

Wilderness Working Paper

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Introduction

The following section is provided as an introduction to the laws, regulations, and policies which guide the Forest Service management of Congressionally designated wilderness areas. Background information for all seven wildernesses and a description of alternatives, effects and cumulative effects will follow.

Wilderness policy directs the agency to consider the wilderness resource as the overriding value when a choice must be made between wilderness values and visitor or any other activity, in order to preserve wilderness.

Laws, Policy and Guidance that Affect the Analysis of NNIS in Wilderness

In this section, key portions of the laws, regulations, and policies that set the sideboards for NNIS management in wilderness. We have used these laws, regulations, and policies to focus our analysis.

The Wilderness Act and the Illinois Wilderness Act

The Wilderness Act of 1964 is the enabling legislation for the management of the National Wilderness Preservation System (NWPS). In 1990, the Illinois Wilderness Act designated seven areas of the Forest as units of the NWPS. They are: Garden of the God's, Lusk Creek, Bay Creek, Burden Falls, Bald Knob, Clear Springs, and Panther Den Wildernesses. There are about 28,000 acres of wilderness on the Forest, within the project area. Acreage for each wilderness is presented in Table 33 (??).

Within the Wilderness Act, there is language which both defines wilderness and describes how wilderness is to be managed. Section 2 (c) states,

“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which:

- (1) Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work being substantially unnoticeable;*
- (2) Has outstanding opportunities for solitude or a primitive and unconfined type of recreation;*
- (3) Has at least five thousand acres of land or is of sufficient size as to make practicable its*

extent consistent with the maintenance of primitive conditions.”

Special provisions are also reiterated in 36CFR 293.3:

“(a) To the extent not limited by the Wilderness Act, subsequent legislation establishing a particular unit, or the regulations in this part, the Chief, Forest Service, may prescribe measures necessary to control fire, insects, and disease and measures which may be used in emergencies involving the health and safety of persons or damage to property and may require permits for, or otherwise limit or regulate, any use of National Forest land, including, but not limited to, camping, campfires, and grazing of recreation livestock.”

Forest Service Policy

Wilderness management is reflected also in Forest Service policy in Forest Service Manual (FSM) 2320 and Forest Service Handbook 2309.

2320.3 - Policy

1. Where there are alternatives among management decisions, wilderness values shall dominate over all other considerations except where limited by the Wilderness Act, subsequent legislation, or regulations.
2. Manage the use of other resources in wilderness in a manner compatible with wilderness resource management objectives.

2320.2 - Objectives

2. Maintain wilderness in such a manner that ecosystems are unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces.

2320.5 - Definitions

10. Indigenous Species. Any species of flora or fauna that naturally occurs in a wilderness area and that was not introduced by man.
11. Native Species. Any species of flora or fauna that naturally occurs in the United States and that was not introduced by man.
12. Naturalized Species. Any non-indigenous species of flora or fauna that is close genetically or resembles an indigenous species and that has become established in the ecosystem as if it were an indigenous species.
13. Exotic Species. Any species that is not indigenous, native, or naturalized.

2323.04c – Regional Forester.

Unless specifically reserved to the President (FSM 2323.04a) or the Chief (FSM 2323.04b) or assigned to the Forest Supervisor (FSM 2323.04d) or the District Ranger (FSM 2323.04e), the Regional Forester is responsible for approving all measures that implement FSM direction on the use of other resources in wilderness. Specific responsibilities include but are not limited to:

9. Approving the use of pesticides within wilderness.

2323.51 – Objective.

Manage forest cover to retain the primeval character of the environment and to allow natural

Alternative 3 proposes an integrated approach to the treatment of NNIS with the use of natural weed killers, and/or hot foam alone, or in combination with other hand treatments.

None of the treatments proposed would include motorized use or mechanized transport within wilderness.

This paper will address the minimum requirements being proposed and will analyze the effects on wilderness character.

The concept of minimum requirements for the administration of wilderness is derived from Section 4(c) of the Wilderness Act of 1964 (please refer to the preceding page). The Act has multiple references to the concept of determining what (if anything) constitutes the minimum necessary action. Although not required by law, regulation or policy, a minimum requirements analysis process is recommended to determine if there is a need for action and to determine what method, tool, structure or installation is necessary in order to protect wilderness values (Forest Service, Arthur Carhart National Wilderness Training Center, 2005).

Wilderness Indicators

1. Untrammelled Condition

“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The Wilderness Act of 1964, Section 2c

“Untrammelled” is defined as unconfined or unhindered, and is a measure of the control or manipulation that modern human activities exert over the components or processes of ecological systems inside wilderness. The object of managing for an untrammelled condition is neither to stop ecological change nor to return an area to condition, but rather to let change progress to whatever outcome might occur unhindered by human influence (Landres *et al.* 2005). Some examples of management-related manipulation within wilderness includes actions such as igniting fire, mechanically reducing fuels, introducing plants or animals or applying herbicides and pesticides. An example of human manipulation that is not management-related would be the creation of multiple trails that negatively affect ecological processes.

It is recognized that in the short term, all actions diminish the untrammelled quality of wilderness - even though they are intended to restore natural conditions and support the concept of natural quality of wilderness. However, in the long term, these actions may eventually lead to reduced trammeling. The intent of monitoring is to track significant manipulations such as reducing fire-accumulated fuels over a large area and not track small-scale manipulations (Landres *et al.* 2005).

Non-native invasive species is also considered trammeling as they are introduced, in part, by past and present human activities. NNIS have the potential to damage the biological diversity

subsequently combined to develop an extensive network of travelways available for a variety of recreational activities.

Since 1990, there has been no road-building, timber-cutting or management of wildlife openings in wilderness. Direct management actions concentrated on discouraging motorized use, providing recreation access, and protecting natural areas.

Fire management policies in wilderness have also played a role in shaping natural processes. All wildfires were, and continue to be suppressed when taking place in wilderness. As identified in the 2010 Fire Management Plan, however, a variety of suppression tactics may be applied. Wildfire and prescribed fire have not played a role in wilderness for several decades and are unlikely to play a role in the near future. The use of fire for management of NNIS or for vegetation manipulation is not currently proposed in wilderness.

The greatest changes to the seven wildernesses since designation in 1990 have come from recreational use. Recreational uses in wilderness include horseback riding, hiking, hunting and fishing and occasional camping. Horseback riding escalated when private campgrounds were established in close proximity to Lusk Creek, Bay Creek, and Garden of the Gods Wildernesses in the mid- to late-1990's. Riding on system trails, old roads, and cross-country created new routes through wilderness and through natural areas, creating avenues for erosion and the introduction of NNIS. In 2006, a policy to restrict equestrians to system trails was included in the Land Management Plan. This policy was adopted in Lusk Creek, Bay Creek and Garden of the Gods Wildernesses as a result of a large-scale trails designation analysis. Cross country riding is still permitted in Burden Falls, Panther Den, Clear Springs and Bald Knob Wildernesses. Recreational use continues to contribute to the establishment and spread of NNIS throughout all seven wildernesses.

Wilderness-wide, the following activities and/or conditions are currently affecting, or have the potential to affect, natural processes:

- Soil and water resources are affected. Major sources of sediment on forest lands in the project area are likely the facilities associated with transportation systems, mainly unimproved roads and trails.
- Equestrian and hiker use of unimproved roads and trails exposes bare soil which can lead to accelerated erosion.
- New user-created trail routes are likely to continue to proliferate in the four wildernesses (Bald Knob, Clear Springs, Panther Den, and Burden Falls) without policies that restrict equestrians to system trails. These routes can lead to accelerated erosion.
- Existing trails with a steeper gradient have a greater erosion potential than trails with a lower gradient and steep trails have higher potential for erosion.
- Many of the trails and roads cross ephemeral, intermittent and perennial streams. These crossings are direct points of sediment delivery. Localized disturbance to banks and channel substrate can occur. Trail crossings at larger stream channels can cut the banks causing them to become unstable and erode.
- Under wet soil conditions trails are more vulnerable to rutting, compaction and erosions.

Table (3) Natural Areas in Wilderness. Updated 6/9/2010

Natural Area	Wilderness	Wilderness Acres	Total Acres
Garden of the Gods Ecological Area	Garden of the Gods	140	197
Caney Branch Ecological Area	Burden Falls	67	67
Lusk Creek Zoological Area	Lusk Creek	23 *	**
Lusk Creek North Ecological Area	Lusk Creek	3	3
Lusk Creek Canyon Ecological Area	Lusk Creek	204	204
Chimphila Site Botanical Area	Lusk Creek	2	2
East Fork Oxalis Botanical Area	Lusk Creek	2	2
Martha's Woods Ecological Area	Lusk Creek	43	43
Bald Knob Geologic Area**	Bald Knob	3	6
Hutchison Zoological Area**	Clear Springs	154	154
Clear Springs Geologic Area**	Clear Springs	1	12
Pine Hills Annex Ecological Area**	Clear Springs	9	9
LaRue-Pine Hills Research Natural Area**	Clear Springs	197	3342
Total		848	4041
* stream only			
** Fire Dependent			

Table (5) Other Priority NNIS in Wilderness

02.19. 2010	Garden of the Gods Wilderness	Lusk Creek Wilderness	Burden Falls Wilderness	Panther Den Wilderness	Bald Knob Wilderness	Clear Springs Wilderness	Total FS Wilderness NNIS Acres
AIAL (tree of heaven) <i>Allanthus altissima</i>						0.6	0.6
ELUM (autumn olive) <i>Elaeagnus umbellata</i>			1.79		1.67	2.51	5.97
LECU (sericea lespedeza) <i>Lespedeza cuneata</i>					0.46		0.46
LOJA (japanese honeysuckle) <i>Lonicera japonica</i>						1.17	1.17
LONIC (honeysuckle)					0.4	0.39	0.79
MIVI (nepalese browntop) <i>Microstegium vimineum</i>	7.43	160.91	36.89	8.05	28.63	19.84	261.75
ROMU (multiflora rose) <i>Rosa multiflora</i>					3.11	0.75	3.86
SCPH (tall fescue) <i>Schedonorus phoenix</i>						0.41	0.41
TOTAL	7.43	160.91	38.68	8.05	34.27	25.67	275.01

The total number of acres for all of the NNIS in all of the inventoried wildernesses includes 46 for the most highly invasive (top four priority species in Table #1) and 275 for the remaining NNIS with the majority of 262 acres attributed to Nepalese browntop.

The presence of NNIS is the result of past human actions as well as natural forces. Lack of treatment on adjacent public and private lands, seed transport via recreation users along trail and road corridors, and natural spread via wind and wildlife and along streams are all contributing factors. These plants have spread aggressively in other similar ecotypes.

Proposed Methods of Treatment of NNIS in, or adjacent to wilderness:

- **Manual** - (All Alternatives): Hand pulling, digging, torching, and removal of weeds would continue to be used for many small infestations where the method is effective. Torching includes the use of a propane torch. A metal frame backpack carries the propane, which is gravity-fed into a hose and nozzle.
- **Mechanical** - (All Alternatives): No mechanical means of treatment would be used in wilderness,
- **Chemical** –
 - Synthetic herbicide (Alternative 2) would be applied using injection, hand-pump backpacks, portable pressure driven sprayers, and cut and daub methods.
 - Natural chemicals (Alternative 3), such as a mixture of vinegar and clove would also be applied using injecting, hand-pump backpacks, and cut and daub methods.
- **Motorized** – (Alternative 3): Hot foam machine would be applied along roads adjacent to wilderness. Hot foam would be applied within wilderness boundaries to the extent the spray can reach from the nozzle. The Waipuna Hot Foam system delivers hot water with a foam surfactant to target weeds via a supply hose and treatment wand that would top-kill the plant. The machine would be pulled by a motorized pickup or tractor.

In all alternatives, treatment of the four highly aggressive NNIS would be treated anywhere they occur. In Alternatives 2 and 3, however, the other priority NNIS would be treated within a 100 ft or 300 ft corridor of streams, roads, and trails (Tables 7 and 8). Treatment would occur directly on the plant and would only extend beyond the 100ft zone if the plant population extended beyond. There would be no treatment past the 300 ft zone. Considering the current inventory of existing NNIS, treatment would not extend beyond a few hundred acres in any year.

Potential Treatment Zones

Table (7): Wilderness NNIS 100ft Treatment Zones of Streams, Roads, Trails & ROW

4.28.2010

Zone Priority* (only FS)-->	Stream (acres)	Road (acres)	Trail** (acres)	ROW (acres)	TOTAL (acres)
Bald Knob Wilderness	384	7.9	519.7		911.6
Bay Creek Wilderness	295.9	46.1	256.4		598.4
Burden Falls Wilderness	338.4	54.6	214.6		607.6
Clear Springs Wilderness	300.2	63.1	385.2		748.5
Garden of the Gods Wilderness	317.4	21.3	419.2		757.9
Lusk Creek Wilderness	441	47.1	1041.5		1529.6
Panther Den Wilderness	91.6	5.3	108.7		205.6
Total	2168.5	245.4	2945.3	0	5359.2

digging with asparagus knife or shovel would continue. The degree of hand treatments would vary slightly by alternative, however, treatment crews would be present in all alternatives and would have an adverse impact on the untrammelled quality.

Alternative 1

In this no-action alternative, the current estimated 320 inventoried acres of NNIS would be treated using methods of hand-pulling, torching, and digging with asparagus knife or shovel. It can be anticipated to miss critical times prior to the plant seeding or flowering to extract the plant and reduce rate of spread. It is also anticipated to miss some or all of the root with top killing, pulling or digging. Hand pulling NNIS would continue in this alternative. The presence and anticipated expansion of NNIS would have a direct negative effect on the untrammelled character. In response, frequent treatment by work crews would also have a direct effect on the untrammelled character of wilderness.

Alternative 2

This alternative proposes an integrated treatment approach for NNIS that would include hand, mechanical, and synthetic chemical (herbicide) treatments. There would be no restrictions on the use of hand tools for any NNIS anywhere they occur. Herbicide could be applied (by hand or stock) to the four priority NNIS (garlic mustard, Chinese yam, amur honeysuckle, and kudzu). For the remaining NNIS, herbicide could be applied (by hand or stock) directly on the NNIS within pathways of invasion. Herbicide application would be confined to stream and system and non-system road and trail corridors for 100 feet on either side. If NNIS is discovered within the treatment zone, and extends past 100 feet, treatment may occur up to 300 feet on either side.

The treatment zone tables 7 and 8 identify the 100 foot and 300 foot corridors for all streams, roads (adjacent to wilderness) and trails within wilderness. Since treatment would be applied by hand or stock and specifically on the NNIS plant or population, the number of actual treatment acres would be a minor portion of the acres shown in these tables. In order to limit the potential effect of herbicide treatments, no more than 500 acres in any watershed, and 3000 acres on the Forest would be treated each year.

The application of herbicide on NNIS is anticipated to kill the entire plant and root, thereby having a greater chance of control and possible eradication of the approximate 320 acres of NNIS, plus newly discovered species and populations. The presence of treatment crews and the action of treatment would be considered a trammeling of wilderness character. However, this alternative would have the least impact on trammeling in that the herbicide treatment would be the most effective in killing the non-native invasive plants and reducing or eliminating their spread. In addition, treatment with an effective herbicide would require less frequency of treatment by work crews than in the other alternatives.

Current management including maintenance of system trails and stock confinement areas and roads to private in-holdings (in Lusk Creek) will continue. New trail designation and construction will continue to add gravel and rock to stabilize the trail tread, and rustic signs and markers for direction and visitors safety. Carsonite and painted boundaries will be maintained around natural areas where equestrian use is excluded. Authorized and unauthorized motorized access to private land in-holdings would continue in Lusk Creek. Recreational use in all seven wildernesses will continue as will cross country use by equestrians in Burden Falls, Bald Knob, Clear Springs, and Panther Den. The presence of roads and trails are obvious signs of human manipulation of the environment and have an adverse affect on the natural condition of wilderness. Eroded routes would continue to widen and adversely affect natural conditions and processes.

The introduction of new populations of NNIS would adversely affect the natural condition in wilderness as it crowds out native plants and encroaches into natural areas. The introduction of NNIS will continue throughout all seven wildernesses by recreational uses on foot. In Burden Falls, Bald Knob, Clear Springs and Panther Den equestrians would not be restricted to system trails, creating new routes where NNIS could become established having an adverse effect on the natural condition in wilderness.

In all alternatives, current methods of NNIS treatment, including hand-pulling, torching, and digging with asparagus knife or shovel would continue. The degree of hand treatments would vary by alternative.

Alternative 1

In this no-action alternative, some species of NNIS would continue to be treated using methods of hand-pulling, torching, and digging with asparagus knife or shovel. It can be anticipated to miss critical times prior to the plant seeding or flowering to extract the plant. It is also anticipated to miss some or all of the root with top killing, pulling or digging. The Hand pulling NNIS would continue in this alternative. The presence of the approximate 320 acres of NNIS, and anticipated expansion, would have a direct negative effect on the natural condition of wilderness as populations would continue to expand. Of all alternatives, this one would have the greatest impact on the natural condition of wilderness as populations of NNIS continue to expand, crowding out native plants and reducing overall plant diversity.

Alternative 2

This alternative proposes an integrated treatment approach for NNIS that would include hand, mechanical, and synthetic chemical (herbicide) treatments. Within wilderness, the initial treatment used would be herbicide. Subsequent monitoring for NNIS could result in additional treatment using herbicide, and/or hand-pulling, and/or torching, and/or digging. To kill the four highly aggressive NNIS: garlic mustard, Chinese yam, amur honeysuckle, and kudzu, the application of herbicide would occur anywhere in wilderness. To kill the remaining target NNIS, herbicide would be confined to stream and system and non-system road and trail corridors for 100 feet on either side. If NNIS is discovered within the treatment zone, and extends past 100 feet, treatment may occur up to 300 feet on either side. If new non-system

up to 300 feet on either side. If new non-system routes are created in Burden Falls, Panther Den, Bald Knob and Clear Springs the areas of treatment could grow.

This alternative would require frequent treatments to top-treat NNIS. Treatment would be applied to all 320 acres of inventoried NNIS plus expansions. It is not likely to completely kill the plants, unless timed prior to seeding for annuals, such as Nepalese Browntop, and biennials, such as garlic mustard. Roots of perennials would remain alive and would be likely to re-sprout annually. The effect of more frequent treatments would reduce the rate of spread, but would not eradicate the NNIS populations, resulting in an adverse effect on the natural condition.

Alternative 3 would have a more adverse effect on the natural condition of wilderness than Alternative 2 because the natural weed killer would not be as effective in killing the entire plant as herbicide, allowing NNIS to continue to spread. Alternative three would be more effective in reducing rate of spread of NNIS than Alternative 1, however, because of the ability to treat larger areas with natural weed killers and hot foam.

Cumulative Effects on Wilderness Character

Cumulative Effects

Effects

The spatial boundary for wilderness includes the proclamation boundary of the Shawnee NF and Crab Orchard Wilderness, adjacent to Panther Den Wilderness. This boundary was selected because management actions, natural process, and recreational activities which occur on the Forest are confined to the Forest and areas immediately adjacent to it.

The temporal boundary is estimated around the 1930's when NNIS were commonly planted as soil stabilizers and as food for wildlife and domestic animals. The temporal boundary extends to the reasonably foreseeable future around 2020, or when the next land management plan is anticipated. Ten years in the future is long enough to accurately gauge the management effects.

Past, present, and reasonably foreseeable future actions include those listed at the beginning of Chapter 3. There will be no differences between the Action Alternatives and the No Action Alternative for the following actions when determining cumulative effects: Agriculture (cultivated-row-cropping), Agriculture (pasturage), Wildfires, Timber Harvest/Firewood Cutting, Timber Stand Improvement, ATV Use, Tree Planting, Utility Right of Way Maintenance, Special-Use Permits (telephone, electric, water and driveways), Openland Management, and Residential Development. None of these activities occur within wilderness, or occur only rarely (ATV use and firewood cutting) and would not result in environmental effects.

and sometimes includes mowing. Alternative 2, integrated NNIS treatment using herbicides in road corridors could reduce the amount of nnis available for transport into wilderness through corridors and on Coyote Road (1.3 miles in Lusk Creek Wilderness), having a positive cumulative effect on the natural condition.

Alternative 1, in combination with road maintenance, would have a negative cumulative effect on the natural condition of wilderness as only hand treatment would be used to control nnis. Hand treatment would be ineffective in the reduction, control, or spread of nnis.

Alternative 3, in combination with road maintenance, may also have a slight negative cumulative effect on the natural condition of wilderness. NNIS treatment by hand, hot foam, and/or the use of natural weed killers would be effective in controlling annuals, such as Nepalese browntop and bienneials, such as garlic mustard, but would require frequent treatments and accurate seasonal timing. Natural weed killers and hot foam would top kill the plant, but leave the root to re-sprout, thereby reducing effectiveness on perennial nnis.

All three alternatives would have a negative effect on the untrammelled character as they would require the presence of crews and treatments.

Trail Construction, Reconstruction, and Maintenance: Trail construction or maintenance will continue on 75 miles of system trails within wilderness and on many miles of trail leading to wilderness. Trail corridors serve as the primary corridors for the transport of NNIS by humans and animals. Maintenance and/or construction activities would include cutting grass, brush and small trees within the trail corridor, moving soil and rock in order to shape the trail tread, constructing stock confinement areas, bridges, hitching posts, turn pikes, and hauling rock or other materials to the work site on foot, or sled, or using stock animals. This proposed action is largely dependent on the locations of travelways in wilderness and as the most likely points of establishment for NNIS. NNIS are also transported by trail crews, stock animals, and tools, causing re-occurrence. A decision to implement Alternative 2 would reduce the quantity of NNIS available for spread, having a positive cumulative effect on the natural condition in wilderness, when combined with trail construction, re-construction and maintenance activities.

In contrast, Alternatives 1 and 3 would reduce the rate of spread, but would not completely control or eradicate NNIS, possibly resulting in a negative effect on the natural condition of wilderness.

All three alternatives would have a negative cumulative effect on the untrammelled character in wilderness since they all would require some aspect of treatment in addition to trail management actions.

Non-System Trails: Past and present uses and management activities in wilderness have created user-created travel routes. Past and present uses include the presence of roads and trails at the time of designation, and new travel routes established as a result