise and visual disturbance likely would be intolerable to goshawks for some distance. Due to the relatively small areas in suitable habitat, it is unlikely that any goshawks would be affected.

Cumulative effects

Effects to Habitat – The removal of some of the canopy layer within the forested areas of the allotments could cause an increase in the herbaceous and shrubby vegetation from the current cumulative amount of potential larval habitat for the Noctuid moth and prey base diversity for goshawks. However, much more of this habitat is available outside of the allotments and within private habitat. Because additional thinning and selection harvests are planned within the Upper Williams watershed and within private land in the foreseeable future, a net cumulative increase in this habitat is likely.

Loss of potential green salamander habitat on outcrops within the allotments would contribute to a cumulative loss of habitat within the allotments. However, due to the lack of information on the amount of habitat present in the allotments and the potential for future timber management on private land to affect habitat, the magnitude of the cumulative loss of habitat cannot be assessed.

Effects to individuals - Any harm or mortality of Noctuid moths or green salamanders caused by the maintenance activities would be additive to any harm and mortality caused by reasonably foreseeable actions within the Upper Williams watershed area as well as within the adjacent private lands. The primary reasonably foreseeable action with the potential to harm individuals of these species would be the planned timber harvest in the Upper Williams watershed area. Thus, maintenance activities within the allotments could cause a cumulative increase in harm or mortality of these two species. However, the magnitude of cumulative harm and mortality cannot be predicted due to lack of information on population levels in the allotments, lack of information on the amount and location of potential habitat on private land, and lack of information on the extent of future timber management activity on adjacent private lands.

Disturbance to goshawks due to maintenance activities could cause an increase in cumulative disturbance in the allotments. If maintenance activities occur during the same breeding season as maintenance activities in the allotments and at the same time as timber management activities within the Upper Williams project area, the cumulative disturbance could preclude goshawk breeding in the allotment areas for that season.

Overall the effects of the Action Alternatives on mature habitats and populations due to maintenance activities would be extremely negligible. Mature community viability would be maintained and no adverse effects on sensitive species would be expected. The action alternatives may impact

individuals but are not likely to cause a trend toward federal listing or a loss of viability for the sensitive species inhabiting mature habitat.

Species Associated with Open Habitats

Affected Environment
Two terrestrial animal RFSS associated with open habitats could occur within the boundaries of the four allotments. The Vesper sparrow (*Pooecetes gramineus*) and the Henslow's sparrow (*Ammodramus henslowii)* are not known to occur in the grazing allotments. The Vesper sparrow is associated with large areas of tall grass habitat and the Henslow's sparrow is associated with grasslands greater than 30 acres in size. Potential habitat occurs in two of the allotments. The potential for affecting open habitat RFSS species is low because surveys did not find any of these species in the allotments. However, if undiscovered populations exist, the action alternatives could have the following effects.

Direct and Indirect Effects

Effects to habitat – Trampling and herbivory by livestock and mowing for weed control could adversely affect any of the open species RFSS if disturbance is frequent and heavy. Intermittent disturbance by livestock and mowing would keep the areas open and could benefit the species that nest and forage in grassy open habitat. Rotational grazing as occurs within the Day Run allotment would allow some of the grass/herbaceous vegetation to rebound and increase growth providing more structural diversity within those habitat patches that these species prefer. Cutting of black locusts would not be implemented in the open grassy areas that constitute potential habitat for these species. Broadcast herbicide application under Alternative 2 would target non-native invasive plants such as autumn olive and multi-flora rose and would be applied with a backpack sprayer lessening the chances of killing non-target species used as food for both sparrow species. Lime and fertilizer application could have positive effects on open grassy habitat plant by providing nutrients for growth. Negative effects would be seen from increased growth rates for non-native species that could out-compete native grasses and forbs. The cleaning of ponds on the Beale-Hacking and relocation of the pond on Day Run would provide drinking water for the species associated with open grassy habitat. Fencing out of the riparian areas within the Mullenax allotment could increase brushy habitat now being trampled by livestock which in turn could provide better edge habitat.

Effects to Individuals – The maintenance activities could kill or injure any Vesper or Henslow's sparrows that are present within the allotments at the time the activities take place. Both species are highly mobile and are thus more likely to be displaced that killed or injured. However, if these species are nesting, the chances of destroying nests or eggs are likely.

Cumulative Effects

Effects to habitat – The removal of grass/herbaceous vegetation within the allotments could cause a small reduction from the current cumulative amount of potential nesting and foraging habitat for the Vesper and Henslow's sparrows however, this reduction would be short term and the area would revert back to potential habitat after the grazing has occurred particularly in the Day Run allotment due to the rotational grazing system.

Effects to Individuals - Any harm or mortality of adults, eggs or nestlings of Vesper or Henslow's sparrows caused by the maintenance activities would be additive to any harm and mortality casqued by reasonably foreseeable future actions in the surrounding area. The primary reasonable foreseeable action with the potential to harm individuals of these species would be the planned timber management activities in the Upper Williams watershed area. Thus, maintenance activities could cause a cumulative increase in harm or mortality of these two species. However, the magnitude of cumulative harm and mortality cannot be predicted due to lack of information on population levels in the allotments, lack of information on the amount and location of potential habitat on private land, and lack of information on the extent of future timber management activity on adjacent private lands.

Overall the effects of the Action Alternatives on open grassy habitats and populations due to maintenance activities would be extremely negligible. Open grassy habitat community viability would be maintained and no adverse effects on sensitive species would be expected. The action alternatives may impact individuals but are not likely to cause a trend toward federal listing or a loss of viability for the sensitive species inhabiting open grassy habitat.

Riparian/Stream Species

Affected Environment

Two terrestrial animal RFSS associated with riparian areas and stream habitats could occur within the boundaries of the four allotments. The eastern small footed bat (*Myotis leibii*) and the southern water shrew (*Sorex palustris punctulatus)* are not known to occur in the grazing allotments. The southern water shrew occurs in high elevation, cool, moist, shaded locations, usually not far from permanent water (Nature Serve 2006). It prefers heavy vegetative cover and plentiful logs, rocks, crevices, or other sources of shelter that offer high humidity and overhead protection (Wilson and Ruff 1999). This species has been recorded one mile from the Day Run allotment and could occur within the riparian zones of small streams located in the Mullenax allotment.

Eastern small-footed bats occur from Maine, Quebec, and Ontario southwestward through the Appalachian region to Arkansas and eastern Oklahoma. Eastern small-footed bats may hibernate close to summer roosting and maternity habitat (Whitaker and Hamilton 1999). Very little is known about their summer ecology. During this time, these bats are sometimes found in unusual roost sites such as under rocks on exposed ridges, in cracks in rock faces and outcrops, in bridge expansion joints, abandoned mines, buildings, and behind loose bark (Erdle and Hobson 2001).

Eastern small-footed bats forage over land and bodies of water (Wilson and Ruff 1999). Their diet includes flies and mosquitoes, true bugs, beetles, bees, wasps, ants and other insects (Harvey et al. 1999). They forage in and along wooded areas at and below canopy height, over streams and ponds and along cliffs and ledges (Erdle and Hobson 2001).

Little is known about their reproductive ecology. Available data suggests that females form small maternity colonies, and proximity to water may be a factor in selecting nursery sites (Erdle and Hobson 2001). The greatest threats to this bat are human disturbance and vandalism at maternity and hibernating sites. Other possible causes of bat population declines include natural disasters, loss of roosting sites due to sealing mine entrances, cave commercialism, chemical contamination, and loss of foraging habitat.

There are stream corridors and riparian habitat within the Mullenax allotment that would provide foraging habitat for eastern small-footed bats. A total of 15 sites surrounding the four allotments have been mist-net surveyed in 2000, 2002, 2004, and 2006. Only one Myotis leibii, was captured during these surveys approximately 2.5 miles from the Beale-Hacking and Mullenax allotments.

Direct and Indirect Effects

Effects to Habitat – Assuming vegetation control measures would stay within the boundaries of the allotment and outside of the streamside management zones, there is very little potential to affect habitat for the southern water shrew or the eastern small footed bat. Herbicide treatments pose little direct risk to riparian species as they are targeted on specific individual trees. Herbicides would not be used within the streamside management zones. Herbicide does represent a potential risk to water quality if an accidental spill occurs, but proper handling procedures would minimize the risk. Fencing out of the riparian area within the Mullenax allotment would protect stream courses from trampling by herbivory and allow the vegetation to recover in a short period of time.

Effects to Individuals - Should any water shrews be present in the areas of riparian habitat that could be affected by maintenance activities, they likely would be killed or displaced. It is not possible to estimate the amount of mortality or displacement due to lack of information on species occurrences along the streams to be affected and population density in the allotments. However, given the very small amount of habitat and protections afforded to streamside zones, the likelihood of mortality or displacement of water shrews is considered very low.

Cumulative Effects - Given the very small scale of potential direct and indirect effects to riparian habitat, the contribution of the maintenance activities to cumulative effects to riparian habitat in the grazing allotments likely would not be measurable. Likewise, given the low likelihood of direct and indirect effects to individuals, a substantial contribution to cumulative effects to individuals throughout the allotments is not expected. Overall the effects of the Action Alternatives on riparian habitat and populations due to maintenance activities would be extremely negligible. Riparian habitat community viability would be maintained and no adverse effects on sensitive species would be expected. The action alternatives may impact individuals but are not likely to cause a trend toward federal listing or a loss of viability for the sensitive species inhabiting riparian habitat.

Botany – Noxious Weeds/Non-native Invasive Species (NNIS)

Introduction

This report discloses expected direct, indirect, and cumulative effects of the Marlinton Range Allotments project on terrestrial ecosystems and botanical resources. The Marlinton Range Allotments project would continue range management on the Beale-Hacking, Day Run, Kramer, and Mullenax allotments. The two action alternatives under consideration would involve continuation of grazing and various allotment maintenance and improvement activities. These activities include cutting of locust trees on-site for fence posts, brush and noxious weed control, and application of lime and fertilizer. Chapter 2 of the Environmental Assessment gives detailed descriptions of the proposed action and alternatives.

This report is divided into two sections: threatened, endangered, and sensitive plants; and non-native invasive plants. Terrestrial ecosystem issues such as old growth, ecological reserves, and rare

communities are not addressed in detail because the action alternatives involve continuation of range management on existing allotments. The ecosystems under consideration have been altered and managed as pastures for decades, and neither of the action alternatives would involve expansion of the allotments or other impacts on natural communities.

THREATENED, ENDANGERED, AND SENSITIVE PLANTS

Scope of the Analysis

This analysis addresses effects to plant species that are federally listed as threatened or endangered, and also those plant species that are listed as Regional Forester's Sensitive Species (RFSS) on the Monongahela National Forest. Threatened, endangered, and sensitive species are collectively referred to as TES species.

Spatial Boundary

The spatial boundary for direct and indirect effects on TES species consists of the boundaries of the range allotments. These boundaries contain all proposed project activities and are the boundaries within which all direct and indirect effects would occur. The spatial boundary for cumulative effects on TES species is the Proclamation and Purchase Unit boundary for the Monongahela National Forest. This is the boundary to which the National Forest Management Act viability requirement applies.

Temporal Boundary

The temporal boundary for direct, indirect, and cumulative effects on TES species is 10 years from the beginning of project implementation. A review of the NEPA documentation is expected to occur after 10 years, at which time a determination would be made on whether the effects analysis needs to be updated or supplemented.

Affected Environment

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 spirea (*Spiraea virginiana*), and small whorled pogonia (*Isotria medeoloides*). Fifty-four plant species are listed as Regional Forester's Sensitive Species on the Monongahela National Forest. The likelihood of occurrence for each TES species is assessed in the Likelihood of Occurrence document, which is filed in the project record. Likelihood of occurrence is based on field surveys of the proposed activity areas, historic records, and the presence of potential habitat in the project area. Field surveys of the Beale-Hacking, Day Run, and Kramer allotments were conducted during August 2005. The Mullenax allotment was surveyed in June 2007.

Threatened and Endangered Plants

Based on field surveys of proposed activity areas and existing records, none of the four threatened and endangered species are known to occur on any of the four allotments. Potential habitat may occur for two of the species.

Virginia Spirea

Virginia spirea is a clonal shrub found on damp, rocky banks of large, high-gradient streams (USFWS 1992a). Potential habitat does not occur within any of the range allotments.

Running Buffalo Clover
Potential habitat for running buffalo clover typically exists in lightly disturbed forests and woodlands on soils derived from circumneutral (This means soils that contain enough calcium, magnesium or other positive ions to keep the soil from being acidic, commonly referred to as "rich soils".) geologic features (NatureServe 2006). Potential habitat cannot be completely ruled out on any allotment, but only the Kramer allotment is near mapped geologic features that constitute typical habitat for this species. Potential habitat is limited to the wooded and partially wooded portions of the allotments, which includes a small portion of the total acreage. Surveys did not find this species on any allotment.

Small Whorled Pogonia
Habitat preferences for small whorled pogonia 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). Likelihood of occurrence for small whorled pogonia is considered low because most of the allotment acreage is not forested, and site-specific surveys have not located this species. However, potential occurrence cannot be completely ruled out in wooded portions of the allotments.

Shale Barren Rockcress
Shale barren rockcress is not likely to occur in or near any of the allotments due to lack of shale barren habitat. Shale barrens are limited to the drier areas on the eastern side of the Forest.

Regional Forester's Sensitive Plants

Based on field surveys and existing records, none of the 54 RFSS plants are known to occur on any of the allotments. However, based on the Likelihood of Occurrence assessment, potential habitat could occur for 28 RFSS plant species. Of these 28 species, 15 are species of forested habitats, and would appear to have a low likelihood of occurrence on the range allotments. However, each of the allotments includes small amounts of forested habitats around the edges, so the possibility of occurrence of these species cannot be ruled out entirely. Given the lack of known occurrences of RFSS plants despite site surveys, it is unlikely that the activity areas support substantial populations that are crucial for the continued viability of the species on the MNF.

To facilitate analysis, RFSS plants have been grouped according to their primary habitat (Tables 5-7). The three habitat groupings are wetland/riparian habitat, mesic/cove forest, and rocky habitat.

Table 5. Wetland and riparian habitat RFSS plants that could occur in the Marlinton Range Allotments vicinity.

Scientific Name	Common Name	Habitat Comments
Agrostis mertensii	Arctic bentgrass	Open riparian habitats
Baptisia australis var. *australis*	Blue wild indigo	Primarily early successional wetlands
Botrychium oneidense	Blunt-lobed grapefern	Wooded wetlands
Euphorbia purpurea	Darlington's spurge	Open or closed canopy
Hasteola suaveolens	Sweet-scented Indian plantain	Riverbanks and disturbed wetlands
Hypericum mitchellianum	Blue Ridge St. John's wort	Riverbanks and disturbed wetlands
Ilex collina	Long-stalked holly	Open or closed canopy
Juncus filiformis	Thread rush	Bogs and disturbed wetlands

Table 5. Wetland and riparian habitat RFSS plants that could occur in the Marlinton Range Allotments vicinity.

Scientific Name	Common Name	Habitat Comments
Menyanthes trifoliata	Bog buckbean	Bogs and marshes
Pedicularis lanceolata	Swamp lousewort	May prefer circumneutral soil
Poa paludigena	Bog bluegrass	Sun to partial shade
Polemonium vanbruntiae	Jacob's ladder	Swamps, bogs, riparian zones
Woodwardia areolata	Netted chain fern	Swamps and wet woods

Table 6. Mesic forest and cove habitat RFSS plants that could occur in the Marlinton Range Allotments vicinity.

Scientific Name	Common Name	Habitat Comments
Botrychium lanceolatum var. *angustisegmentum*	Lance-leaf grapefern	Moist, shady woods and swamp margins
Corallorhiza bentleyi	Bentley's coral root	Habitat preferences poorly understood
Cypripedium parviflorum var. *parviflorum*	Small yellow lady's slipper	Moist to wet sites
Cypripedium reginae	Showy lady's slipper	Swamps and woods
Hexalectris spicata	Crested coral root	Rich woods
Juglans cinerea	Butternut	Most likely in rich alluvial soil, but could occur elsewhere
Taxus canadensis	Canada yew	Typically in spruce-northern hardwoods; also wetlands.
Triphora trianthophora	Nodding pogonia	Deep leaf litter or humus
Viola appalachiensis	Appalachian blue violet	Often in riparian areas, but can occur in other mesic situations

Table 7. Rocky habitat RFSS plants that could occur in the Marlinton Range Allotments vicinity.

Scientific Name	Common Name	Habitat Comments
Cornus rugosa	Roundleaf dogwood	Rocky areas within forests
Gymnocarpium appalachianum	Appalachian oak fern	Rocky woods
Heuchera alba	White alumroot	Most likely in dry microsites
Juncus trifidus	Highland rush	Rock crevices
Pycnanthemum beadlei	Beadle's mountainmint	Open canopy over rocks
Scutellaria saxatilis	Rock skullcap	Rocky areas within forests

DESIRED CONDITIONS

The Forest Plan addresses TES species at several places in the Forest-wide direction.
The Forest Integrated Desired conditions (USDA Forest Service 2006, p. II-6) call for maintaining habitats that support populations of TES species. Desired conditions for vegetation (p. II-17) emphasize protection and enhancement of rare plants and their habitats. Desired conditions for threatened and endangered species (p. II-22) call for managing habitats to maintain or enhance

populations consistent with recovery plans, and for keeping adverse effects at levels that do not threaten population persistence.

ENVIRONMENTAL CONSEQUENCES

Threatened and Endangered Plants

Direct and Indirect Effects

Virginia Spirea – Potential habitat for Virginia spirea does not exist in any of the four allotments. Therefore, no alternative has any potential to affect Virginia spiraea.

Running Buffalo Clover – If any undiscovered occurrences of running buffalo clover exist on the allotments, both positive and negative effects could occur under the action alternatives. A certain amount of herbivory and trampling by livestock likely would benefit this species, which appears to be adapted to light disturbance of the vegetation and soil (USFWS 1989). However, excessive grazing and trampling without an opportunity for the plants to recover likely would be detrimental.

Broadcast herbicide application would be detrimental and likely would result in the extirpation of any undiscovered occurrences in the application areas. Cut stump, basal spray, and stem injection herbicide application would be unlikely to affect this species due to lack of exposure to the herbicide. Herbicide application would occur only under Alternative 2 (Proposed Action).

The effects of cutting locust trees for fence posts would vary depending on the degree to which the tree canopy is reduced. A slight reduction in the tree canopy resulting in filtered sunlight reaching the ground likely would benefit this species. Heavy cutting resulting in full sunlight would be detrimental due to increased competition from shade intolerant herbs and shrubs.

Application of lime and fertilizer could have both beneficial and detrimental effects. Benefits would include an increase in nutrients available to running buffalo clover. The detrimental effect would be an increase in available nutrients for plants that compete with running buffalo clover, including non-native invasive plants.

Cleaning of ponds and installing a spring tank pipe on the Beale-Hacking allotment likely would not occur in running buffalo clover habitat and would have little or no potential to affect the species. The pond relocation in the Day Run allotment likely would not affect potential running buffalo clover habitat unless the pond is relocated into a wooded area.

Fencing the riparian areas in the Mullenax allotment could have beneficial and detrimental effects if undiscovered occurrences exist in the riparian area. Beneficial effects could include cessation of excessive herbivory and trampling, while detrimental effects could include increased competition from other plants that are no long subject to herbivory and trampling. Fencing would occur only under Alternative 2 (proposed action).

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the beneficial or adverse effects discussed above would occur under the No Action alternative. However, reversion of the range allotments to forest could eventually

create new potential habitat for this species, while the cessation of livestock grazing, trampling, and mowing could reduce habitat suitability for this species.

For all alternatives, the potential effects described above are considered extremely unlikely to occur. This is because all allotments were surveyed during a time of year when running buffalo clover should have been detectable. Also, only a small portion of the acreage of each allotment is considered potential habitat.

Small Whorled Pogonia – The potential for affecting small whorled pogonia is very low because of its low likelihood of occurrence. If undiscovered occurrences exist, detrimental effects could occur due to trampling and herbivory. Mowing is unlikely to occur in the wooded areas that constitute potential habitat for this species.

Broadcast herbicide application likely would result in the extirpation of any undiscovered occurrences in the application areas. The chance of exposure may be low because most brush and weed control is likely to occur in open portions of the allotments. Cut stump, basal spray, and stem injection herbicide application would be unlikely to affect this species due to lack of exposure to the herbicide. Herbicide application would occur only under Alternative 2 (Proposed Action).

The effects of cutting locust trees for fence posts would vary depending on the degree to which the tree canopy is reduced. A slight reduction in the tree canopy resulting in filtered sunlight reaching the ground may not be detrimental based on anecdotal reports that this species often occurs near small breaks in the canopy (USFWS 1992b). Heavy cutting resulting in full sunlight would be detrimental due to increased competition from shade intolerant herbs and shrubs.

Application of lime and fertilizer could have detrimental effects by making soil chemistry less suitable. Small whorled pogonia is believed to prefer acidic, nutrient-poor soil (USFWS 1992b). Lime and fertilizer application could also increase available nutrients for plants that compete with small whorled pogonia, including non-native invasive plants.

Cleaning of ponds and installing a spring tank pipe on the Beale-Hacking allotment likely would not occur in potential small whorled pogonia habitat and would have little or no potential to affect the species. The pond relocation in the Day Run allotment likely would not affect potential habitat unless the pond is relocated into a wooded area.

Fencing the riparian areas in the Mullenax allotment likely would have no short-term effects because the mostly open, heavily grazed riparian area currently is unlikely to support small whorled pogonia. Long-term beneficial effects could occur as the riparian zone becomes forested and develops into potential habitat. Fencing would occur only under Alternative 2 (proposed action).

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the adverse effects discussed above would occur under the No Action alternative. Assuming the openings are not maintained for other purposes (e.g., wildlife habitat), the long-term return of forest under the No Action alternative could benefit small whorled pogonia by increasing potential habitat by a small amount.

For all alternatives, the potential effects described above are considered extremely unlikely to occur. This is because all allotments were surveyed without finding small whorled pogonia, and only a small portion of the acreage of each allotment is considered potential habitat.

Shale Barren Rockcress – Because shale barren rockcress has no potential to occur in the allotments, no alternative would affect this species.

Cumulative Effects
Because the potential for direct effects is either discountable or nonexistent for all four species under all alternatives, no alternative would contribute to cumulative effects on threatened and endangered plants.

Effect Determinations for Threatened and Endangered Plants

Virginia Spirea – Each alternative would have **no effect** on Virginia spirea.

Running Buffalo Clover – All alternatives, including the No Action alternative, **may affect, but are not likely to adversely affect**, running buffalo clover.

Small Whorled Pogonia – All alternatives, including the No Action alternative, **may affect, but are not likely to adversely affect**, small whorled pogonia.

Shale Barren Rockcress – Each alternative would have **no effect** on shale barren rockcress.

Regional Forester's Sensitive Plants

Direct and Indirect Effects

Wetland and Riparian Habitat Plants – The potential for affecting wetland and riparian RFSS plants is low because surveys did not find any of these species in the allotments. However, if undiscovered populations exist, the action alternatives could have the following effects.

Trampling and herbivory by livestock and mowing for weed and brush control could adversely affect any of the wetland and riparian RFSS if disturbance is heavy and frequent. Intermittent disturbance by livestock or mowing would keep the areas open and could benefit the species that prefer full or partial sunlight, which includes nine of the thirteen species in this group (Arctic bentgrass, blue wild indigo, Darlington's spurge, sweet-scented Indian plantain, Blue Ridge St. John's wort, thread rush, bog buckbean, bog bluegrass, and Jacob's ladder).

Cutting black locusts for fence posts could adversely affect the species that typically occur in closed-canopy habitats (blunt-lobed grapefern, long-stalked holly, swamp lousewort, and netted chain fern). By reducing or removing the tree canopy, this activity could increase potential habitat for the other wetland and riparian RFSS.

Herbicide application would harm any of the wetland/riparian RFSS if the herbicide comes into contact with the plants. However, the chance of exposure would be minimal because the herbicides that are typically used on the MNF usually are not broadcast-sprayed in wetlands and riparian areas. Basal spray, cut stump, and stem injection applications would have little chance to impact non-target

plants, even if used in wetland and riparian areas. Herbicide application would occur only under Alternative 2 (Proposed Action).

The effects of lime and fertilizer application are uncertain for most of the riparian and wetland RFSS plants due to lack of information on soil chemistry requirements. Available information suggests that swamp lousewort prefers circumneutral soil, so lime application may benefit this species. Lime and fertilizer application could harm any of these species by providing extra nutrients to competing plants, including non-native invasive species.

The cleaning of ponds on the Beale-Hacking allotment would not affect plants in this group unless one or more of the species has colonized the ponds. The pipe installation could affect potential habitat for these species if it is installed in a wetland. Relocation of the Day Run pond likely would not affect these species unless the pond is relocated to wetland habitat.

Fencing riparian habitat on the Mullenax allotment could have both beneficial and detrimental impacts on the nine wetland/riparian RFSS that prefer full or partial sunlight. Beneficial effects could occur through reduction of heavy grazing pressure and trampling. Eventually, however, fencing would decrease potential habitat for these species by allowing reforestation of the riparian corridor. Riparian fencing would benefit species that prefer forested habitat by increasing the amount of available habitat. Fencing would occur only under Alternative 2 (proposed action).

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the direct effects discussed above would occur under the No Action alternative. Assuming the openings are not maintained for other purposes (e.g., wildlife habitat), the long-term return of forest under the No Action alternative could increase potential habitat for the four wetland/riparian RFSS that occur in forests. Potential habitat would decrease for the nine species that prefer open habitats.

For all alternatives, the potential effects described above are considered extremely unlikely to occur. This is because all allotments were surveyed without finding any RFSS, and only a small portion of the acreage of each allotment is considered potential habitat.

Mesic Forest/Cove Plants – The potential for affecting mesic forest and cove RFSS plants is low because surveys did not find any of these species in the allotments. However, if undiscovered populations exist, the action alternatives could have the following effects.

Trampling and herbivory by livestock could adversely affect any of the mesic forest RFSS by killing individual plants or making the habitat unsuitable. Mowing likely would not be implemented in the wooded areas that constitute potential habitat for these species. Cutting black locusts for fence posts could adversely affect mesic forest RFSS by reducing canopy closure of the forested portions of the allotments.

Broadcast herbicide application under Alternative 2 would kill mesic forest RFSS if any exist in the application areas. The chance of exposure may be low because most brush and weed control is likely to occur in open portions of the allotments. Basal spray, cut stump, and stem injection applications would have little chance to impact non-target plants. Herbicide application would occur only under Alternative 2 (Proposed Action).

The effects of lime and fertilizer application are uncertain for most of the mesic forest and cove RFSS plants due to lack of information on soil chemistry requirements. Available information suggests that crested coral root and butternut prefer rich soil, so lime application may benefit these species. Lime and fertilizer application could harm any of the mesic forest/cove species by providing extra nutrients to competing plants, including non-native invasive species.

The cleaning of ponds and pipe replacement on the Beale-Hacking allotment would not occur in mesic forest and thus would not affect plants in this group. Relocation of the Day Run pond likely would not affect these species unless the pond is relocated to forested habitat.

Fencing the riparian areas in the Mullenax allotment likely would have no short-term effects because the mostly open, heavily grazed riparian area currently is unlikely to support mesic forest RFSS. Long-term beneficial effects could occur as the riparian zone becomes forested and develops into potential habitat. Fencing would occur only under Alternative 2 (proposed action).

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the direct effects discussed above would occur under the No Action alternative. Assuming the openings are not maintained for other purposes (e.g., wildlife habitat), the long-term return of forest under the No Action alternative could increase potential habitat for mesic forest/cove RFSS plants.

For all alternatives, the potential effects described above are considered extremely unlikely to occur. This is because all allotments were surveyed without finding any RFSS, and only a small portion of the acreage of each allotment is considered potential habitat.

Rocky Habitat Plants – The potential for affecting rocky habitat RFSS plants is low because surveys did not find any of these species in the allotments. However, if undiscovered populations exist, the action alternatives could have the following effects.

Trampling and herbivory by livestock and mowing for weed and brush control are unlikely to affect rocky habitat RFSS due to inaccessibility of the habitat to livestock and machinery.

Cutting black locusts for fence posts could adversely affect the species that typically occur in forested habitats (roundleaf dogwood, Appalachian oak fern, white alumroot, and rock skullcap). By reducing or removing the tree canopy, this activity could increase potential habitat for highland rush and Beadle's mountainmint.

Broadcast herbicide application under Alternative 2 would kill rocky habitat RFSS if any exist in the application areas. Basal spray, cut stump, and stem injection applications would have little chance to impact non-target plants. Herbicide application would occur only under Alternative 2 (Proposed Action).

Lime and fertilizer application are unlikely to affect rocky habitat species due to the inaccessibility of the habitat to the machinery used to apply the lime and fertilizer.

The cleaning of ponds and pipe replacement on the Beale-Hacking allotment would not occur in rocky habitat and thus would not affect plants in this group. Relocation of the Day Run pond likely would not affect these species because the pond is unlikely to be relocated to a rock outcrop area.

To the extent that rocky habitat occurs in the riparian areas on the Mullenax allotment, fencing riparian habitat could have detrimental impacts on highland rush and Beadle's mountainmint, which prefer full or partial sunlight. Eventually, fencing would decrease potential habitat for these species by allowing reforestation of the riparian corridor. Riparian fencing could benefit roundleaf dogwood, Appalachian oak fern, white alumroot, and rock skullcap by increasing the amount of available habitat. Fencing would occur only under Alternative 2 (proposed action).

The No Action alternative would involve the cessation of all grazing and associated range management activities. None of the direct effects discussed above would occur under the No Action alternative. Assuming the openings are not maintained for other purposes (e.g., wildlife habitat), the long-term return of forest under the No Action alternative could increase potential habitat for roundleaf dogwood, Appalachian oak fern, white alumroot, and rock skullcap. Potential habitat would decrease for highland rush and Beadle's mountainmint.

For all alternatives, the potential effects described above are considered extremely unlikely to occur. This is because all allotments were surveyed without finding any RFSS, and only a small portion of the acreage of each allotment is considered potential habitat.

Cumulative Effects
Because the potential for direct and indirect effects is discountable for all RFSS plants under all alternatives, no alternative would contribute to cumulative effects on RFSS plants.

Effect Determinations for RFSS Plants
Based on the above effects analysis, the RFSS plants listed in Tables 1 through 3 have the potential to occur in the Marlinton Range Allotments project vicinity. If any of these species occur on the allotments, they could be affected by project activities included in the action alternatives. They also could be affected by the cessation of range management under the No Action alternative. However, no occurrences within project activity areas are known, despite botanical surveys of the allotments. Therefore, the potential for impacts is considered very low. If impacts were to occur, they would affect a very small proportion of the total habitat available with the Forest boundary. **Therefore, for these species, all alternatives, including the No Action alternative, may impact individuals, but are not likely to lead to loss of viability or a trend toward federal listing:**

All other RFSS plants are unlikely to occur in the Marlinton Range Allotments vicinity (see Likelihood of Occurrence document in the project record). Therefore, all Alternatives would have no impacts on all RFSS plants not listed in Tables 9 through 11 above.

NON-NATIVE INVASIVE PLANTS

SCOPE OF THE ANALYSIS
This section covers potential effects of the Marlinton Range Allotments project on the establishment, spread, and control of non-native invasive plants.

SPATIAL BOUNDARY

The spatial boundary for direct and indirect effects consists of the boundaries of the four range allotments. This boundary includes all activities proposed in all alternatives; therefore, it is an appropriate boundary for analyzing direct and indirect effects of the activities.

For cumulative effects, the spatial boundary of the analysis is composed of the sixth-level huc watershed boundaries that contain the allotments, with adjacent watersheds to the east added to fill in gaps (Figure 1). This boundary includes the terrestrial ecosystems within which the effects of the project would occur, but is small enough that any contributions of the project to cumulative effects should still be measurable.

TEMPORAL BOUNDARY

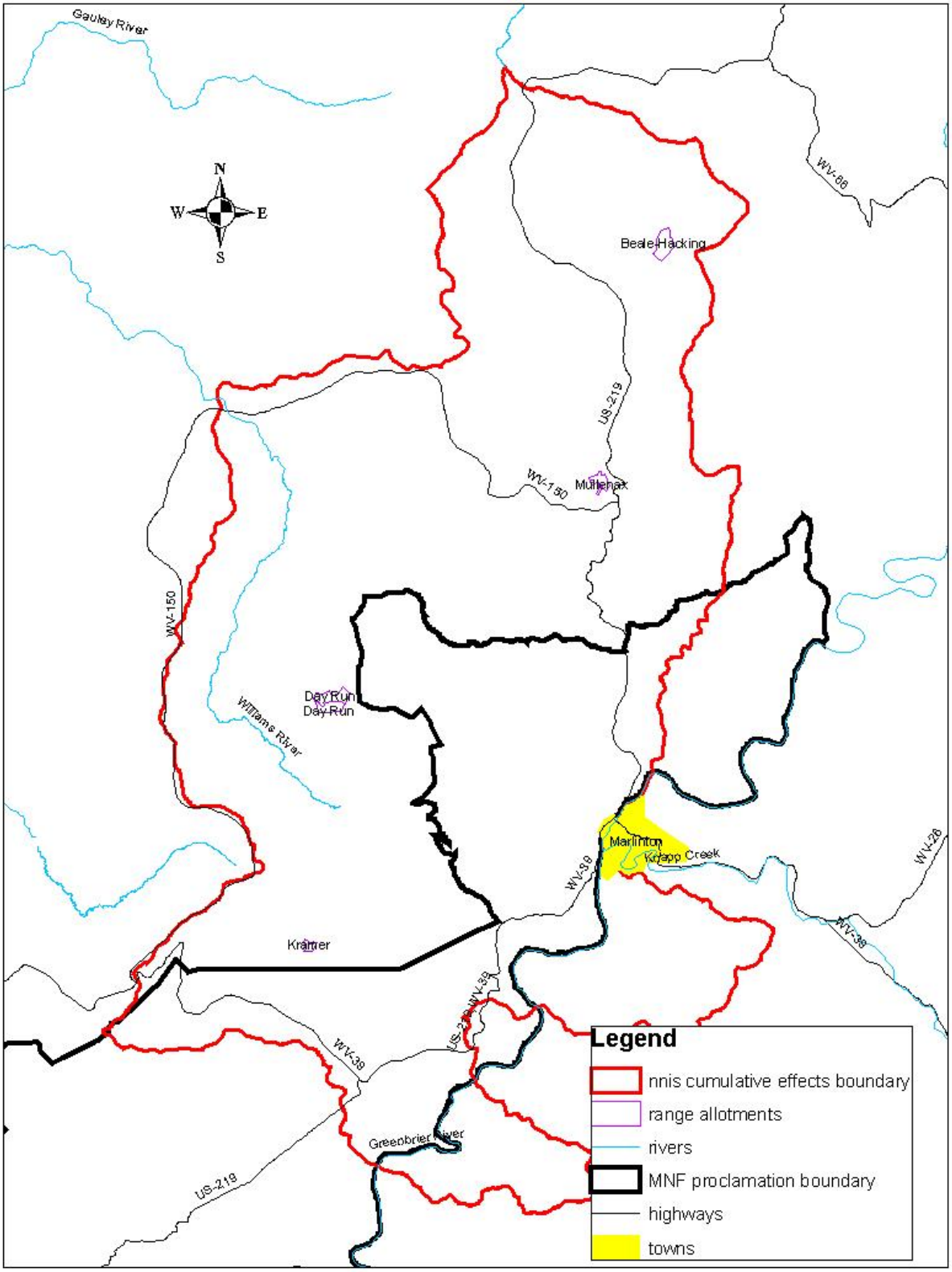
The temporal boundary for direct, indirect, and cumulative effects on non-native invasive plants is 10 years from the beginning of project implementation. A review of the NEPA documentation is expected to occur after 10 years, at which time a determination would be made on whether the effects analysis needs to be updated or supplemented.

AFFECTED ENVIRONMENT

Sixteen non-native invasive plant species are known to occur in the Marlinton Range Allotments (Table 4). The Kramer and Mullenax allotments have the most invasive plant species present (10 and 8, respectively), whereas the Beale-Hacking and Day Run allotments have relatively few invasive plant species (4 and 5, respectively).

Of these sixteen species, only one, Tartarian honeysuckle (*Lonicera tatarica*) is considered a potential threat to surrounding forested ecosystems. This threat is due to its tolerance of shade. Tartarian honeysuckle also thrives in full sunlight and can completely dominate grazing land if left uncontrolled.

Figure 1. Cumulative Effects Analysis Boundary for Invasive Plants – Marlinton Range Allotments Project.



The other species are largely intolerant of shade. Although scattered individuals may occur in forests, they typically require major disturbance of soil and vegetation to attain ecologically damaging densities in forested ecosystems. However, some of these shade intolerant species can overrun open grazing land if they are not controlled. Multi-flora rose and common St. John's wort are the most problematic species in this regard, but all of the broadleaf invasive plants can displace valuable forage grasses to some degree. The invasive grasses found in the allotments are on the invasive list because of their ability to displace native species in naturally open ecosystems, such as limestone glades, pine-oak woodlands, and shale barrens. None of these natural communities occur near the allotments, so these grasses do not present a major ecological threat in the context of this project. In fact, they represent a major component of the available forage grasses on the allotments. However, they generally are considered to have low wildlife habitat value compared to native grasses.

Numerous other invasive plants are known to occur within the cumulative effects boundary. Although a comprehensive inventory is not available, it is likely that most of the invasive plants known to occur on the Forest can be found within the cumulative effects boundaries. Roadsides, riparian areas, and disturbed sites on private land are particular hot spots for the occurrence of invasive plants.

Table 8. Non-native invasive plants known to occur in the Marlinton Range Allotments.

Scientific Name	Common Name	Kramer	Day Run	Beale-Hacking	Mullenax
Lonicera tatarica	Tartarian honeysuckle	X			
Rosa multi-flora	Multi-flora rose	X			X
Festuca pratensis	Meadow fescue	X			
Festuca sp.	Fescue		X	X	
Daucus carota	Queen Anne's lace	X			X
Hypericum perforatum	Common St. John's Wort	X	X	X	
Plantago lanceolata	English plantain	X			X
Cichorium intybus	Chicory	X			
Chrysanthemum leucanthemum	Ox eye daisy	X	X	X	X
Cirsium vulgare	Bull thistle	X			
Rumex crispus	Curly dock	X			
Rumex acetosella	Sheep sorrel				X
Anthoxanthum odoratum	Sweet vernal grass		X	X	X
Poa compressa	Canada bluegrass		X		
Holcus lanatus	Velvet grass				X
Hieracium pratense	Field hawkweed				X

DESIRED CONDITIONS

The Forest Integrated Desired conditions (Forest Plan p. II-6) call for containing the expansion of existing non-native invasive species infestations and preventing the establishment of new invasive species. Desired conditions for vegetation (p. II-17 and II-18) envision use of an early detection/rapid response strategy to prioritize control needs based on threat severity and ability to

achieve control. The desired conditions also call for using native species and desired non-invasive non-native species for revegetation efforts.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Livestock grazing under the action alternatives could affect non-native invasive plants in several ways. The livestock themselves could introduce seeds or pieces of invasive plants on their hooves or in their droppings when the animals are brought onto the allotments in the spring. Invasive plants could also arrive in contaminated hay and feed or on vehicles used to transport livestock to and from the allotments. Conversely, grazing could help suppress existing infestations of invasive plants. The level of control achieved would depend on the timing and intensity of grazing, as well as the palatability of the various species.

Cutting black locusts for fence posts under the action alternatives likely would open up additional growing space for non-native invasive plants. This likely would result in an increase in the size of existing infestations, unless control measures are applied.

The primary purpose of mowing and herbicide application is to control non-native invasive plants. Therefore, implementation of these activities under the action alternatives likely would reduce existing infestations. This is especially true of the shrubby invasive plants Tartarian honeysuckle, multi-flora rose, and common St. John's wort. These species would be the primary target of control efforts. Control efforts likely would be most successful under Alternative 2, which would allow the use of herbicides. Alternative 3 would use only mowing or other mechanical methods, which likely would reduce the effectiveness of control activities.

Lime and fertilizer applications could exacerbate invasive plant infestations by providing additional nutrients. However, when combined with invasive plant control efforts, lime and fertilizer applications could also give pasture grasses a competitive edge over broadleaf invasive plants. In this potential scenario, lime and fertilizer application could aid in the control of invasive plant species.

Pond cleaning and pipe installation on the Beale-Hacking allotment would result in exposed soil, which could be colonized by invasive plants. Likewise, pond relocation in the Day Run allotment would disturb the soil and could open up growing space for additional invasive plants. Soil stabilization using non-invasive plants and straw mulch would reduce the potential for these disturbed areas to become dominated by invasive plant species.

Fencing of the riparian areas on the Mullenax allotment would close off these areas from invasive shrub control efforts. This likely would cause a short-term increase in invasive shrubs such as multi-flora rose, unless additional control efforts were directed at the riparian areas. The increase in shrubby cover likely would begin to shade out many of the invasive forbs and grasses. Over the long term, regrowth of a tree canopy could reduce invasive shrub density, although the narrowness of the riparian area likely would admit enough sunlight to maintain some level of invasive shrub infestation.

The No Action alternative would involve the cessation of all grazing management activities. In the short term, existing infestations of invasive plants likely would increase due to lack of control efforts. Assuming the abandoned allotments are not maintained as wildlife openings, density of invasive and non-invasive shrubs would increase, which would shade out many of the invasive forbs and grasses. Over the long term, forest would reclaim the site, which likely would shade out most of the invasive shrubs, with the possible exception of the shade-tolerant Tartarian honeysuckle.

Most of the effects of the alternatives would be limited to the already altered ecosystems on the four grazing allotments. Therefore, the potential for ecosystem damage due to the negative effects of non-native invasive plant species would be limited. Likewise, the benefits of invasive control activities would not result in restoration of natural ecosystems, but would be limited to improvement of the quality of grazing opportunities and wildlife habitat provided by the allotments. Damage to adjacent natural ecosystems could result if the grazing management activities introduce shade-tolerant invasive plant species such as garlic mustard (*Alliaria petiolata*) and Japanese stiltgrass (*Microstegium vimineum*).

Cumulative Effects

The major potential negative effect of the Marlinton Range Allotments project relative to non-native invasive plants is the potential for introduction and spread of invasive plant species in areas disturbed by project activities. This effect would add to the effects of past activities that may have caused the introduction and spread of invasive plant species. Examples of such past activities include widespread timber harvest, soil erosion, and fires between the years 1880 and 1930, Forest service timber sales and road building in more recent years, historic strip mining on private land and what is now National Forest land, recent timber harvests and road building on private land, livestock grazing and crop farming on private land, and residential development on private land. Specific information on the introduction and spread of non-native invasive plants due to these past activities is not available. However, the current distribution of invasive plant species in disturbed areas strongly indicates that these activities were collectively responsible for the introduction and spread of existing invasive plant species.

Any effects of the Marlinton Range Allotments project also would be additive to the effects of future activities within the cumulative effects boundary. On National Forest land, the only proposed future activities within the cumulative effects boundary are outfitter guide permits and the Upper Williams Watershed Improvement project. The outfitter guide permits would involve hiking, hunting, fishing, mountain biking, canoeing, horseback riding, etc. All of these activities, especially horseback riding, have the potential to spread non-native invasive species. The Upper Williams Watershed Improvement project includes road decommissioning, streambank stabilization, and wildlife habitat improvement, all of which involve short-term soil or vegetation disturbance and could facilitate the spread of invasive plant species. However, these two projects by themselves are not likely to lead to large-scale landscape invasions. Rather, they are likely to lead to small, incremental, and possibly temporary increases in the amount of the landscape that is invaded. The Marlinton Range allotment could make a small contribution to the cumulative effects of these incremental increases. However, because the allotments are already altered ecosystems, continued range management is not likely to make a measurable contribution to cumulative ecosystem degradation caused by invasive plants.

The Upper Williams Vegetation Management project is an ongoing activity within the cumulative effects boundary that would continue for the next few years. This project involves approximately 190 acres of regeneration harvesting, 1,433 acres of thinning, 300 acres of beech bark disease

treatments, and 35 miles of road reconstruction, improvement, storage, and decommissioning. These activities are likely to spread non-native invasive species in the cumulative effects analysis area, which could lead to a certain amount of ecosystem degradation. However, because the allotments are already altered ecosystems, continued range management is not likely to make a measurable contribution to any cumulative ecosystem degradation caused by the Upper Williams Vegetation Management project.

Negative effects related to invasive plants are also likely to occur due to continuing activities on private land, such as timber management, agriculture, off-road vehicle use, road construction and maintenance, residential development, and a host of other activities. Specific, quantitative information for future activities on private land in the cumulative effects boundary is not available. However, based on the recent past and the current condition of much of the private land in the area, it is likely that these activities would continue the landscape-level ecosystem alteration due to invasive species. In comparison, the activities proposed for the Marlinton Range Allotments are very small-scale and relatively benign. It is very unlikely that any of the alternatives would make a measurable contribution to the cumulative ecosystem alteration that is occurring due to activities on private land in the cumulative effects boundary.

The major potential positive effect of the project is the control of invasive species on the range allotments. Available information does not indicate that any other invasive species control work is proposed in the cumulative effects boundary, either on National Forest or private land. Therefore, this project's contribution to invasive species control is likely to be very small when measured at the scale of the cumulative effects boundary.

Social Environment

Cultural/Archeological Resources

Affected Environment

Physical Description

The description of physical conditions for each of the four allotments can be found in Chapter 2 of the document.

Cultural Description: Prehistory and History

The physical and environmental conditions that prevailed in this watershed's past are integral to understanding the prehistoric and historic human adaptation. Studies of pollen and spore analyses from the region and comparative data (e.g., Carbone 1976; Davis 1983; Wilkins 1977) indicate that a southward displacement of boreal floral and faunal species followed the terminal glacial retreat. Pockets of tundra vegetation, dominated by spruce, fir and pine, extended from the north into the uplands region of the Appalachian range between 25,000 and 15,000 BP (before present). The transition to more modern flora begins between 12,500 and 10,000 with an increase in deciduous forest, with species including oak and ironwood present. This period coincided with the first probable human use of the region. This epoch also saw the extinction of many faunal species including elephants, camel, mastodon, giant bison, giant peccary, giant beaver, ground sloth, and woodland musk ox. By 10,000 the transition to a mixed coniferous-deciduous forest had begun.

By 7,500 BP mixed hardwood forests are present on the Allegheny Plateau, with the expansion of birch, oak and hickory communities. Continued warming trends led to mixed hardwood forests at higher elevations. Around 5,000 BP spruce forests experienced a resurgence in Pennsylvania and West Virginia, probably indicating the spread of diverse open forest canopies and bog settings (i.e., the growth of *Picea rubens*). Modern climatic conditions were probably in place by around 3000 BP, although various peaks-and-valleys in temperature and moisture regimes continued to the present. This affected both the vegetation mixes and fish/wildlife species and, by direct extension, subsistence patterns for people.

Human use of the landscape during the Paleo-Indian and Early/Middle Archaic sequences (ca. 11,000-6,000 BP) was largely restricted to hunting/gathering/fishing, and establishment of domestic sites. The bedrock types in the study area may have encouraged quarrying for raw material to make stone tools. The presence of potential campsites in the form of rockshelters, although limited, also may have encouraged human use of the landscape at this time.

The implications of the early prehistoric period on the reference condition of the project area are minimal. Some modification of plant communities occurred through harvest and selective protection; some animal populations were controlled through hunting and trapping; and the use of fire as a habitat management tool may have occurred. However, by and large, human populations are perceived to have been too small during the early periods (Paleo-Indian and Early/Middle Archaic) to cause significant effects on the environment.

In contrast, Late Archaic and Woodland Period societies (ca. 6,000 BP to 1600+ AD, including early European colonization/Contact Period) had increasingly noticeable impacts on the environment. Larger populations, new technologies, an evolving subsistence strategy, and associated increases in the size and duration of occupation of villages, all led to deeper and more widespread human impacts. The major activities that changed the environment were: the intentional encouragement and protection of plant communities; burning to open up the understory and enhance game habitat, targeting berry and mast species, and contributing to an oak presence; the adoption of horticulture and agriculture over the last 2,000 years, requiring cleared gardens and fields, many near streams and rivers; and biodegradation of local environments associated with, for example, long-term village locations.

In summary, subsistence activities and residential sites would have had an effect on the health and diversity of the forest community, size and behavior of wildlife species, and fragmentation of the forest. It also increased sedimentation rates in the streams near villages. The Native American population was displaced through disease and war, starting in the 17th century. The effect of smallpox on the Native American was enormous: by some estimates more than half the pre-European population was killed by smallpox before they had even laid their eyes upon a wagon. Thus, the pre-Contact patterns of their lifestyle are now known only through archaeology, oral history and a handful of early settlers' or explorers' accounts.

The European presence on the landscape changed everything. Colonization of the region began in earnest after more than a century of socio-economic disruption, demographic decline, disease, and three wars involving Indians and Europeans. A series of forts and trading posts were established in this portion of what was then Virginia between 1760 and 1791. After the conquest and pacification of the Ohio Valley tribes in the 1790s, the earliest towns were chartered; the first and nearest to the project area was Edmunton (later Beverly). The area around Marlinton, although initially attempted

at settlement in the 1750s, remained thinly settled and relatively undeveloped until the late 19th century. The late 1880s and 1890s promised growth and prosperity through the exploitation of coal and timber, aided by rail transport. This period saw the birth of numerous planned communities in West Virginia. Marlinton was one of these, having been purchased and platted in 1891 by the Pocahontas Land Development Company.

The next three decades witnessed more major changes to the landscape and impacts on the environment than the cumulative impact of 12,000 years of Native American land-use. By some estimates, upwards of 30 billion board feet of timber were cut in West Virginia between 1870 and 1920 (Clarkson 1964). The area was also subjected to slash fires and was more severely flooded as a result of increased surface runoff. Recognizing the devastation brought about by unregulated logging, President Wilson declared the boundaries of the Monongahela National Forest in 1920. Subsequently, significant reforestation was accomplished through the efforts of the Civilian Conservation Corps in the 1930s and 1940s. Under the stewardship of the National Forest, the area is once again thriving, albeit with significantly altered floral, faunal, sediment, and hydrological regimes.

Exhaustion of the forests, coupled with the Great Depression, brought about a precipitous economic and social decline. Many towns and small communities were abandoned. Within the project area, the infrastructure aspects of this settlement/industrial system (i.e., homes, farms, schools, mill sites, transportation systems, etc.) should tend to cluster around major transportation arteries. Within National Forest System lands, much of this infrastructure now exists only as archaeological sites and some "cultural landscapes".

Previous Survey Information

A total of two heritage resource surveys have been conducted either wholly or partially within any of the four allotments in the current analysis area. These surveys provided total coverage for a single allotment, partial coverage for one, and no coverage for the remaining two allotments. Surveys in advance of the actions proposed in Alternatives 2 and 3 have been scheduled.

Previous Site Data

Despite the fact systematic surveys have only been conducted on a small portion of the total project area, a total of nine heritage resource sites have been recorded previously within the four range allotments analyzed here. Of these, 4 represent the remains of prehistoric resource exploitation and/or habitation, while the remaining five represent Euro-American historic period activities. Table 9 presents information on each of these sites. Sites are presented by site number without reference to specific physical locations. Such locations have been made available to Forest personnel as part of planning for specific management actions.

Table 9. Previously identified heritage sites in the project area

Site Number	Period	Evaluation Status	Ownership
04-021	Historic	Unevaluated	US
04-022	Historic	Unevaluated	US
04-051	Historic	Unevaluated	US
04-168	Historic	Not Eligible	US
04-183	Prehistoric	Eligible	US
04-184	Prehistoric	Not Eligible	US

Table 9. Previously identified heritage sites in the project area			
Site Number	**Period**	**Evaluation Status**	**Ownership**
04-185	Prehistoric	Eligible	US
04-186	Prehistoric	Eligible	US
04-187	Historic	Not Eligible	US

Prehistoric and Historic Patterns

The project area holds a very high probability for containing numerous prehistoric resources owing to its location just west of the edge of the Greenbrier Limestone formation, in which high-quality chert is often found. Research conducted on some prehistoric sites in the project area indicates Early and Late Archaic utilization of the resources in the area. The dated prehistoric sites are all open-air occupations; this is not necessarily surprising given the dearth of rockshelters in the vicinity.

The results of archaeological surveys within the wide region indicate that historic period activity in the area was relatively balanced between commercial resource extraction activities and human settlement. Logging and railroad-related sites are fairly evenly balanced with permanent Euro-American homesites. The historic period occupation of the immediate area was, and continues to be, focused on the areas along the Greenbrier River and its tributaries, including Marlinton and nearby communities.

The vast majority of the project area has felt the impact of human use. Forest species age and diversity, wildlife populations, stream profiles, soils, viewsheds, fragmentation/openings ratios, and the demographic profile of the area (Indian-to-colonial; low-to-moderate population density) all changed between the 18th and early 20th centuries. Some of these changes were dramatic.

There are numerous sites and features left on the landscape; they are the correlates to the standing architecture and functional outbuildings of the historic economy. We would therefore expect the remains of communities, houses, barns, outbuildings, mills, blacksmith shops, schools, logging camps, mining structures, etc. Also, the footprints of transportation systems, and vegetative "artifacts" in the form of complete and partial cultural landscapes (apple orchards, pine plantations, sugar bushes, openings, and more) would likely be located. Their distribution is heavily biased toward the main transportation arteries

Alternatives 1-3: Potential Effects and Mitigation Measures

Potential Effects to Heritage Resources: All Alternatives

It should be noted prior to a discussion of the effects of the proposed project that, at the time of the preparation of this contribution to the Draft Environmental Analysis, not all of the necessary heritage resources surveys have been completed. It is, however, fully expected that such surveys would be completed prior to the preparation of the Final EA. Also, it should be stated that the following effects analysis may be amended with the addition of new survey data should new heritage sites be identified as the result of further surveys.

No Action

From the perspective of heritage resources protection, the No Action alternative would provide greatest protection to cultural resources, as no additional erosion or soil disturbance would occur.

Alternatives 2-3
An examination of the two alternative management treatments for the four range allotments reveals that, given the implementation of the design criteria presented in the discussion of each alternative, no effects should accrue to heritage resources sites as a result of the implementation of either alternative.

Direct and Indirect Effects
Any ground-disturbing activities, such as grubbing, bulldozing, road construction, pond excavation, etc., all have a high likelihood of disturbing cultural resources if carried out on a site location. However, as a standard Forest procedure, all recorded sites that are either unevaluated or are determined eligible for inclusion in the National Register of Historic Places, would be excluded from the project area. Therefore, no direct effects are expected to occur as the result of the implementation of any of the action alternatives.

The only indirect effects expected from implementation of the alternatives may be the result of increased erosion brought about by creating of animal paths near site locations.

Cumulative Effects
The foreseeable effects of carrying out all of the action alternatives are approximately equal. Management of the project area for range purposes would lead to some increase in pedestrian and vehicular use of the landscape. Consequently, more individuals would become aware of site locations, thereby exposing them to potential vandalism and loss of scientific information.

Comparison of Alternatives
Of the three alternatives, the option with the least amount of both direct and indirect effects is Alternative 1, the No Action alternative.

Visual Quality

The allotments provide vistas where people can see mid-ground and distant views, which is in contrast to the common experience of driving secondary roads with an enclosed canopy of woodland. Providing opportunities for viewing livestock grazing in a pasture helps maintain the character of the rural/pastoral landscape historically found in and around the Monongahela National Forest and in the mid-Appalachians.

Under the No Action Alternative 1 and the No Herbicide Use Alternative 3 there would be no treatment of noxious weeds/brush with herbicides. Therefore, there would be no vegetation with yellowed, browned, or bluish leaves to be observed by the public. Under the Proposed Action Alternative 2, where herbicide would be used to control noxious weeds/brush, in the short term there would be a yellowing and then browning of treated vegetation, since treatments would be done while plants are green and actively growing. Only selected, scattered plants would be treated and color changes to this vegetation would be temporary. Also for a short time after treatment, treated plants may appear blue when viewed close up because a blue colorant would be added to the herbicide mixture. As time after treatment passes the blue, yellow or brown leaves of plants treated with herbicide would fade or fall off and the visual impact of dead leaves would not be noticeable. Most treated vegetation would be viewed from a vehicle while it is moving and would be in the distance.

It is unlikely that the average person would even notice the changes in color of scattered, treated vegetation. Also see the effects section on herbicides.

For the discussion of the cumulative effects to visual quality the boundary is defined as all MNF lands over the last five years, as well as five years into the future.

The mowing of vegetation, as would occur under any of the action alternatives, would appear similar to the cutting of hay that annually occurs on many acres of private hayfields in and around the Forest. Mowed vegetation would appear brown as it dries out and lays on the allotment. This effect is short term in that the living grass underneath soon grows up through the brown thatch and is overtopped by new green growth. This activity is considered by the public as a normal management activity and not as an adverse effect to the visual quality of the area. Many people enjoy seeing well managed agricultural land, as opposed to weedy, irregularly vegetated fields.

Under the Proposed Action Alternative 2, where use of a herbicide would result in some yellowing and browning of vegetation, there would be a short-term, localized and non-substantial adverse effect to the visual quality of the Forest. The four areas proposed for treatment with herbicide would be treated at different times, are widely scattered, and are small areas compared to the size of the entire Forest. Individual trees and shrubs are constantly dying across the Forest from insect attacks, drought, lack of light, etc. Mortality of scattered shrubs from herbicide treatment would likely be interpreted by the average person as part of these natural events. It is concluded there would be a very slight, non-substantial adverse cumulative effect to the visual resource from the Proposed Action. This would be off set by the visual value of public lands with reduced quantities of noxious/non-native vegetation and their appearance as well managed lands.

Under the No Action (Alternative 1) and No Herbicide Use Alternative 3, no herbicides would be applied and no yellowing/browning of vegetation would occur from herbicide use. For these alternatives there would be no adverse cumulative effect to the visual resource of the Forest.

Recreation

Existing Condition
There are no developed recreation areas located within these allotments. Day Run Campground, located about 5 miles from the Day Run Allotment, is the only recreation facility in the general vicinity of any of the allotments. There are no Forest system trails within or near these allotments.

These four areas support dispersed recreation, with hunting being the primary recreation activity. It is possible that other dispersed activities are occurring in these areas, such as bird watching or general wildlife viewing, however participation in these pursuits is likely minimal. I have never observed dispersed campsites (hunting camps) in any of these allotments, and it is unlikely this use is occurring.

- The Beale-Hacking Allotment is located on Buzzard Ridge, which receives moderate hunting activity. The area is accessed by FR 1026A, which is open for public traffic during the period August 15 – April 15. During this period, most public travel is related to the fall deer and bear hunting seasons, and the Beale-Hacking area is a likely destination for some of these hunters.

- The Day Run Allotment is accessed by FR 999, which is open to public traffic for the deer gun season, thru December 31. This area also receives moderate hunting activity, both from visitors, and adjacent camp-owners. There has been a traditional problem with illegal off-road vehicle use in this allotment, including damaged gates and gates left open, which seems to occur throughout the year.
- The Kramer Allotment is located at the terminus of an open state maintained road. This road is very rough, and likely receives very little traffic. This general area of the Ranger District, including the Kramer Allotment, receives light hunting activity. The High Rocks Academy, located nearby, uses this allotment to graze horses. Students from the Academy likely use this area for nature study and dispersed hiking, including treks to the High Rocks, located north of the allotment.
- The Mullenax Allotment is located at the terminus of a short road open to public traffic, located very close to Highway 219. This allotment likely receives moderate hunting activity during the spring and fall hunting seasons.

None of these allotments are located within the corridor of a designated or eligible Wild and Scenic River. The Day Run Allotment is located within the Williams River watershed; however it is approximately two miles from the river corridor. The Williams River is an eligible Wild and Scenic River, with a recreational classification.

Alternative 1 (No Action)
Alternative 1 would not have any direct effects to recreation resources. The allotments would still be open; thus, providing open habitat for wild game species like the wild turkey, black bear, whitetail deer, etc. However, indirectly and cumulatively, the No Action Alternative would have a negative effect on recreational hunting because the allotments would revert back to wooded areas, not providing the open area suitable for traditional wild game species mention above.

Direct and Indirect Effects for Action Alternatives 2 and 3
By providing habitat diversity and important and relatively uncommon habitat for several game species, such as woodcock, wild turkey, ruffed grouse, black bear and white-tailed deer, grazing areas and adjacent woodlands are frequently used by sportsmen for recreational hunting with both archery equipment and firearms. The habitat that grazing areas provide attract and produce selected species of both game and non-game wildlife for wildlife viewing by the public. Examples include various species of songbirds not found in larger tracts of forested land, some raptors species such as red-tailed hawks and horned owls, large and small mammals such as red foxes and meadow voles, and reptiles such as black rat snakes. Maintaining these four allotments in an open, herbaceous condition and adding soil amendments to them, as in the Proposed Action and the No Herbicide Use Alternative, improves forage quality for wild herbivores, as well as for livestock. Grazing allotments provide open space for recreational use and enjoyment as well as scenic/visual diversity for Forest visitors. Non-forest areas provide a location for kite flying. Some allotments are used for cross-country skiing when snow conditions allow.

The blooming wildflowers and associated bees and butterflies, and the fruits from apple trees and blackberry and blueberry plants found on these allotments, also attract forest product gatherers. Because of a concern for human safety camping is normally not promoted in grazing allotments on the National Forest during the time livestock are within the allotment. Although there are no known instances, it is possible that bulls, or cows with calves, could injure people, especially children, who may not know how to react to livestock.

Cumulative Effects
For the discussion of the cumulative effects to recreation the boundary is defined as all MNF lands over the past five years, as well as five years into the future.

Recreational activities that take place in and around the allotments are just a small part of the Forest's total dispersed recreational use. Each year, as the Forest continues to maintain or upgrade areas associated with dispersed recreation, including roads and signage, the level and quality of dispersed recreational opportunities improves incrementally on the Forest.

None of the proposed allotments are in wilderness. There are no plans by the Forest to greatly increase its promotion of dispersed recreation opportunities on the Forest in the near future. It is concluded that under any alternative there would be no substantial adverse cumulative effects to recreation on the MNF.

Economics

Direct and Indirect Effects
The continuation of livestock grazing on the allotments would continue to provide some local farmers with summer pasture for some or all of their livestock. This allows them to use their own lands for the production of winter feed for their livestock, or to operate a larger livestock operation/herd than they could with their property alone. Most Monongahela National Forest allotments are cow-calf operations where a herd of cows produce calves each year. If these four grazing allotments were discontinued under the No Action Alternative, the farmers using them might go out of business or have to reduce the size of their livestock operation because they would not have enough of their own land to support their existing herd year-round.

Permittees grazing cattle on the allotments pay an annual grazing fee to the U.S. Treasury. Except under the No Action Alternative, these areas would be advertised to the public under competitive bidding and the allotments would be provided to the highest bidder. Bids received vary by the location of the allotment, the condition of its facilities, the quality of the forage, etc. Competitive bidding results in more money going to the federal treasury and in the government more likely receiving fair market value for its forage. It is more economical to maintain existing non-forested/early seral/herbaceous areas, such as these grazing areas, to provide habitat for selected wildlife species than to create new, herbaceous habitat for use by wildlife from presently forested land.

Permittees are required to maintain existing allotment facilities with their own labor. The Forest Service may provide major materials, such as fence posts and fence wire to the permittee for repairs. This reduces the cost to the government in managing the vegetation on these areas. Local farm supply businesses benefit from the purchase of grazing related materials and supplies.

Noxious weed control costs are approximately $125 per acre using herbicide, and around $175 per acre for both mechanical and manual methods of treatment. NNIS control would be the most costly under Alternative 3 since the use of herbicide would be excluded. However, if noxious weeds are not effectively controlled, forage quantity and quality on these grazing areas would continue to decline. This would reduce the grazing capacity of these areas which would eventually affect the grazing fees generated. Non-native invasive species would continue to increase.

Recreational activities occurring within and adjacent to allotments, such as hunting, wildlife viewing, viewing scenery, fruit and berry picking, photography, etc. help stimulate the local economy with recreationists purchase supplies and equipment, vehicle fuel, licenses, food and lodging, etc.

Cumulative Effects

For the discussion of the cumulative effects to economics the boundary is defined as all MNF lands for the last five years and five years into the future.

Compared to the total size of the local economy and compared to the other activities that occur on the MNF that produce revenue to the Federal Treasury or to the local economy, such as the sale of timber, mineral leasing, or recreation, effects to the local economy from these four proposed allotments is extremely small. Although only incrementally, the four proposed allotments assist in diversifying the local economy. It is concluded that implementation of any of the alternatives would have a very minor but positive effect to the local economy.

CHAPTER 4 – CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION

The MNF consulted and received input from the following Federal, State and Local Agencies, and individuals, during the development of this environmental assessment:

ID TEAM MEMBERS:
Rondi Fischer, Marlinton-White Sulphur District Ranger
John Calabrese, Forest Archeologist
David Gibson, Marlinton-White Sulphur Biological Technician
Jennifer Condon, Assistant Forest Soil Scientist
O'Dell Tucker, South Zone NEPA Coordinator
James McCormick, Marlinton-White Sulphur District Biologist
Tim Henry, South Zone Recreation Program Manager
Kent Karriker, Botantist/Ecologist
Thomas Cain, Fisheries Biologist
Patricia Felton, South Zone GIS Specialist

FEDERAL, STATE, AND LOCAL AGENCIES
Shawn Head, WVDNR
US Fish and Wildlife Service, Elkins Field Office
Natural Resources Conservation Service

INDIVIDUALS/ORGANIZATIONS
Susan Burt, High Rocks, Permittee
James T. Daniels, Permittee

CHAPTER 5 - APPENDICES

Appendix A – Issues

No issues were raised during scoping that would warrant developing an alternative. The District Ranger wanted to develop Alternative 3 to analyze the effects of not using herbicides to control non-native invasive plant and woody species.

Appendix B – Design Criteria (Forest Standards and Guidelines)

Range Resources

Forest Service Manual and Handbook direction for rangeland resources is in FSM 2200 - Range Management, and FSH 2209 - Range Management, and includes both Service-wide and Regional Office direction.

Type	Number	Direction Description
Livestock and Allotment Management		
Standard	RA04	Allotment management plans (AMPs) shall be prepared and maintained on grazing allotments commensurate with the planned intensity of management. Design AMPs to maintain or improve vegetation, soil, and water resources. AMPs shall be coordinated with livestock production systems in use on adjacent lands to achieve balanced and sound management. Seek permittee involvement in the preparation of AMPs.
Guideline	RA05	Existing special use pasture permits may be converted to grazing permits where the land area can be managed as a grazing allotment.
Guideline	RA06	Newly acquired lands that are suitable for livestock grazing may be converted to grazing allotments.
Guideline	RA07	Additional areas for livestock grazing may be developed based on management prescription emphasis, land capability, cost effectiveness, resource condition, the needs of other resources, and the demand for forage and grazing levels.
Guideline	RA08	Open areas within allotments should be maintained for visual, wildlife, recreational, and forage purposes. Grazing should be one means of accomplishing this purpose and should be used where practical and efficient. Efficiency refers to a relative comparison of alternative means to keep the land in an open condition, not necessarily the efficiencies of the grazing operation.
Guideline	RA09	If water availability allows, rotational grazing should be encouraged to: a) Allow regrowth of the most desirable forage species, b) Avoid overuse of the most desirable areas, and c) Distribute use more evenly over the allotments.
Guideline	RA10	Give preference for grazing opportunities to local, resident landowners. Use competitive bidding to select new permittees.
Range Improvements		
Standard	RA12	Stream access points shall be selected for streambank and channel stability. Stabilization of the access points shall be accomplished if needed. When monitoring indicates that streambank stability is not being maintained, perennial or intermittent streams shall be fenced from livestock, and alternative crossings shall be designated.
Standard	RA13	A minimum 25-foot buffer strip shall be maintained between watercourses, both permanent and intermittent, and applications of lime or fertilizer.
Standard	RA14	Soil amendments may be added to grazing areas only after soil analysis or indicator plants demonstrate a need. Types and rates of application shall be determined through a soil analysis.
Standard	RA15	Corrals, loading chutes, water troughs, and other similar livestock facilities shall be located on well-drained ground and on soils that can withstand the degree of use planned. Gravel may be applied to harden or armor areas of heavy use.
Standard	RA16	Walk-through gates, stiles, or other devices shall be installed in fences that bisect system trails.

Forest Service Manual and Handbook direction for rangeland resources is in FSM 2200 - Range Management, and FSH 2209 - Range Management, and includes both Service-wide and Regional Office direction.		
Type	**Number**	**Direction Description**
Standard	RA17	Hawthorne management shall be addressed in AMPs for allotments where hawthorne occurs, using Integrated Resource Management or other appropriate procedures. Hawthorne stands shall be inventoried within grazing allotments to establish baseline conditions for management planning and treatments.
Guideline	RA18	Bog, seep, or spring areas within or adjacent to allotments may be used to provide water to livestock watering facilities and should be protected by fencing.
Guideline	RA19	Favor introduction of legumes into pastures over nitrogen fertilizer application.
Guideline	RA20	Revegetation activities should use a variety of native species and maintain or improve vegetative diversity. Monoculture conditions should be avoided.
Guideline	RA21	Supplements (minerals, salt, etc.) should be provided in moveable feeders and used to improve livestock distribution and use over the allotment as needed.
See also Soil and Water Goal SW01, Fire Management Goal FM06, Vegetation Goals VE01 and VE19, Soil and Water Standards SW24 and SW41, Vegetation Standards VE13, VE22, VE23; TEP Species Standard TE34, Heritage Resources Standards HR05 and HR06, Soil and Water Guidelines SW56, SW57, and SW58; TEP Species Guideline TE82, Wildlife and Fish Guideline WF15, Heritage Resources Guideline HR12.		

MANAGEMENT PRESCRIPTION STANDARDS AND GUIDELINES

Management Prescription 3.0 – Vegetation Diversity

Management Direction for 3.0 – Vegetation Diversity Emphasis		
Type	**Number**	**Direction Description**
2200 – Range		
Standard	3003	Management of open areas within allotments shall be primarily for livestock grazing. Intensive management for livestock grazing may occur.
2350 - General Forest Environment Areas		
Standard	3005	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.
2630 – Wildlife Habitat		
Guideline	3014	Conifer species may be planted or controlled where needed to enhance vegetative diversity for wildlife.
7100 - Transportation System Planning		
Guideline	3016	New road construction 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.
7730 – Transportation System Operation		
Guideline	3017	Public motorized vehicle access and use is compatible with this Management Prescription.

Management Prescription 4.1 - Spruce and Spruce-Hardwood Ecosystem Management

Management Direction for 4.1 - Spruce and Spruce-Hardwood Ecosystem Management		
Type	**Number**	**Direction Description**
1900 - Vegetation		
Standard	4109	Maintain culls and snags to provide for wildlife habitat. Manage culls to provide dens

Management Direction for 4.1 - Spruce and Spruce-Hardwood Ecosystem Management		
Type	**Number**	**Direction Description**
		and future snags. If non-commercial and in excess of wildlife needs, culls may be girdled or injected with herbicide to produce snags. When thinning or implementing other vegetation management, retain at least 5 culls per acre, if available. Retain culls and all snags except as noted below. a) Snags and culls may be removed when they are public safety hazards along roads, trails, or established campsites, or safety hazards in harvest units. b) Snags and culls may be removed for scenery management purposes in locations of very high or high scenic integrity such as in a vista or in the immediate foreground of a road open for public motor vehicle travel. See also snag and cull direction in TEP Species section for those areas that intersect with Indiana bat primary range.
Guideline	4110	Red spruce should be restored, maintained, or enhanced in stands where potential natural vegetation includes a spruce component and there is some spruce present in the overstory or understory within or immediately adjacent to the stand. Spruce restoration should not normally be conducted in stands without an understory red spruce component or natural red spruce seed source. In stands greater than 80 years old, with greater than 30% spruce in the overstory, community compostion and structure should be maintained primarily through natural processes.
See TEP Standard TE64 for vegetation management activities that may occur in WVNFS suitable habitat.		
2200 - Range		
Standard	4112	Grazing allotments shall be fenced, including division fences to allow rotational grazing. Barbed or electric fences are allowed, but wooden rail fences are preferred. Woven wire shall not be used in new fences.
Guideline	4113	Ponds, water troughs, pipes, salt boxes, gravelling around troughs and similar developments may be used, but landscaping materials and locations should be chosen to blend in with the natural environment.
See TEP Species Standard TE65 for restrictions on recreation facility development within WVNFS suitable habitat.		
2630 – Wildlife Habitat		
Guideline	4131	Maintain natural areas of standing water as wildlife watering sources. Artificial areas of standing water may be created in conjunction with other resource activities as the opportunity arises.
Guideline	4132	Roads intended for intermittent use should be revegetated between uses and typically managed as wildlife habitat.

Management Prescription 6.1 - Wildlife Habitat Emphasis

Management Direction for 6.1 – Wildlife Habitat Emphasis		
Type	**Number**	**Direction Description**
1900 - Vegetation		
Standard	6107	Maintain culls and snags to provide for wildlife habitat. Manage culls to provide dens and future snags. If non-commercial and in excess of wildlife needs, culls may be girdled to produce snags. When thinning or implementing other vegetation management, retain at least 5 culls per acre, if available. Retain culls and all snags except as noted below. a) Snags and culls may be removed when they are public safety hazards along roads, trails, or established campsites, or safety hazards in harvest units. b) Snags and culls may be removed for scenery management purposes in locations of very high or high scenic integrity such as in a vista or in the immediate foreground of a road open for public motor vehicle travel. c) See also snag and cull direction in TEP Species section for those areas that intersect with Indiana bat habitat.
Guideline	6108	Grapevines should not be controlled unless necessary to achieve wildlife habitat objectives.

Management Direction for 6.1 – Wildlife Habitat Emphasis		
Type	**Number**	**Direction Description**
		Grapevine control needs should be evaluated at the project level.
Guideline	6109	Camphor vines should be controlled when needed to ensure adequate stocking of desirable species.
Guideline	6110	Oak species should be restored, maintained, or enhanced in stands where existing natural vegetation includes an oak component and or there is some oak present in the overstory or understory within or adjacent to the stand. Final overstory removal should not normally be conducted in stands without adequate advance reproduction of oak or sprouting potential.
2200 – Range		
Standard	6112	Grazing allotments shall be fenced, including division fences to allow rotational grazing. Barbed or electric fences are allowed, but wooden rail fences are preferred. Woven wire shall not be used in new fences.
Standard	6113	Planting non-native forage plants is prohibited without a project-level analysis.
Guideline	6114	Ponds, water troughs, pipes, salt boxes, gravelling around troughs and similar developments may be used, but landscaping materials and location should be chosen to blend in with the natural environment.
Guideline	6115	Mowing practices should judiciously leave clumps of shrubs, shrubs along stream courses and wet areas, along woodland borders, steep slopes, rocky or rough areas, and sites needed for diversity and edge effect.
2350 – Recreation: General Forest Areas		
Standard	6117	Trail management shall be compatible with the ROS setting of the area.
Guideline	6118	New trail construction should not cause trail density in the prescription unit to exceed two miles per square mile. This guideline does not apply to existing trail relocation.
Guideline	6119	Selected areas, trails, or roads may be open, where appropriate, to motorized vehicles during specific periods for specific purposes such as firewood access, hunter distribution, emergencies, or administrative use. Travelways should normally be closed to public motorized vehicles from April 15 to August 1 to reduce disturbance to wildlife.
Guideline	6120	In areas where oak restoration is emphasized, work with WVDNR to facilitate hunter access during deer season.
2380 – Scenery Management		
Guideline	6121	Natural-appearing materials should be used to build and maintain trails and recreation facilities.
2630 – Wildlife Habitat		
Guideline	6138	Developed openings should be located away from open roads or main collector roads, and from active hiking and mountain biking trails. They should be accessible for maintenance and where feasible, dispersed within the prescription area.
Guideline	6139	Conifer trees may be planted or controlled where needed to maintain or enhance vegetation diversity for wildlife. Habitat management should not seek to convert conifer stands to hardwoods or eliminate the conifer component of mixed stands.
Guideline	6140	Between periods of use, local roads closed to public vehicle use should be seeded to wildlife food plants and managed as wildlife openings and hiking travel ways.
2700 – Special Uses		
Standard	6141	Utility corridors shall not be developed for or used by motorized vehicles, except for administrative use or where authorized for maintenance of the corridor.
Guideline	6142	Special uses should generally not include developed recreation facilities or rights-of-way open to public motorized use in order to reduce disturbance to wildlife.
2800 – Minerals		
Standard	6143	Extra restrictions, such as timing of operations, may be necessary in this prescription to limit disturbance to wildlife populations and to provide the semi-primitive non-motorized recreation opportunity.
Standard	6144	Exploration and development of federal minerals is allowed but is included in the 40 percent disturbance restriction in Standard 6122, above.
Guideline	6145	During turkey and deer hunting season, motorized access to federal gas wells and pipelines should be avoided before 11 a.m. and after 3 p.m., except during construction phases or in out-of-the-ordinary

Management Direction for 6.1 – Wildlife Habitat Emphasis		
Type	**Number**	**Direction Description**
		maintenance situations.
7100 - Transportation System Planning		
Guideline	6147	Road densities and impacts should be minimized to reduce disturbance in the area. a) New road construction should not cause road density within the prescription area unit to exceed 1.0 mile per square mile for collector roads, or 2.5 miles per square mile for any combination of collector and local roads. b) New collector roads should generally be gated and maintained for recurring administrative use. c) New local roads should generally be closed between projects by physical barricades. Use should be intermittent. Public motorized use should generally not occur from April 15 to August 1 to reduce disturbance to wildlife. See also Guideline 6119 and Standard 6125.

Appendix C – References

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