

2026 NNIPS Operating Plan

Land Between the Lakes National Recreation Area



Plan Description

In connection to, and compliance with the Land Between the Lakes National Recreation Area (NRA) Non-Native Invasive Plant Species Environmental Assessment (EA), this 2026 Annual Operating Plan has been developed. The purpose of this document is to provide notification and details to the public of specific projects underway for the year 2026. The projects outlined in this document include:

- Smith Timber Sale
- Crossroads Prescribed Fire (Units 6, 7, & 8)
- Area 13 in the Southern Tornado Corridor
- Moss Creek Kudzu
- Aquatic Weed Control
- Heritage Weed Control
- Murray State University Weed Control
- Openlands Weed Treatments

Methods of treatment will vary by project; however, the most typical treatments will include the use of herbicides, mastication, mowing, cutting, or fire. The intent of the EA is to follow an integrated, diverse, and adaptive approach for the removal of non-native invasive plant species. In some cases, multiple treatments may be proposed in one project area. Regarding the use of any chemicals, the user will always follow the manufacturer's labelled instructions for mixing concentrations and application rates. Maps included in this document will display information ranging from closeup views of project sites to area-wide views due simply to the scale of locations. The final feature of this document includes some, but not all, mitigation measures. Many mitigation measures are standardized in various regulations, laws, or the NRA's Land and Resource Management Plan, 2004, therefore there was no need to re-state "common" mitigation. Should any conditions on the ground be determined which force the project out of legal compliance, staff will revisit to discuss the best path forward.

Planned Projects

Timber

Smith Project Area

The Smith project area is located within Lyon County portion of Land Between the Lakes. The project area is in timber compartment 49 along and between roads 114 and 132. Activities to occur within the project area are as follows: commercial harvest (timber sale), prescribed fire, herbicide treatments, cut and leave thinning, mastication and planting. Roads that will be used are 114, 307, 116, 130, 306, 308, 132, and 309.

Commercial Harvest

The timber sale will be targeting non-native loblolly pine for removal using commercial harvesting. There will be approximately 373 acres of harvesting of loblolly pine in approximately 34 stands. Once the harvesting is completed there will be follow-up treatments of prescribed burning and herbicide application to remove loblolly pine regeneration. The goal is to achieve natural desirable oak/hickory

regeneration, but if adequate stocking is not met in 3 years, site preparation will occur, and oaks will be planted within the harvested areas.

Cut and leave thinning

The project areas also includes cut and leave thinning in patches of non-merchantable size loblolly pine regeneration. There will also be cut and leave treatments of merchantable size loblolly pine in areas not large enough for a commercial timber sale. Cut and leave thinning may also occur within streamside management zones, along the lake shore, heritage sites and cemeteries.

Herbicide treatment

Herbicide treatments will occur in harvested areas by targeting NNIPS species in such as loblolly pine to control its regeneration. The project area will also include the Newby Cemetery and treatment of the Kudzu encroaching upon the cemetery and into the forest.

Prescribed Fire

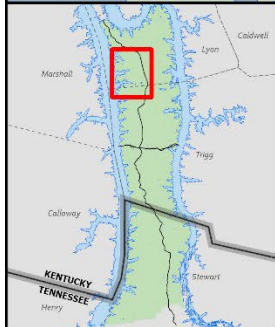
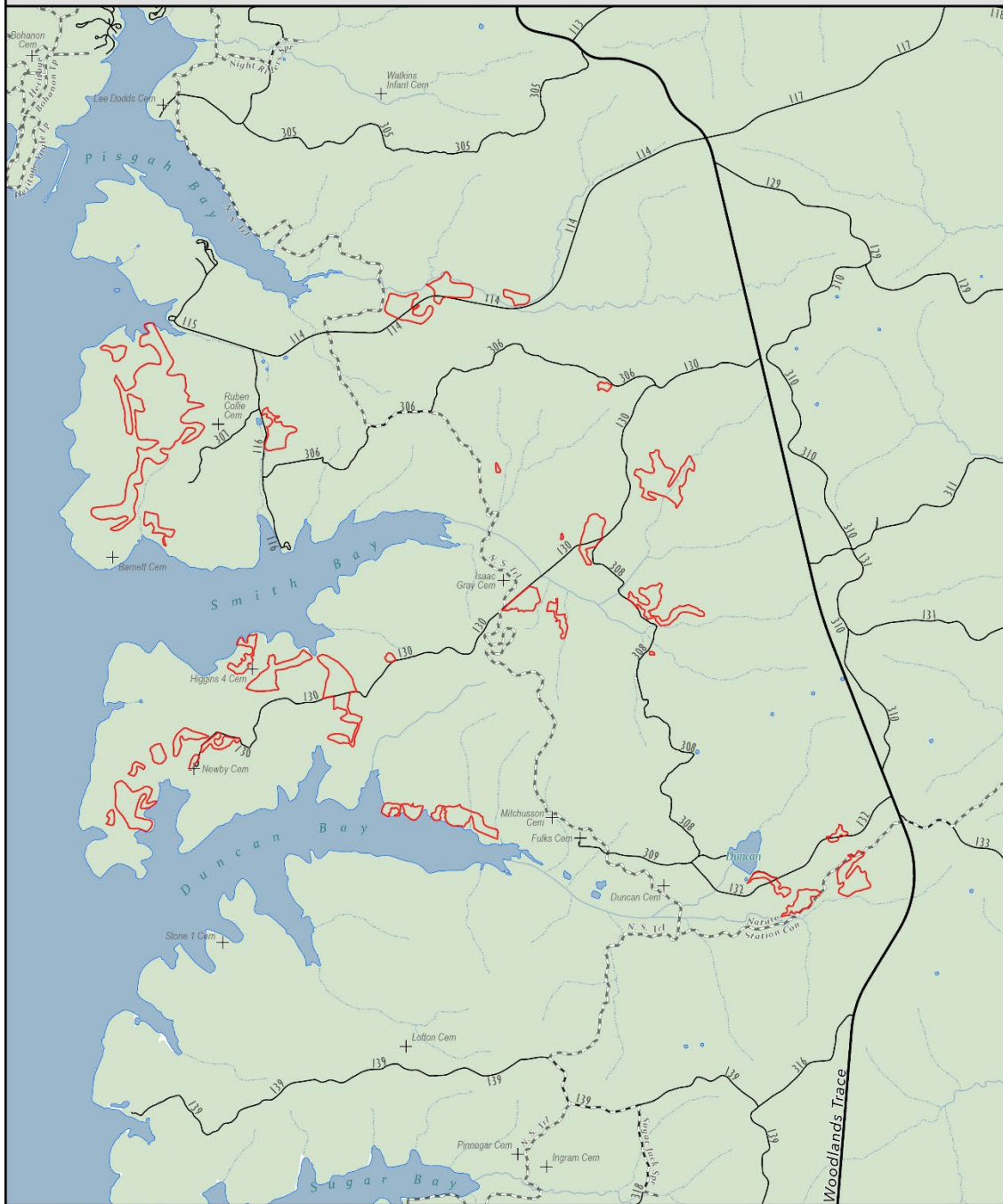
Prescribed fire will be used within the project area to help control the occurrence of loblolly pine regeneration, kudzu and other NNIPS. Prescribed fire may also be used for site preparation for planting if adequate stocking of natural desirable regeneration is not occurring.

Table of treatments and acreage

Stand	Acreage	Commercial harvest
1	9.2	Loblolly removal
2	11.9	Loblolly removal
3	15.9	Loblolly removal
4	4.8	Loblolly removal
5	15.0	Loblolly removal
6	7.6	Loblolly removal
7	25.7	Loblolly removal
8	26.1	Loblolly removal
9	1.3	Loblolly removal
10	7.7	Loblolly removal
11	15	Loblolly removal
12	6.9	Loblolly removal
13	107.7	Loblolly removal
14	4	Loblolly removal
15	5.9	Loblolly removal
16	11.5	Loblolly removal
17	19.7	Loblolly removal
18	1.6	Loblolly removal
19	1.9	Loblolly removal
20	3.9	Loblolly removal
21	6.1	Loblolly removal
22	1.5	Loblolly removal
23	5.3	Loblolly removal
24	0.3	Loblolly removal
25	0.6	Loblolly removal

26	1.6	Loblolly removal
27	14.2	Loblolly removal
28	12.3	Loblolly removal
29	4.2	Loblolly removal
30	0.3	Loblolly removal
31	3.9	Loblolly removal
32	14.3	Loblolly removal
33	2.7	Loblolly removal
34	5.2	Loblolly removal

Smith Bay Loblolly Pine Removal Area



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Legend

- Loblolly Timber Sale
- Cemetery
- Road
- Perennial stream
- Intermittent stream

Scale: 1:30,000
 1 in = 0.47 mi = 2,500 ft
 NAD 1983 UTM Zone 16N

Prescribed Fire

The Crossroads tornado damage project area is located within the Lyon county Kentucky portion of Land Between the Lakes. The activity to occur is prescribed burning in units 6, 7 and 8 of the crossroads project area. Burn units will utilize existing control lines for the majority of the units. Some mechanical line will be utilized through the tornado path area as shown on the attached map. There will also be leaf blower line utilized for units 7 and 8. Prescribed burning is being used to help control Loblolly pine that has mature stands inside the units as well as natural regeneration spreading in the units particularly in the path of the December 2021 tornado. Princess tree, Multiflora Rose, and Autumn Olive will also be targeted by use of prescribed burning in these units. Heritage sites and areas of cultural concern will be excluded from the burn area in consultation with the heritage program. The burn units cover more area than just where NNIPS are located so that less new control lines have to be constructed and to minimize holding issues to the best extent possible.

Unit 6 is 645 acres and will utilize FS Roads 112, 124, and 117 as control lines. Additional control line will be existing openlands access roads and mechanical line between roads 117 and 112 on the south end of the unit.

Unit 7 is 1136 acres and will utilize FS Roads 123, 117, 122, and 415 as control lines with additional leaf blower control line from the end of FS Road 415 to Lake Barkley. Unit 7 contains approximately 140 acres of core area in the middle of the unit directly in the tornado damage path with Loblolly pine regeneration occurring. (See map showing core area)

Unit 8 is 1017 acres and will utilize FS Roads 122, and 415 as control lines as well as the same leaf blower line as unit 7 from the end of FS Road 415 to Lake Barkley.

Area 13 tornado damage project area

The Area 13 tornado damage project area is located in the Stewart County Tennessee portion of land Between the Lakes. The activity to occur is prescribed burning in unit 6 of approximately 1635 acres. Burn units will utilize existing control lines for the majority of the unit. Some mechanical line will be utilized as shown on the attached map. There will also be some leaf blower line utilized to exclude core area near the southeast corner of the unit. Prescribed burning is being used to help control Loblolly pine that has mature stands inside the units as well as natural regeneration spreading in the unit particularly in the path of the December 2021 tornado. Princess tree, Multiflora Rose, and Autumn Olive will also be targeted by use of prescribed burning in the unit. Heritage sites and areas of cultural concern will be excluded from the burn area in consultation with the heritage program. The burn unit covers more area than just where NNIPS are located so that less new control lines have to be constructed and to minimize holding issues to the best extent possible.

Unit 6 will utilize FS Road 388, The Trace, the North South trail/connector trail, openlands access roads and mechanical line from the end of FS road 388 to the north south trail as well as mixed mechanical and leaf blower line between the North South connector trail and The Trace. Mechanized equipment may be used on the trails to mitigate areas of heavy fuel loading as needed (Control lines and type shown on attached map)

Moss Creek Kudzu project area

The Moss Creek Kudzu project area is located in the Lyon County Kentucky portion of Land Between the Lakes. The activity to occur is prescribed burning. The unit is approximately 118 acres. Control lines will be FS Roads 100 (The Trace), 106, and 107. Prescribed burning will be the initial treatment for the project and implemented as needed after initial treatment in conjunction with other kudzu control methods which can include, mechanical, herbicide, and grazing. The goal is to kill kudzu plants and reduce the seedbank over time.

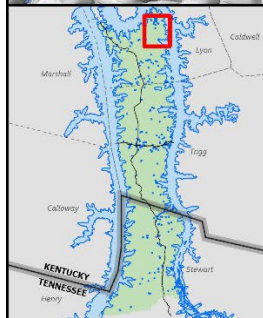
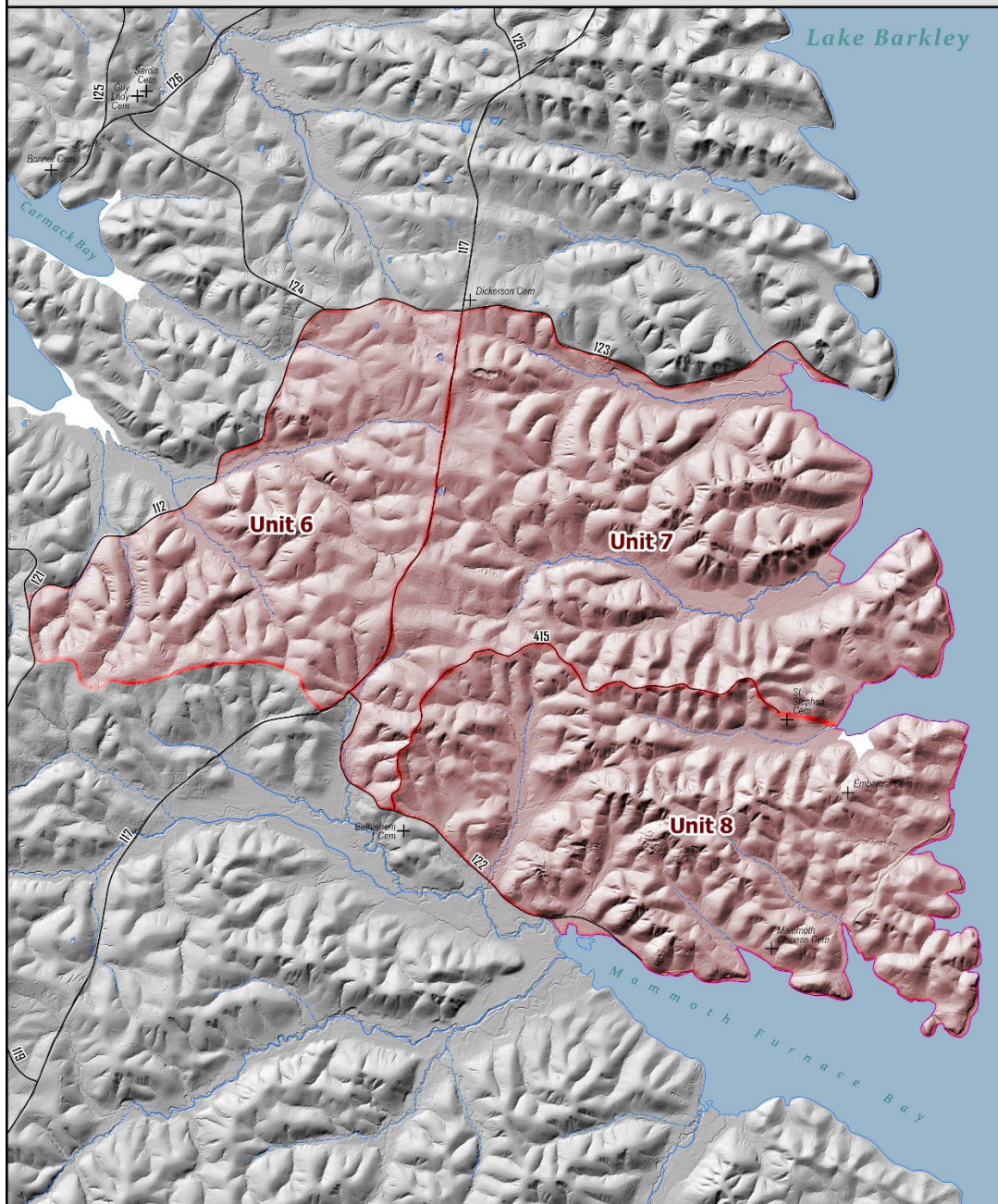
Loblolly regeneration Crossroads unit 6



Loblolly regeneration Crossroads unit 7



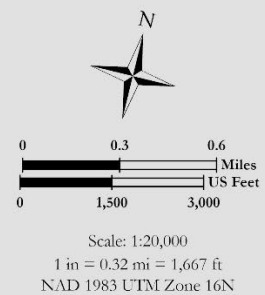
Crossroads Prescribed Fire Units 6, 7, 8



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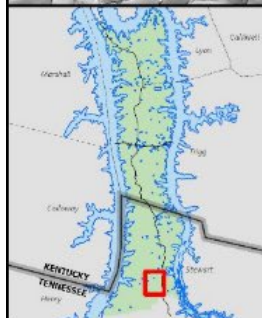
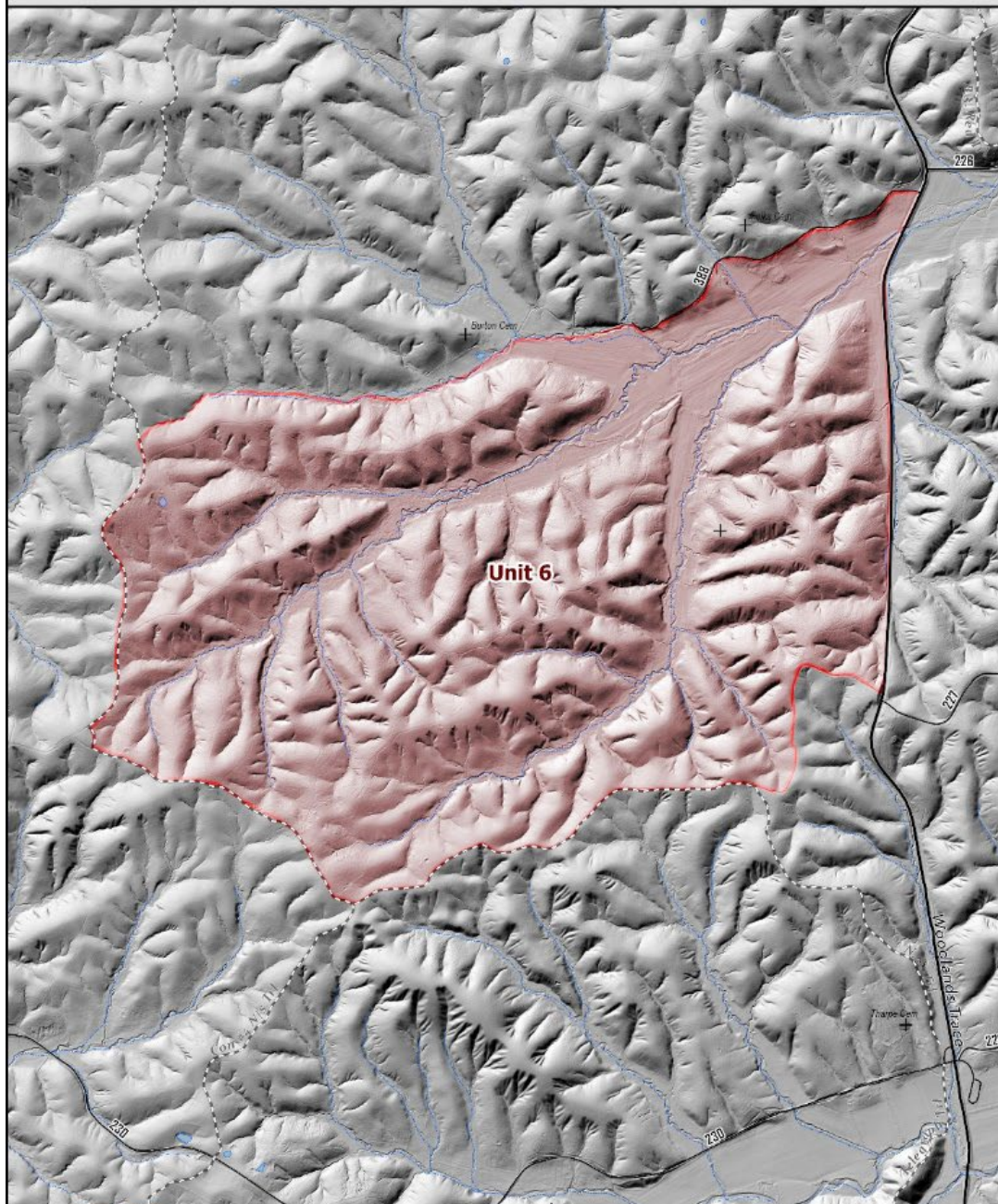
Legend

- RX Fire Unit
- Road
- Trail
- Cemetery
- Perennial stream
- Intermittent stream



Created on 3/23/2026 by EBarr.

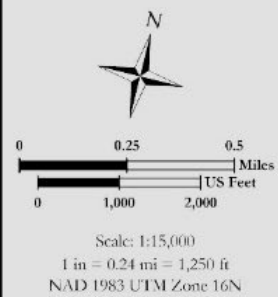
Violet Prescribed Fire Unit 6



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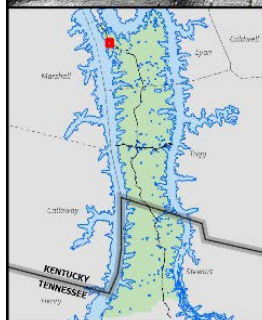
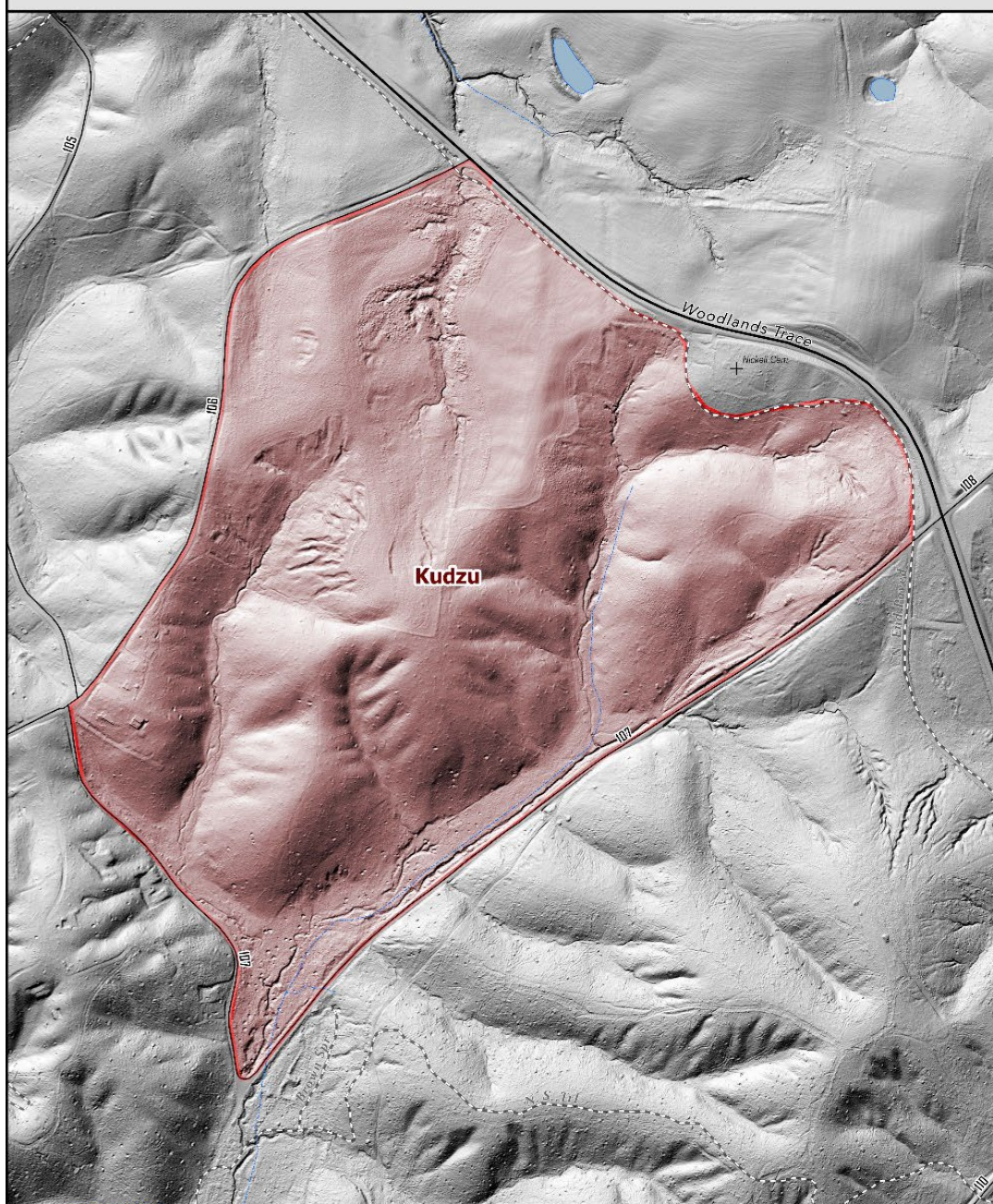
Legend

-  RX Fire Unit
-  Road
-  Trail
-  Cemetery
-  Perennial stream
-  Intermittent stream



Created on 3/23/2026 by EBarr.

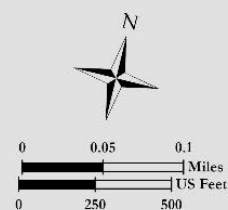
Kudzu Prescribed Fire Unit



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Legend

-  RX Fire Unit
-  Road
-  Trail
-  Cemetery
-  Perennial stream
-  Intermittent stream



Scale: 1:4,000
1 in = 0.06 mi = 333 ft
NAD 1983 UTM Zone 16N

Created on 3/23/2026 by EBar.

Aquatic

Overview

An aquatic weed harvester project for Non-Native Invasive Species (NNIPS) focuses on the mechanical removal of the aggressive, non-native invasive plant Eurasian watermilfoil (*Myriophyllum spicatum*).

Project Objective

The primary goal is to restore the ecological balance and recreational utility of a waterbody by physically extracting invasive biomass. This prevents NNIPS from outcompeting native flora, clogging drainage systems, and depleting dissolved oxygen levels.

Equipment & Mechanism

Modern harvesters (often described as "aquatic lawnmowers") typically feature:

- **Cutting & Uprooting:** Hydraulically operated rolling drums remove plants up to 4 feet below the surface. The specific machine to be used will be the [Eco-Harvester](#). This machine pulls plants by the roots to minimize regrowth, as well as having commercial abilities to also remove large amounts of weeds at a time. The action of the EcoHarvester can be described as similar to a terrestrial masticator. The difference is, the weeds are uprooted rather than shredded.
- **Collection & Storage:** A conveyor belt transfers the cut biomass onto an onboard holding area, which can carry 1,000 to 1,500 pounds per load. This will reduce the amount of offloading time required by smaller units.
- **Disposal:** Once full, the harvester will offload the material onto a shore conveyor or trailer for delivery to a disposal site. The disposal site will be determined at a future date and will be located no less than 100 yards from any water source.

Operational Workflow

Site Identification: Target dense NNIPS mats in shallow littoral zones (typically 12 inches to 4 feet deep). The primary locations for use of the harvester will be Honker and Hematite lakes. However, as other populations

Selective Harvesting: High maneuverability allows operators to steer around docks, native plant beds, and wildlife habitats.

Bioextraction: Removing the vegetation also removes excess nutrients (nitrogen and phosphorus) that would otherwise fuel further invasive growth and algal blooms.

Repurposing: Harvested NNIPS is frequently used as nutrient-rich compost or fertilizer for local agriculture.

Key Benefits for NNIS Control

Eco-Friendly: Avoids the ecological risks and water-use restrictions associated with chemical herbicides. Provides instant clearance of navigable channels and swimming areas.

Long-Term Restoration: This project will be employed on an as-needed basis with a goal of reducing the annual seed bank of invasive species over time.

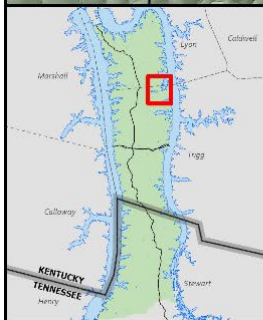
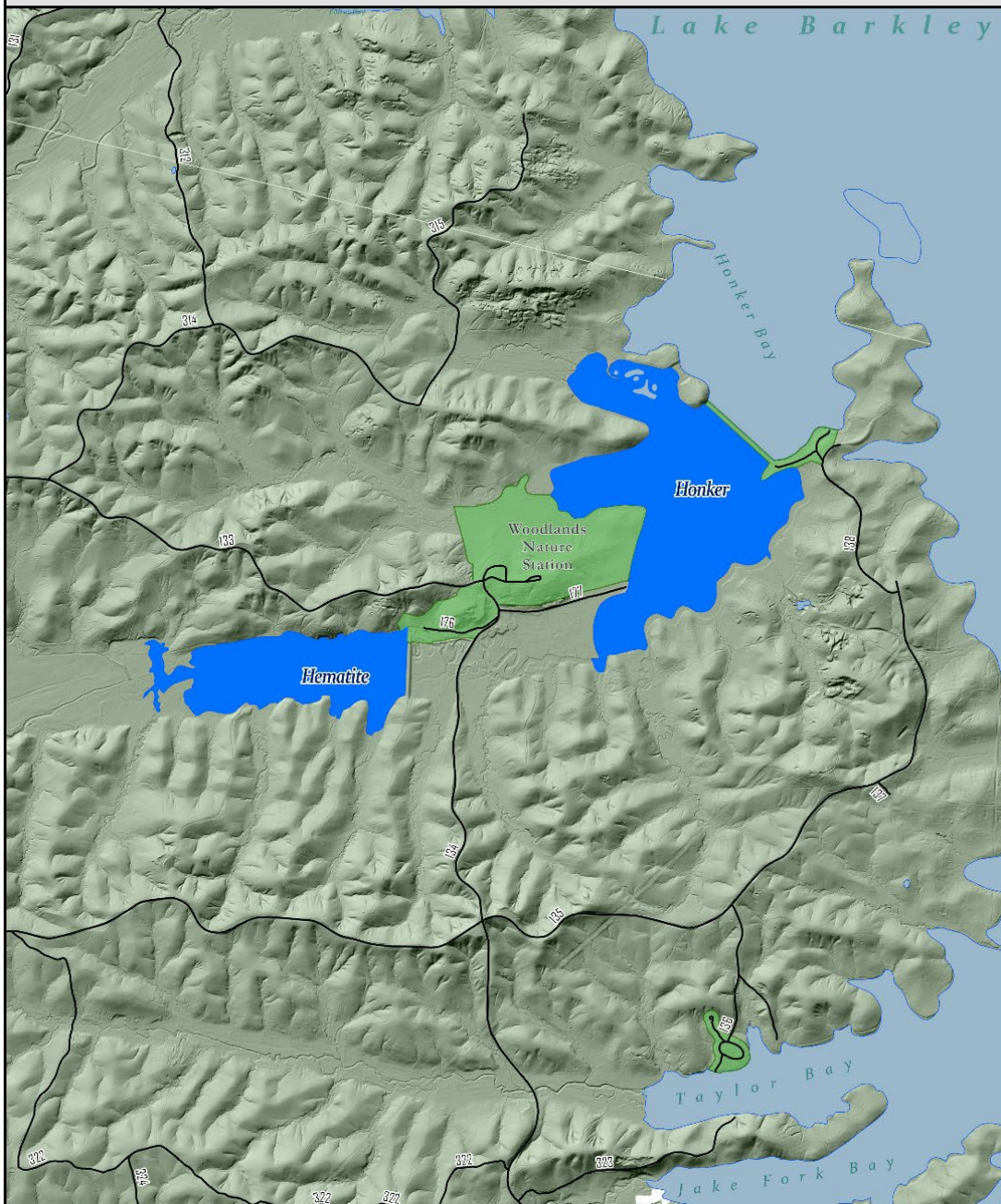
Comprehensive Approach: along with this action, future activities may include the use of aquatic herbicides to supplement the mechanical efforts. Should the need for herbicides be determined to be necessary, this will be addressed in a future Operating Plan.

Miscellaneous Comments: Since the harvester will be operating on lakes, there could be potential for incidental contact with FWS candidate species alligator snapping turtle. The harvester's design will prevent any damage or injury to turtles due to the rotary drum. The openings are too small to allow entry into the drum by turtles and will simply bump the turtles out of the path of operation.

No federally listed species of freshwater mussels occur within the interior of Land Between the Lakes. Currently, there are some species of mussels present in Honker lake and Long Creek which connects the Hematite and Honker lakes. A list of species is below. The rotary drum operates above the substrate, so no contact with freshwater mussels should occur. Impacts such as silt disturbance will be minimal and short-term in duration.

Hematite Lake	Honker Lake	Long Creek (In Between)
No mussels observed	Giant floater	Paper pondshell
	Flat floater	
	Purple lilliput	
	Paper pondshell	
	Long fingernail clam	
	Asian clam	
	Zebra mussel	

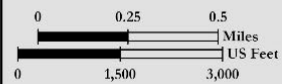
Aquatic Non-Native Invasive Species Control (Eco-Harvester)



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Legend

- Water Mastication Area
- Recreation Area
- Road



Scale: 1:18,000
1 in = 0.28 mi = 1,500 ft
NAD 1983 UTM Zone 16N

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Heritage

Heritage Program Pesticide Projects

Effects of Vegetation on Cultural Resources

Vegetation on and around historic structures can pose a significant threat, primarily through moisture damage, physical and structural destabilization, and chemical degradation. Penetration and expansion caused by roots from trees, shrubs, and vines can exacerbate existing cracks in mortar joints and masonry. They exert pressures that force apart building materials, creating new cracks and adversely affect structural integrity. Vegetation also traps moisture, prevents air circulation and evaporation, and promotes wood decay and rot. It can also impede both natural and architecturally designed drainages. Dense overgrowth will also become ready habitat for insects, rodents, birds, and microorganisms, which cause bioturbation and structural damage. Dried vegetation is also a fire hazard.

Center Furnace

Glyphosate is applied to the interior of the fenced-in remains of Center Furnace and up to 3 feet outside the fence. This is to prevent vegetation from obscuring the furnace remains as well as preserving them by eliminating the opportunity for roots to separate bricks or encourage wildlife activities that could damage the integrity of the furnace remains.

Application is typically performed twice a year, though a third application is occasionally required. Application months are generally June and August. The specific chemical used is Roundup Weathermax 41% Glyphosate, with 4 ounces of agent to 1 gallon of water mixed in a 6-gallon sprayer. Any leftover herbicide mix is depleted within the fenced-in yard of the Heritage Shop.

Empire Farm

Glyphosate (Roundup Weathermax 41%) is used on vegetation that adheres to or becomes overgrown on historic structures at Empire Farm. These structures include the barns, a house, outbuildings, a wellhouse, and a house. Application is done at least twice annually, once in the spring and again around mid-summer. Application is targeted, overspray is minimal, and the mix is 4 ounces of agent to 1 gallon of water mixed in a 6-gallon sprayer. Any leftover herbicide is discharged within the fenced-in yard of the Heritage Shop.

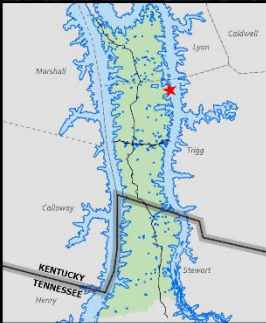
Cleo Griffin House

Glyphosate (Roundup Weathermax 41%) is used on vegetation that adheres to or becomes overgrown on historic structures at Empire Farm. These structures include the barns, a house, outbuildings, a wellhouse, and a house. Application is done at least twice annually, once in the spring and again around mid-summer. Application is targeted, overspray is minimal, and the mix is 4 ounces of agent to 1 gallon of water mixed in a 6-gallon sprayer. Any leftover herbicide is discharged within the fenced-in yard of the Heritage Shop.

Heritage Shop Yard

Glyphosate (Roundup Weathermax 41%) is used on vegetation that emerges within the yard. Much of the vegetation is controlled mechanically with weed trimmers. Herbicide is only applied when there is excess remaining in the sprayer from applications above or to discharge the sprayer when cleaning after applications above.

Empire Farm Non-Native Invasive Species Control

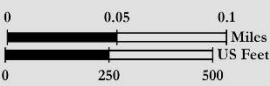




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Legend

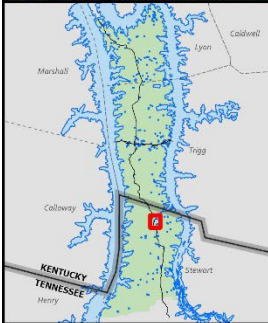
-  Empire Farm
-  Road
-  Trail



Scale: 1:3,000
1 in = 0.05 mi = 250 ft
NAD 1983 UTM Zone 16N

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Cleo Griffin House Non-Native Invasive Species Control




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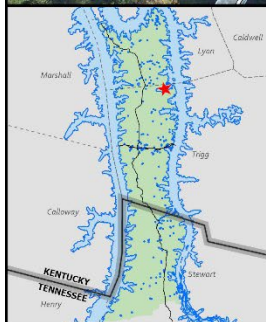
Legend

-  Cleo Griffin House
-  Road
-  Trail


0 0.1 0.2 Miles
0 500 1,000 US Feet
Scale: 1:8,000
1 in = 0.13 mi = 667 ft
NAD 1983 UTM Zone 16N

Created on 3/23/2026 by EBarr.

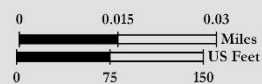
Center Furnace Non-Native Invasive Species Control



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Legend

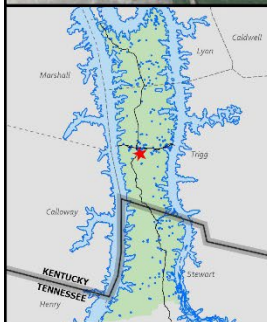
- Center Furnace
- Road
- Trail



Scale: 1:1,000
1 in = 0.02 mi = 83 ft
NAD 1983 UTM Zone 16N

Created on 3/23/2026 by EBarr.

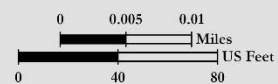
Heritage Shop Yard Non-Native Invasive Species Control



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Legend

- Heritage Shop Yard
- Road
- Trail



Scale: 1:500
1 in = 0.01 mi = 42 ft
NAD 1983 UTM Zone 16N

Created on 3/23/2026 by EBarr.

Murray State University Invasive Species Stewardship Program

Overview

This project will take place on the Land Between the Lakes National Recreation Area (LBL NRA). The project will engage residents from surrounding gateway communities in Lyon, Trigg, Marshall, Calloway, and Livingston counties (KY) and Stewart and Henry counties (TN), as well as other communities in the Riverlands Alliance region. These rural communities have strong ties to LBL through recreation, hunting, fishing, and tourism. The invasive species targeted through this project are widespread on LBL and threaten forest health, wildlife, and recreation values, making this stewardship effort directly beneficial to both the National Forest System and the surrounding communities.

Project Objective

- Engage at least 75 community members in the Riverlands region in hands-on Non-Native, Invasive Plant Species (NNIPS) removal on Land Between the Lakes (LBL) National Recreation Area (NRA) through five stewardship events conducted by September 2027.
- Increase participant knowledge and awareness of NNIPS ecology, identification, and management for at least 75 community members through training and field activities focused on privet, autumn/Russian olive, Amur honeysuckle, tree-of-heaven, and kudzu during five stewardship events on the LBL NRA by September 2027.
- Implement on-the-ground NNIPS treatment at five priority sites on the Land Between the Lakes National Recreation Area, using cut-stump, hack-and-squirt, and vine-cutting methods, and document treated areas, species addressed, and before-and-after conditions during each stewardship event by September 2027.

Operational Workflow

Each stewardship event will follow a consistent format. Participants will attend a morning training session that includes classroom instruction, field identification, and demonstration of treatment methods for the focal invasive species. This will be followed by a supervised four-hour field stewardship period in which participants will implement approved invasive plant control techniques (e.g., cut-stump, hack-and-squirt, or vine cutting) under the direction of Dr. Darracq and USFS staff. This training-plus-action format is designed to build long-term stewardship skills rather than one-time volunteer labor. The events, their focal species, and draft titles are below:

1. Period: September 2026 Focal species: Privet Title: Breaking the Green Wall
2. Period: December 2026 Focal species: Amur Honeysuckle Title: Understory Takeover
3. Period: April 2027 Focal species: Autumn/Russian Olive Title: Holding Ground in Winter
4. Period: August 2027 Focal species: Tree-of-Heaven Title: The Tree That Fights Back
5. Period: October 2027 Focal species: Kudzu Title: The Vine That Ate the South

Site Identification:

The primary focus will be located at:

- Golden Pond Visitor Center
- Fenton day use area
- Woodlands Nature Station
- Duncan Bay area
- KY-80 within the KYTC ROW

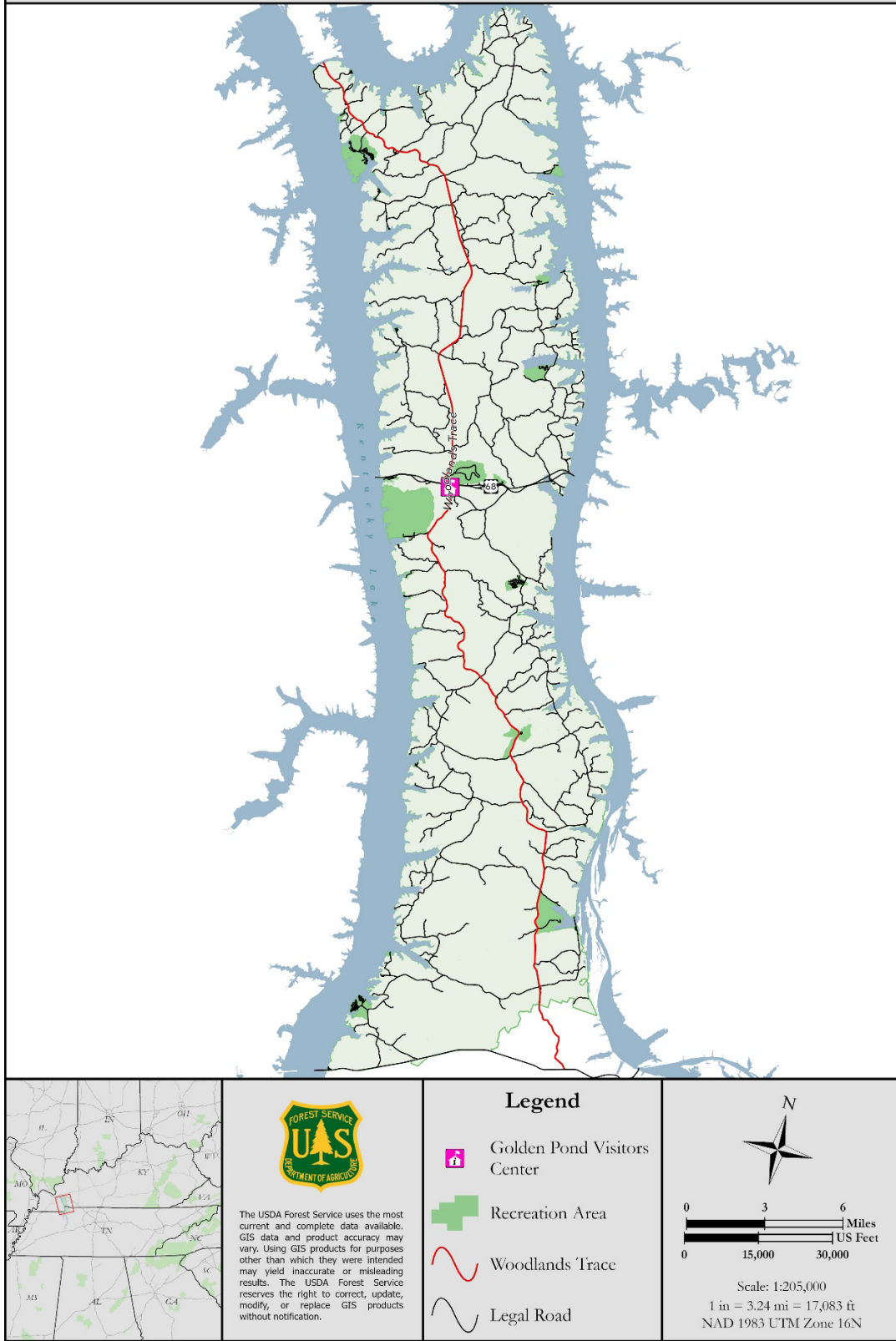
- Along the Woodland Trace

Visual Quality

Any debris piles will be moved out of direct public sight by relocating into forested areas or far enough away from roads and trails so as not to create a visual impairment.

Comprehensive Approach: This action is part of a comprehensive and long-term approach. Multiple treatments which may be utilized include herbicides, mechanical, fire, and hand.

Murray State University Invasive Species Stewardship Program



Recreation and Openlands Management

Primary objective

The primary goal is to maintain vegetation at developed recreation areas, facilities, and trails. This prevents NNIPS from spreading, outcompeting native vegetation, and over taking infrastructure.

Openlands

- Treatment of approximately 2,500 acres of openlands using herbicides, mastication, and prescribed fire.
- Reclamation of approximately 200 acres of fields through various treatment methods primarily mowing and mastication. Pre-identified areas are located in hunt areas 1, 8, 10, 11, and 13.

Developed Recreation Area Maintenance and Treatment

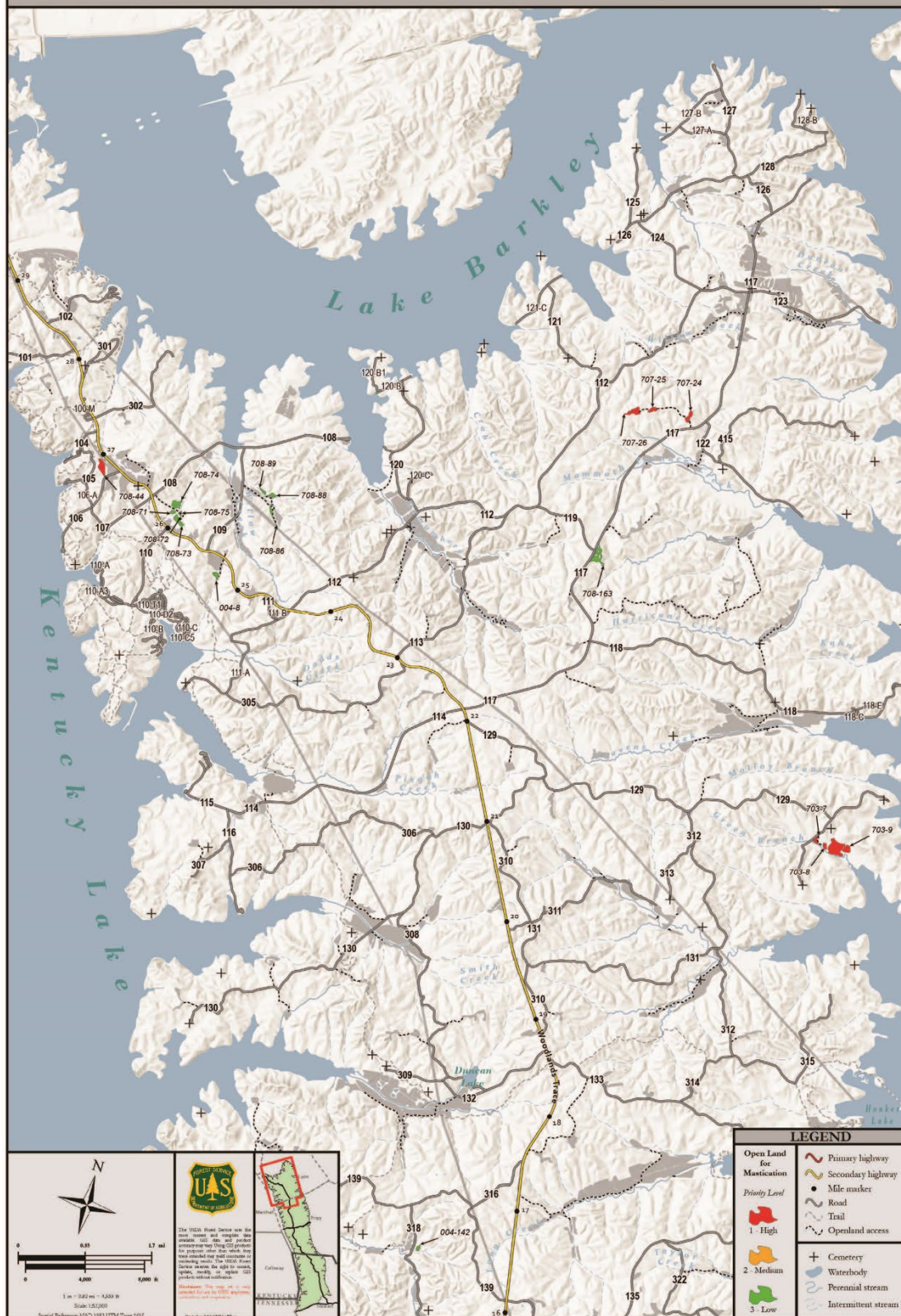
Herbicide application to spot treat approximately 4000 camping pads, and edges of defined infrastructure such as buildings and roads for. This will occur in all developed and administrative areas within Land Between the Lakes Recreation Area. The primary target species within developed campgrounds is *Sericea Lespedeza* (*Lespedeza cuneata*) and Autumn Olive (*Elaeagnus umbellata*), however, any other NNIPS encountered will be treated as well.

Honker Lake dam, Hematite dam, Duncan Lake dam, Energy Lake dam, Bards Lake dam, Fenton Jetty, and Firing Range berms will receive periodic herbicide treatments throughout the growing season to treat *Sericea Lespedeza*, Silk Tree or Mimosa (*Albizia julibrissin*), and Tree of Heaven (*Ailanthus altissima*).

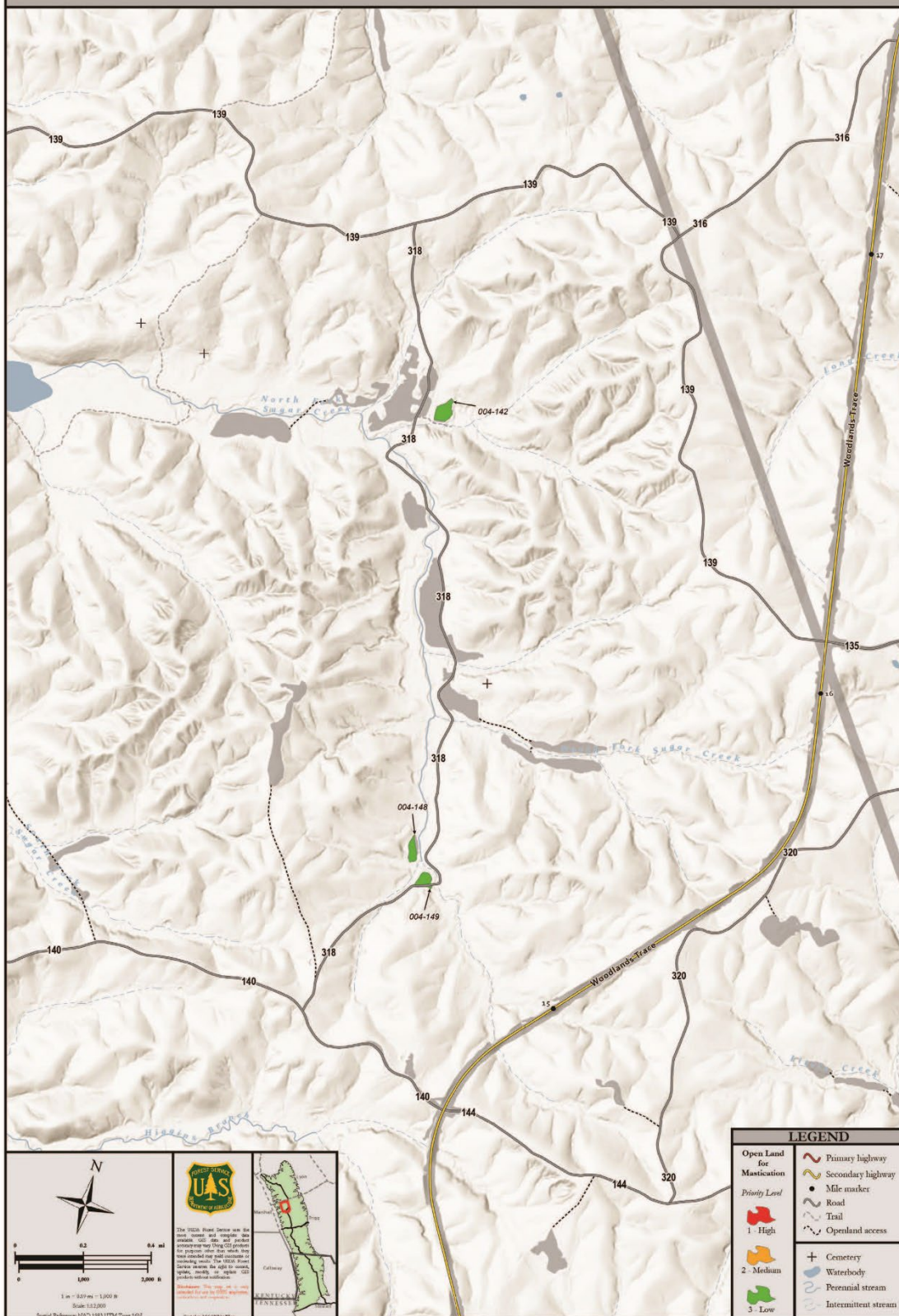
Elk and Bison Prairie and South Bison Range management will consist of mowing and herbicide applications by means of spot treatment methods to target Johnson Grass, *Sericea Lespedeza*, Autumn Olive, Mimosa, and Bull Thistle (*Cirsium vulgare*).

Land Between the Lakes National Recreation Area

NDA Open Lands Mastication: **Map A**



Land Between the Lakes National Recreation Area NDA Open Lands Mastication: **Map B**



Land Between the Lakes National Recreation Area

NDA Open Lands Mastication: **Map C**



Land Between the Lakes National Recreation Area

NDA Open Lands Mastication: **Map D**



South Bison Range

408-366

408-369

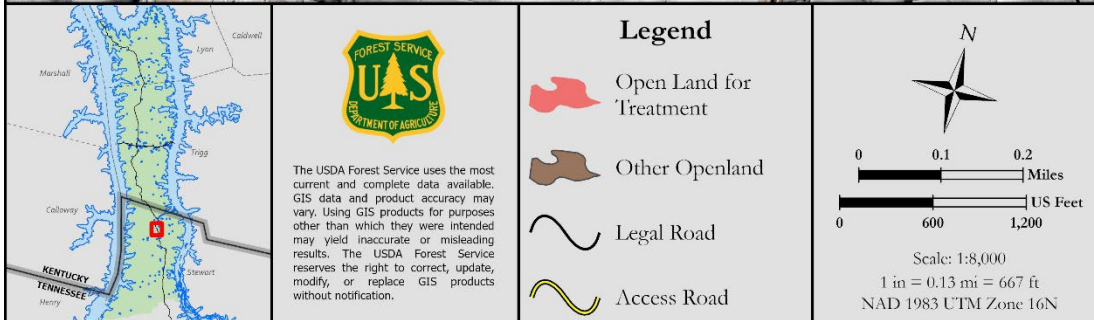
Woodlands Trace

205

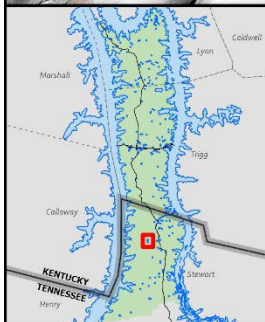
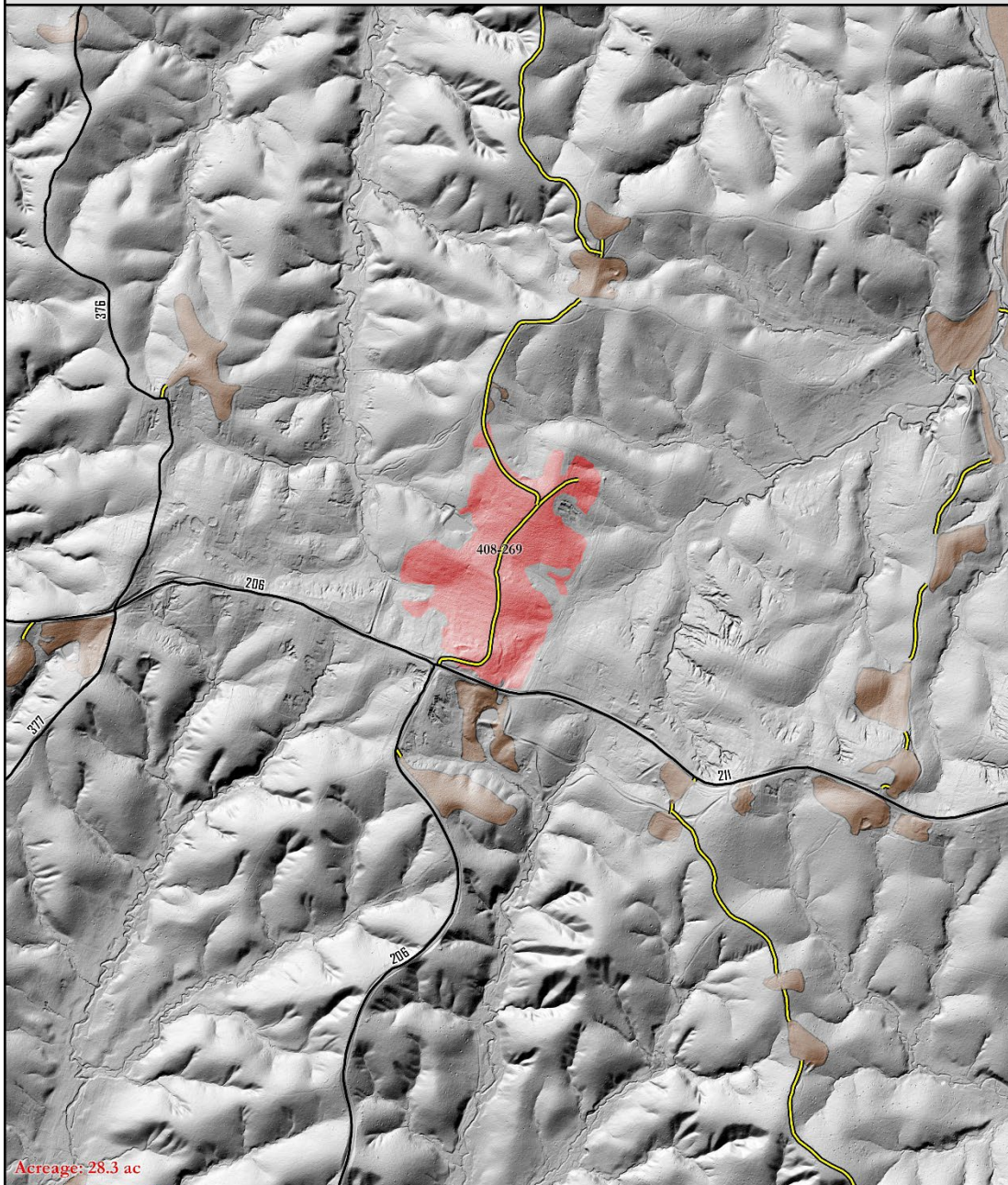
204

218

Acres: ac



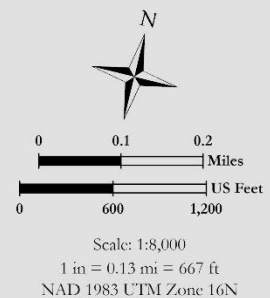
Tower Site Non-Native Invasive Species Treatment and Native Forb Establishment



The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than which they were intended may yield inaccurate or misleading results. The USDA Forest Service reserves the right to correct, update, modify, or replace GIS products without notification.

Legend

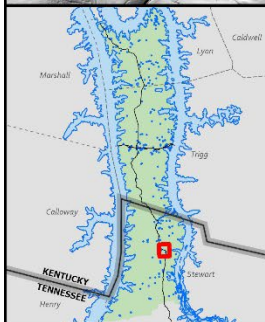
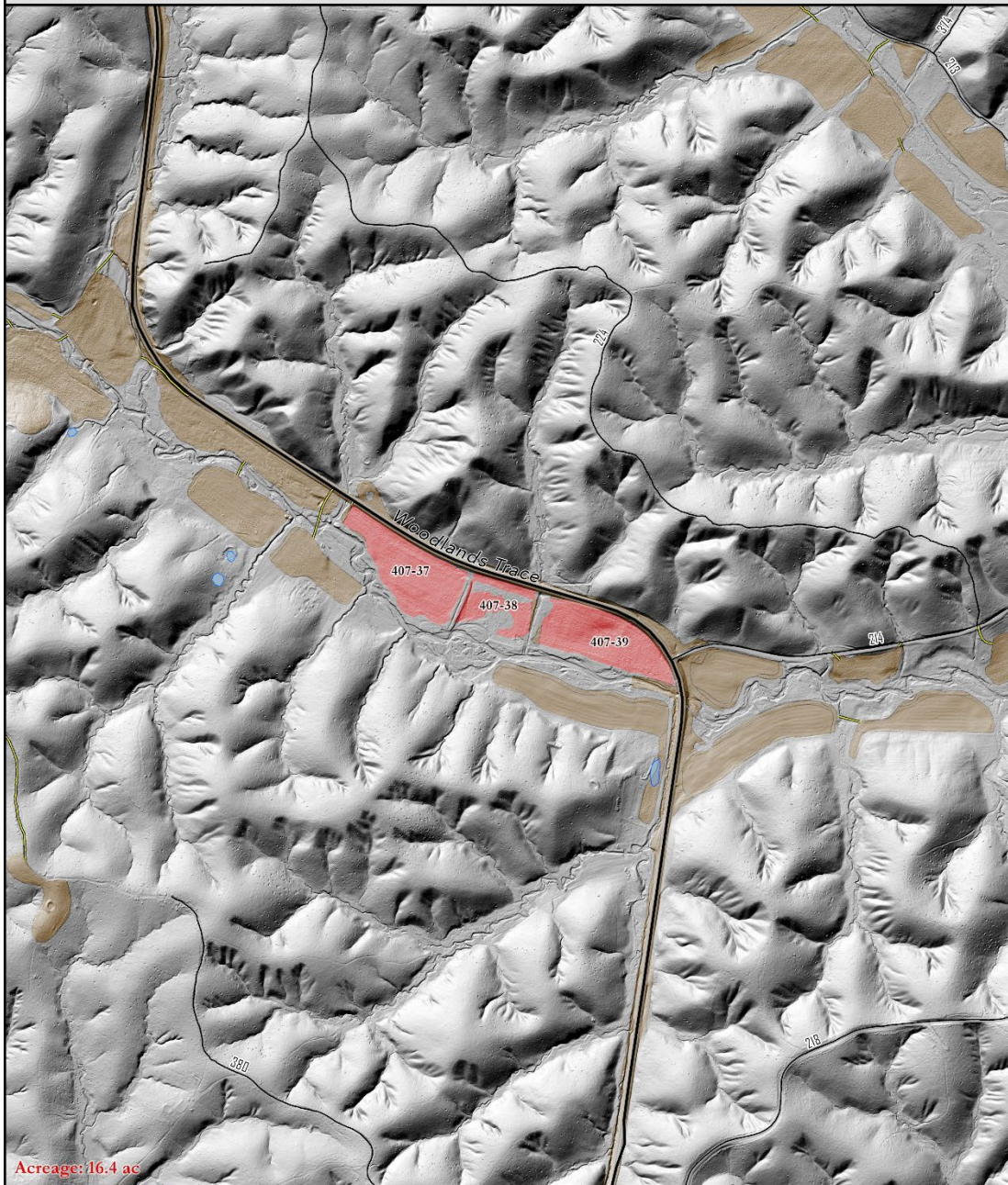
-  Open Land for Treatment
-  Other Openland
-  Legal Road
-  Access Road



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Neville Creek Site

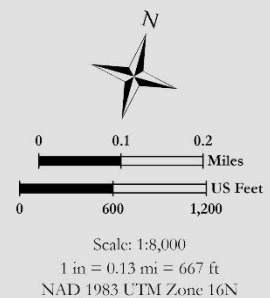
Non-Native Invasive Species Treatment and Native Forb Establishment



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Legend

-  Open Land for Treatment
-  Other Openland
-  Legal Road
-  Access Road



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Mitigation measures

- At all times, the use of any herbicides will follow the manufacturer's label for use. Whenever possible, minimum mixtures and/or concentrations will be used.
- All treatment areas involving commercial harvests, cut and leave, prescribed fire, herbicide treatment, etc. will be surveyed by the Heritage staff for potential conflicts with protected areas/sites/buffers. If necessary, any archaeological resources identified will be flagged to indicate a No-disturbance area.
- Currently, 11 cemeteries and 80 known heritage sites have been identified within proposed project sites. These sites have been coordinated with the project leads and will be monitored closely during activities to ensure protection.
- Animal and plant species known to occur in the project areas include Barbed rattlesnake root, bald eagle nest, Price's potato bean, and prairie dock. All necessary measures will take place in order to avoid "ESA Take" occurring.
- Any NNIS plant treatments along the Woodlands Trace will be individually coordinated with the T&E coordinator prior to treatments commencing.
- The National Bald Eagle Management Guidelines will be followed for protection of the 2 bald eagle nests occurring in project area.
- Resource specialists have reviewed all proposed projects and submitted responses which include mitigation measures. Should conditions on the ground change, the project managers will coordinate with the resource specialists for guidance on how to proceed.

I have thoroughly reviewed the objectives, methodology, and timeline outlined in the document. I find the proposed work to be technically sound, feasible within the given timeframe, and well aligned with our current Land and Resource Management Plan goals.

I hereby approve these projects through completion and will provide the necessary guidance and resources to ensure success.

James R. McCoy
Area Supervisor
Land Between the Lakes National Recreation Area

Date

All questions and comments can be directed to Andy Mowrey at andrew.mowrey@usda.gov or 270-924-2131.