ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEET

Invasive Species Treatment and Control

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– The Wilderness Act, 1964

Shawnee National Forest
August 10, 2010

Methods of Treatment:
Current Methods of Treating NNIS include hand-pulling, digging and torching. Torching includes the use of a propane torch. A metal-frame backpack carries the propane, which is gravity-fed into a hose and nozzle, held by the applicant.

Table 3. Current Non-native Invasive Species Control Methods in Wilderness

NNIS	Treatment
ALPE4 (garlic mustard)	hand-pulling, torching, grub with asparagus knife[1]
DIOP (Chinese yam)	hand-pulling, torching, grub with asparagus knife
LOMA6 (amur honeysuckle)	cut then grub with shovel[2]
AIAL (tree of heaven)	cut then grub with shovel
ELUM (autumn olive)	cut then grub with shovel
LECU (sericea lespedeza)	pulling, cutting and grub with shovel
LOJA (japanese honeysuckle)	torching, cutting and grub with asparagus knife
LONIC (honeysuckle)	torching, cutting and grub with shovel
MIVI (nepalese browntop)	pulling, torching
ROMU (multiflora rose)	cut then grub with shovel
SCPH (tall fescue)	pulling, cutting and grub with shovel

The establishment and spread of non-native invasive species is the result of past human actions as well as natural forces. Invasives are transported by humans, animals, water and wind along streams, trails and road corridors and from adjacent private and public lands. Lack of effective treatment has increased their establishment, spread and population size. While the tables above are known inventories of totals, they do not necessarily represent contiguous acres, nor do they represent all invasives present in wilderness. Some are widespread and occur as individuals or in small clumps, making detection and treatment more difficult.

The Forest has been treating these species in wilderness with various manual methods since 2001, beginning with hand-pulling garlic mustard. Individual plant-torching of Chinese yam began in 2002. Current manual methods of treatment seem to reduce the rate of spread, but do not control spread. Grubbing must extract the entire root to prevent re-sprouting. Grubbing also stirs up the topsoil leaving it exposed for new seed establishment. An asparagus knife can be used to extract plants with shallow root systems, although this is not commonly employed. A shovel or other root-grubber could disturb the root system below the plow-line, but would need Heritage Resource clearance prior to employment, if on level ground. Root-extraction on slopes is allowed regardless of the hand-tool used. Pulling and torching top-kill the plant, which may be effective against annuals like Nepalese browntop (especially if treated prior to seeding) and garlic mustard, a biennial. Manual methods, however, have not been an effective eradication measure because of the timing of treatment, the expanse of acreage, and the frequency of treatment needed. Torching kills the top of the plant, but not the root, leaving the plant to resprout.

An integrated approach to invasives treatment is being considered that would combine manual methods and herbicide, or natural weed-killer and/or hot foam methods within wilderness. None

[1] Asparagus knife would be effective in shallow root systems, extend up to 4 inches, and would not reach the plow line.
[2] Shovel or another hand tool would be needed on root systems that could extend 6 inches or below the surface. These tools could disturb below the plow line and would require heritage clearance prior to use.

Wilderness Act of 1964:
Section 2 (a) Wilderness "shall be administered...in such manner as will leave them unimpaired for future use as wilderness, and so as to provide for the protection of these areas [and] the preservation of their wilderness character..."

Section 2 (c) "An area of wilderness is...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 substantially unnoticeable..."

Section 4 (c) Prohibition of certain uses "...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

There are provisions in Section 4(d) of the Wilderness Act of 1964 that allow the control of fire, insects and disease, although the treatment of non-native invasive species is not specifically listed.

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: X No: Not Applicable:

Explain: The Noxious Weeds Act of 1974 designates the Forest Service the lead agency for noxious weed coordination within USDA and requires the establishment of integrated management.

Executive Order 13112 of February 3, 1999, "Invasive Species," requires federal agencies to detect non-native invasive species and respond quickly to infestations and provide for the restoration of native species and habitat.

Code of Federal Regulations:
In carrying out the purposes for which wilderness was established, 36 CFR 293.2 states:
"(a) Natural ecological succession will be allowed to operate freely to the extent feasible.
(b) Wilderness will be made available for human use to the optimum 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."

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.

Forest Service Guidance and Tools:
Ten Year Wilderness Stewardship Challenge, Element 2 – Invasive Species:

Non-native invasive species treatment is the second of ten key elements to achieve a minimum stewardship level of wilderness that includes the following definitions and goals to achieve higher levels through successful treatment of non-native invasive species.

Key Definitions:

"Non-native invasive plants": A plant, including its seeds, spores or other biological material that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm.

"Non-native invasive species management plan": An integrated plan developed to address the control or eradication of non-native, invasive plants and/or animals on a national forest or other land unit.

"Successfully treated": The treatment was part of a Non-Native Invasive Species management plan and the treatment met the objectives in the plan, whether it be eradication or control. This includes direct management actions in the field.

Shawnee National Forest LRMP, 2006:

FW 21.1: Pesticides and Biological Treatment: The use of pesticides and biological treatments to meet management objectives is allowed following appropriate environmental considerations.

Other NNIS Guidance:
River-to-River Cooperative Weed Management Area (http://www.rtrcwma.org/) prints a newsletter, annual report and guide and offers workshops and other training in the identification and eradication of non-native invasive species. This is a partnership of 12 agencies in southern Illinois for the purpose of cooperatively addressing the short- and long-term effects of non-native invasive plants in southern Illinois.

House of Representatives Congressional Report to accompany H.R. 5428, 1990 by Mr. Udall and the Committee on Interior and Insular Affairs: The report encourages the Forest Service to maintain native plant communities in wilderness and control non-native invasive species (Japanese honeysuckle) through the use of prescribed fire, herbicide (glyphosphate), and control of equestrian use.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: Untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Table 4. Designated Natural Areas within Wildernesses.

Natural Area (6/2009)	Wilderness	Acres in Wilderness	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 *	23*
Lusk Creek North Ecological Area	Lusk Creek	3	3
Lusk Creek Canyon Ecological Area	Lusk Creek	204	204
Chimaphila 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	4064
* stream only			
** Fire Dependent[3]			

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes: X** No: Not Applicable:

Explain: The presence and spread of non-native invasive species in wilderness will degrade the quality of the recreational experience in wilderness as native species are replaced. This is due to the changes in vegetation and effects on scenery, native habitat and biological diversity.

Scenic: **Yes: X** No: Not Applicable:

Explain: Non-native invasive species lower the scenic quality of an area. A monoculture of invasive species differs from a natural and diverse forest habitat and competes with native species and adversely impacts designated natural areas.

Scientific: **Yes: X** No: Not Applicable:

Explain: Non-native invasive species alter ecosystem species diversity and distribution. This change affects existing and future studies of the natural conditions and processes, especially within natural areas.

Education: **Yes: X** No: Not Applicable:

Explain: There is an educational value to treating non-native invasive species in wilderness as it promotes and highlights the purposes described in sections 2 (a) and (c) for which wilderness was established. The spread of invasive species and how that affects wilderness and other natural-resource values is a substantial topic in the delivery of over 20 interpretive programs per year. Outreach includes several private horse campgrounds, the annual Nine-Day Camping and Riding event with over 3,000 horseback riders, and several school and campground programs.

[3] Fire-dependent natural areas depend on fire to maintain native plant species and communities.

- Ensuring direct treatment to non-native invasive plants and avoiding neighboring vegetation to the extent possible.
- Monitoring to ensure rapid response on new or re-infestations of non-native invasive species, as well as the effectiveness of treatment.

Our invasive species prevention and education program includes our participation in the River-to-River Cooperative Weed Management Area (CWMA) partnership. This is a group effort of 12 federal and state agencies, organizations and universities whose goal is the coordination of efforts and programs for addressing the threat of invasive plants in southern Illinois. The CWMA was formally established in 2006 and addresses invasive plant species through collaborative projects and activities focused on:

Education and Public Awareness
Early Detection and Rapid Response
Prevention
Control and Management
Research

Alternative 1: No Action
This alternative would continue utilizing methods of manual treatment, such as hand-pulling, torching and grubbing any non-native invasive species, anywhere they occur.

Manual treatments would occur prior to seeding of annuals and biennials to maximize effectiveness. Manual treatments are ineffective on Nepalese browntop due to the expansiveness of the plant population. Manual treatments are also ineffective on perennials (most invasives) due to their strong root systems that will re-sprout and continue to seed and spread. Manual treatments may slow the spread of non-native invasive species, but will be ineffective in control. In addition, they would require frequent treatments by crews and specific seasonal timing for various species of NNIS prior to seeding.

Effects:
Untrammeled Character: Manual treatments of invasives would ineffectively eradicate the species and, so, the trammeling caused by the presence of invasives would continue.

Undeveloped Character: There would be no effect on the undeveloped nature of wilderness character because there is no structural development proposed and no use of motorized equipment.

Natural Character: Manual treatments of invasives would not provide control or eradication. Native vegetation and natural areas would continue to be affected by the encroachment of non-native invasive species. Plant diversity would also continue to decline if allowed to spread.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation: There would be a presence of non-native invasive species treatment crews in addition to crews and volunteers performing other work in wilderness as well as the presence of other visitors. Frequent treatments would be required with this alternative. The presence of treatment crews, however, would be negligible when taking into consideration all working crews, volunteers and recreationists. There would be no effect on primitive and unconfined type of recreation.

Heritage and Cultural Resources:
Historical homesteads with foundations remaining, wells or cisterns, and vegetation of planted lilies and other flowers are present in all 7 wildernesses. Heritage sites would be avoided when grubbing roots using shovels or tools that would disturb below the plow line.

The following herbicides[7] would be used to treat invasive plants: triclopyr, clopyralid, glyphosate, sethoxydim, and/or picloram. These herbicides are commonly used and should provide effective treatment.

Treatment would be applied directly to the invasives. Current inventory shows about 320 acres of non-native invasive species in all the wildernesses. In order to limit the potential effect of herbicide treatments and to quantify the effects for our analysis, we would annually treat no more than 500 acres in any watershed (See Table 6) and no more than 3,000 acres Forest-wide. Appendix A identifies watersheds and acres for each wilderness.

The application of herbicides would be by backpack hand-sprayers. Herbicide would be applied to individual plants. Non-mechanical transport methods (foot and stock travel) would be used to move herbicide, people, and supplies to treatment areas and backpack pumps would be used for application of the herbicide.

Table 6. Watersheds of Wildernesses

Watershed	Wilderness Acres
Black Branch-Eagle Creek	1728.3
Grassy Creek	838.6
Hayes Creek	3.7
Hutchins Creek	5914.9
Little Bay Creek-Bay Creek	2516
Little Eagle Creek	617.8
Little Lusk Creek-Lusk Creek	6288.4
Little Saline River	3854.1
Pinhook Creek-Big Grand Pierre Creek	1650.4
Pond Creek	82.1
Running Lake Ditch	0.4
Seminary Fork-Clear Creek	3408.1
Town Creek-Big Muddy River	1232.5
Total	**28,135.3**

Effects:
Untrammeled Character: Non-native invasive species treatment using integrated herbicide and/or manual methods would more effectively control the invasives and, so, enhance the untrammeled quality of wilderness.

Undeveloped Character: There would be no effect on the undeveloped quality of wilderness character because there would be no structural development and no use of motorized equipment.

Natural Character: Effective invasives treatment using integrated herbicide and manual methods would enhance the natural quality by restoring native vegetation and reducing the influence of non-native species on all components of the wilderness resource. Non-native invasive species would be treated directly when discovered. Visitors would experience a more natural environment, closer to the intent of wilderness.
Outstanding opportunities for solitude or a primitive and unconfined type of recreation: There would be a presence of non-native invasive species treatment crews in addition to crews and

[7] See NNIS EA Table 2 for a description of each herbicide.

traps the steam, giving it time to "cook" or "blanch" the vegetation. This causes a cellular collapse of the treated aboveground vegetation.

Both of these methods top-kill the sprayed plant, so could effectively control annual plants, such as Nepalese browntop, and biennial plants, such as garlic mustard. All three methods would be ineffective for the majority of invasives, which are perennial plants; however, they could reduce the rate of spread.

Motorized use would be restricted to roads adjacent to wilderness. There would be no mechanical transport of materials or supplies.

Effects:
Untrammeled Character: Non-native invasive species treatments using natural weed-killers or hot-foam or manual methods would ineffectively eradicate the species and, so, the trammeling caused by the presence of invasives would continue.

Undeveloped Character: There would be no effect on the undeveloped quality of wilderness character because there are no structural developments proposed or use of motorized equipment within wilderness.

Natural Character: Efficient use of natural weed killers and hot foam in addition to hand treatments may effectively control annual and biennial plants, such as Nepalese browntop and garlic mustard. Perennial invasives would continue to spread and have an adverse effect on the natural character.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation: There would be a presence of non-native invasive species treatment crews in addition to crews and volunteers performing other work in wilderness as well as other recreationists. Perennial invasives would continue to expand and become established in new places, requiring greater frequency of treatment over longer periods of time. In addition, noise from the diesel-powered foam machine boiler may contribute to the noise already present from vehicles on adjacent roads. However, when considering the presence of other working crews, volunteers and recreationists as well as existing motorized noise from vehicles, this alternative would have a negligible effect on solitude. Primitive and unconfined type of recreation would not be affected.

Heritage and Cultural Resources: Historical homesteads with foundations remaining, wells or cisterns, and vegetation of planted lilies and other flowers are present in all the wildernesses. Heritage resources would not generally be threatened by these treatment methods. Heritage sites would be avoided when grubbing roots.

Maintaining Traditional Skills: This option helps maintain skills for use of traditional tools (travel by foot and stock).

Special Provisions: None.

Safety of Visitors, Personnel, and Contractors: There would be a risk to crews from working with high concentrations of vinegar and clove oil, tools and stock, and from travelling over rugged terrain. The risk of severe injury would be less than alternatives that involve herbicide; however, the frequency of treatments would be increased. Effects on visitors could be minimized by publicizing the areas and times of treatment.
Economic and Time Constraints: Implementing the manual treatments and use of natural weed-killers would increase the project time needed and may be less cost-effective than alternatives that include herbicide treatment. Manual treatments alone are less effective than the use of herbicides or natural weed-killers and would require repeated treatments. Manual treatments

implemented since 2001 and have been shown to be ineffective as a means for control. The use of herbicides on nearby state and private lands, in conjunction with prescribed fire and mechanical methods has been successful in treating many of the target invasives proposed in this analysis.

Public input from the state, local county governments and adjacent landowners are in favor of aggressive treatment of non-native invasive species using herbicides on the national forest.

Monitoring and reporting requirements: Monitoring of all treatment areas will be conducted to determine effectiveness and minimize future treatments.

Check any Wilderness Act Section 4(c) uses approved in this alternative: (none)

- ☐ mechanical transport
- ☐ motorized equipment
- ☐ motor vehicles
- ☐ motorboats
- ☐ landing of aircraft
- ☐ temporary road
- ☐ structure or installation

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:	/s/ Pat York	Pat York	Recreation Program Manager	8/10/ 2010
Recommended for approval:	/s/ Cathy Y. Slover	Cathy Y. Slover	Recreation, Engineering, and Lands Staff Officer	08/16/ 2010
Recommended for approval:	/s/ Richard Blume-Weaver	Richard Blume-Weaver	Planning and Resources Staff Officer	08/17/ 2010
Recommended for approval	/s/ Hurston A. Nicholas	Hurston A. Nicholas	Forest Supervisor	08/17/ 2010
Approved:		Kent P. Connaughton	Regional Forester	