

Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats

Vermont Fish and Wildlife Department Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats February 2017

Purpose

This guidance is specific to land use activities subject to environmental review (e.g., Act 250, Section 248) that result in permanent alterations to habitats used by northern long-eared bats (*Myotis septentrionalis*), hereinafter referenced as MYSE. Forest management guidance, including woodchip plant harvests under the Public Service Board, is provided under separate documents. This is a working document, which may be revised as new information becomes available to best guide decision-making.

The purposes of the guidance are to:

1. Reduce the likelihood of take or harm of MYSE to the level where the land use activity is not likely to adversely affect the species.
2. Maintain suitable hibernating, roosting, and foraging habitat to support continued use of *known, occupied sites* for MYSE.

Considerations

1. Current MYSE population levels in Vermont are unknown, but survey data since 2010 indicate that MYSE populations are approximately less than 10% of what they were prior to White-nose Syndrome (WNS). This alone limits the likelihood of take by any land use activity in Vermont. As a result, the focus of the guidelines is primarily on known, occupied habitats.
2. A 1% rule is recommended to further decrease the likelihood of take to what may be viewed as a “discountable effect”. The assumption is that removal of less than or equal to 1% of the *existing forested area (including both suitable and unsuitable forested habitat) within each Special Management Zone (SMZ)* represents a 99% chance that the activity will not fell or clear any trees with roosting MYSE bats. Projects meeting such thresholds are considered to have a discountable effect and need not take any special precautions to avoid take. Projects impacting more than the 1% rule must adequately reduce the likelihood of take through seasonal restrictions on land clearing activities and/or the implementation of potential roost tree retention practices.
3. The guidance is more restrictive at known, occupied hibernacula and summer habitats due to evidence of presence of MYSE and the value of consistency with the USFWS 4(d) rule. At such sites, the guidelines are intended to both limit potential take of MYSE and maintain suitable habitat conditions. At sites lacking any information on the presence or absence of MYSE, the presence of MYSE is still assumed, albeit at a lower likelihood,

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and as such the guidelines focus strictly on reducing the likelihood of take by applying more limited seasonal restrictions when the bats, if present, would be most abundant.

4. The measures offered primarily focus on avoiding take of roosting bats during the summer season when they are active throughout the landscape. In addition, the measures address forestland conversion during the winter season that results in large acreages of unsuitable habitat where a potential maternity colony may exist. While no direct take of MYSE would occur in such situations, the elimination of most, if not all of a colony's roost trees would likely result in indirect take by impacting their survival and productivity.
5. The guidance applies only to land use activities within suitable MYSE roosting habitat. While more research is needed to identify the specific variables associated with unsuitable habitat, for the purposes of this guidance, unsuitable roosting habitat for MYSE includes:
 - Forest stands with all tree diameters less than 4 inches DBH.
 - Forest stands predominantly (i.e., 90%) composed of spruce-fir
 - Forest stands with less than 50% canopy closure
 - Individual trees isolated by more than 100 feet from forest habitat
6. Project impacts exceeding the limits of forested habitat conversion may be required to adopt additional mitigation measures that ultimately benefit MYSE conservation. Such measures may include conservation easements, forest management agreements, or critical research.
7. Finally, terms frequently used in this document are defined below to clarify the extent of their meaning relative to this guidance document:

Land Use Activity: Activities associated with the clearing or cutting of standing trees subject to environmental review (e.g., Act 250, Section 248) that result in permanent alterations to habitats for northern long-eared bats.

Potential Roost Trees (PRT): Potential roost trees include all trees greater than 4 inches in diameter that exhibit cavities, cracks or crevices, or exfoliating bark located at least 10 feet in height from the ground. While research demonstrates the use of such features even on live trees by roosting MYSE, it is understood that the majority of roosts used by the species are dead and dying trees and that no visual survey method will be able to effectively identify all potential roost trees.

Special Management Zones (SMZ): Special management zones are the areas surrounding either known, occupied sites (e.g., hibernacula, known summer habitat) or land use activity sites, within which specified conservation measures are expected to avoid take of MYSE.

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Known, Occupied Hibernacula

Definition: Both historic and/or current documentation of one or more MYSE is considered a known, occupied hibernaculum. It must be noted that MYSE are particularly difficult to observe during hibernation due to their preference for roosting in cracks and crevices in cave/mine walls. Therefore, this species may be underestimated or go undetected during some winter hibernacula surveys. In addition, MYSE bats visit and swarm at multiple hibernacula during the fall, making the forested area directly surrounding hibernacula important for species conservation.

Population Status: There are currently 25 known, occupied hibernacula in Vermont with documentation of hibernating northern long-eared bats.

Special Management Zones: The literature suggests that the majority of the roost trees used during the fall swarming period are located within 1.6 miles of the hibernaculum entrance. Given the very low abundance of MYSE within each hibernaculum, it is recommended that the impacts of land use activities be evaluated at distance thresholds for two zones with radii of 0.25 miles and 1.0 miles from the cave/mine entrance.²

- Special Management Zone 1: This zone is within a 0.25-mile radius of the cave/mine entrance and is designed to maintain the physical and environmental integrity of the hibernacula as well as sufficient roosting habitat. This distance is identical to the USFWS 4(d) rule under which no tree cutting activities are exempt from the take provisions of the Endangered Species Act. *Any tree cutting within this zone must first contact the USFWS to assure that the following conservation measures will result in no adverse effect on the species:*
 - No activities that will impair the integrity of the hibernacula are allowed. Tree clearing, road construction, or buildings are not allowed directly adjacent to hibernacula entrances.
 - Land use activities impacting *less than 1% of the existing forested acreage* (i.e., 1.25 acres in a completely forested landscape) within the SMZ are allowed, provided all tree cutting is prohibited during the period April 15 – October 31, when bats are active and concentrated in the forested area around hibernacula.¹ Tree clearing may occur during the period April 15 – August 15 if acoustic surveys demonstrate probable absence of MYSE during that period (see Appendix A VFWD Guidelines for Acoustic Surveys for Endangered Bats).
 - Land use activities impacting *greater than 1% of the existing forested acreage* within the SMZ will be reviewed to reduce the impact on the known, occupied hibernaculum habitat and include:
 - Seasonal restrictions so that all tree clearing is prohibited during the period April 15 – October 31, when bats are either active or concentrated in the forested area around hibernacula.¹

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- Potential roost tree retention guidelines (see VFWD Potential Roost Tree Retention Guidelines for Endangered Bats) must be applied by a forester or biologist trained in potential roost tree identification on the remainder of the project lands to provide for future roost trees (see Appendix B Survey Methods for Potential Roost Trees for Endangered Bats).^{3,6}
- Limit tree clearing to 2% of the contiguous forested acreage (i.e., 2.5 acres in a completely forested landscape). Projects requiring tree clearing beyond 2% will require additional mitigation measures.
- Conversion and fragmentation of the forest canopy must be minimized to maintain bat migration and movement within the Special Management Zone 1.
- Special Management Zone 2: This zone is between 0.25 and 1.0-mile radius from the cave/mine entrance and is designed to maintain suitable roosting and foraging habitat during the swarm and emergence periods. While 1.0 mile is less than the 1.6-mile radius documented for all roosts used by MYSE, the limited number of MYSE at known, occupied hibernacula in Vermont allow for a smaller radius for Zone 2.²
 - Land use activities impacting *less than 1% of the existing forested acreage* (i.e., 20 acres in a completely forested landscape) within the SMZ are allowed, provided to avoid take, all tree clearing is prohibited during the period April 15 – October 31, when bats are active and concentrated in the forested area around hibernacula.¹ Because of the limited acreage involved, projects may allow for such seasonal restrictions to be waived upon completion of a survey for potential roost trees by a trained forester or biologist that identifies, marks, and retains all potential roost trees. Tree cutting during the period April 15 – August 15 may also occur if acoustic surveys demonstrate probable absence of MYSE during that period.
 - Land use activities impacting *greater than 1% of the existing forested acreage* within the SMZ will be reviewed to reduce the impact on the known, occupied hibernaculum habitat and may include the following measures (e.g., potential roost tree retention guidelines) to mitigate for such impacts:^{3,6}
 - Apply seasonal restrictions so that all tree cutting is prohibited during the period April 15 – October 31, when bats are either active or concentrated in the forested area around hibernacula. ¹ Tree cutting during the period April 15 – August 15 may occur if acoustic surveys demonstrate an absence of MYSE during that period.
 - Potential roost tree retention guidelines (see VFWD Potential Roost Tree Retention Guidelines for Endangered Bats) must be applied on the remainder of the project lands.^{3,6}

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- Limit tree clearing to 2% of the forested acreage (i.e., 40 acres in a completely forested landscape) within the SMZ. Clearing beyond 2% of the forested habitat requires additional mitigation.
- Fragmentation of the forest canopy must be minimized to maintain bat migration and movement within the Special Management Zone.

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Known, Occupied Summer Habitat

Definition: Known, occupied summer habitat consists of:

- Known, occupied maternity roost trees used by adult females or juveniles. The USFWS 4(d) rule applies only to known, occupied maternity roost trees and a 150-foot buffer.
- Documented reproductive adult female MYSE captured during the maternity season (May 1 – August 15) are considered confirmation of a maternity colony. Locations of such animals documented since 2010 are considered known, occupied MYSE maternity colonies as well. Whenever possible, radio telemetry is used on captured reproductive females to determine the exact locations of the maternity colony's roost trees and the size of the maternity colony.
- Captured MYSE regardless of sex or age are considered known, occupied summer habitat, but without any evidence of a maternity colony.
- Locations documenting MYSE acoustic calls are considered known occupied summer habitat, but without any evidence of a maternity colony.

Documentation of known, occupied summer habitat is valid for 5 years, after which acoustic and/or mist-net surveys may be conducted that confirm or deny their presence within the Special Management Zone. Verifying the status of known, occupied summer habitat may require more intensive survey efforts than required by USFWS guidelines for determining presence/probable absence.

Population Status: There are 71 known locations with historic presence of adult female MYSE captured during the summer months in Vermont. Since 2010, after the full population effects of WNS in Vermont, MYSE have been difficult to capture through a very limited survey effort. Only 13 adult female MYSE have been observed at nine sites statewide between 2010 and 2016. In only two of those instances have bats been telemetered successfully to identify maternity roost sites. In addition, there are several locations at which multiple acoustic MYSE calls have been detected since 2010.

Special Management Zones: Scientific literature suggests that the roost trees used by MYSE are more concentrated in area than other species such as Indiana bats. Given the mean distance between roosts for a single bat approximates 0.42 miles and research showing maximum distances ranged from 1.2 to 2.4 miles apart, it is recommended that the impacts of land use activities be evaluated at distance thresholds for two zones with radii of 0.25 and 1.0 miles from the location of the known maternity colony roost trees, the capture site (if no roost trees are known), or the location of acoustic detections.

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- Special Management Zone 1: This zone is within a 0.25-mile radius of the known, occupied summer habitat and is designed to be more sensitive to the increased likelihood that additional roost trees are proximate to the known sites.
 - The removal of any known, occupied roost trees and any trees within 150 feet are prohibited. The 150-foot buffer is a result of the final USFWS 4(d) rule.
 - Land use activities *less than 1% of the existing forested acreage* (i.e., 1.25 acres in a completely forested landscape) within the SMZ are allowed, provided all tree cutting is prohibited during the period April 15 – September 30.
 - Where no known maternity colony exists (i.e., only male MYSE have been captured or acoustic calls have been documented), because of the limited acreage involved, forest management activities may allow for such seasonal restrictions to be waived upon completion of a survey for potential roost trees by a trained forester or biologist that identifies, marks, and retains all potential roost trees.
 - Land use activities impacting *greater than 1% of the existing forested acreage* within the SMZ will be reviewed to reduce the impact on the known, occupied summer habitat and may include the following measures:
 - Prohibit tree clearing during the period April 15 – September 30.⁴
 - Limit tree clearing to 2% of the forested acreage (i.e., 2.5 acres in a completely forested landscape) within the SMZ.
 - Apply potential roost tree retention guidelines (see VFWD Potential Roost Tree Retention Guidelines for Endangered Bats) on the remainder of the project lands.^{3,6}
 - Fragmentation of the forest canopy should be minimized to maintain bat migration and movement within the Special Management Zone.
- Special Management Zone 2: This zone is between 0.25 and 1.0-mile radius from the known, occupied summer habitat and is designed to maintain suitable roosting and foraging habitat during the maternity season.
 - Land use activities impacting *less than 1% of the existing forested acreage* (i.e., 20 acres in a completely forested landscape) within the SMZ will be allowed, provided all tree cutting is prohibited during the period April 15 – September 30.⁴ Because of the limited acreage involved, projects may allow for such seasonal restrictions to be waived upon completion of a survey for potential roost trees by a trained forester or biologist that identifies, marks, and retains all potential roost trees.
 - Land use activities impacting *greater than 1% of the existing contiguous forested acreage* within the SMZ will be reviewed to reduce the impact on the known, occupied summer habitat and may include the following measures:
 - Prohibit tree clearing during the period April 15 – September 30.⁴

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- Limit tree clearing to 2% of the contiguous forested acreage (i.e., 40 acres in a completely forested landscape) within the SMZ.
 - Apply potential roost tree retention guidelines (see VFWD Potential Roost Tree Retention Guidelines for Endangered Bats) on the remainder of the project lands.^{3,6}
- Fragmentation of the forest canopy must be avoided or minimized to maintain bat migration and movement within the Special Management Zone.

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Potential Summer Habitat

Definition: This encompasses the remainder of the state where no known, occupied summer habitat or hibernacula exist (see definitions above). While no known occurrences have been documented in this region since 2010, historical inventory data indicates that all of the state serves as suitable habitat for the northern long-eared bat.

Population Status: Until such time that Vermont can compile significant additional acoustic and capture data on the statewide distribution and abundance of MYSE, one should assume that the presence of maternity colonies on the summer landscape is less than 10% of pre-WNS numbers. Following this logic, every project has less than a 10% chance of impacting a maternity colony compared to before the impacts of WNS. However, without data to the contrary or knowledge of the exact whereabouts of all remaining bats, the presence of MYSE on project sites should be assumed if the purpose is to avoid take of the species. Projects outside known, occupied range may conduct acoustic surveys to demonstrate the probable absence of MYSE and, as a result, avoid all restrictions provided below.

Special Management Zone: Given the mean distance between roosts for a single bat approximates 0.42 miles and research showing maximum distances ranged from 1.2 to 2.4 miles apart, a radius of 1.0 miles from the potential maternity colony should be sufficient to include most of the roost trees used by a colony should it be present.

Based on a project's impacts to habitat within a 1.0-mile radius surrounding the center of the project area:

- Land use activities impacting *less than 1% of the existing forested acreage* within a 1.0-mile radius of the land use activity (i.e., 20 acres in a completely forested landscape) will be allowed without any conservation measures necessary.
- Land use activities impacting *greater than 1% of the forested acreage* within the SMZ can avoid all restrictions if acoustic surveys are conducted during the months of June and July and results demonstrate probable absence of MYSE on the project site. (see Appendix A VFWD Guidelines for Acoustic Surveys for Endangered Bats).
- Land use activities impacting *greater than 1% of the existing forested acreage* within a 1.0-mile radius of the land use activity (i.e., 20 acres in a completely forested landscape) will be reviewed to reduce the impact on potential maternity colony habitat and may include the following measures:
 - Prohibit tree clearing during the period April 15 – August 31⁵
 - Apply potential roost tree retention guidelines (see VFWD Potential Roost Tree Retention Guidelines for Endangered Bats) on the remainder of the project lands.^{3,6}

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- Limit forest conversion to 2% of the forested acreage (i.e., 40 acres in a completely forested landscape).⁷
- Land use activities impacting more than 2% of the forested acreage (i.e., 40 acres in a completely forested landscape) within the SMZ must conduct acoustic surveys to determine the presence or probable absence of MYSE. (see Appendix A VFWD Guidelines for Acoustic Surveys for Endangered Bats). Without such surveys, any project that impacts more than 2% of the forested habitat will be evaluated for its overall impact on a potential maternity colony, requiring no less than a prohibition on the clearing of trees at least during the period of April 15 – August 31 and additional mitigation, depending on the acreage of the habitat impacted.

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¹ August 15 is considered the period when maternity colonies begin to break up and MYSE numbers at fall swarm surveys increase dramatically. The literature also supports MYSE presence at fall swarm sites dropping off considerably by mid-October. Data from Whittaker (1993) shows this timeline and recent Vermont fall swarm captures demonstrate female MYSE bats are present at hibernacula by August 29.

² Since 2010, the highest number of MYSE observed at any single hibernaculum in Vermont was three. This figure equates to a pro-rated density of one MYSE for every 670 acres within a SMZ of a radius of 1.0 mile. Even if the observed numbers were a small percentage of the actual, the likelihood of take is low enough so that a 1.0-mile radius sufficiently protects the bats roosting within it. SMZ size designed to capture nearly all of the possible roost trees (1.6-mile radius) is best addressed under the guidance for potential maternity colony habitat.

³ Studies have shown as high as 65% of the roost trees used by MYSE were cavity trees. Assuming all cavity trees are identifiable, snag retention guidelines, when applied, may reduce the likelihood of take by that proportion. Hence, even a land use activity impacting 2% of the forested habitat has a 98.65% of not taking any roosting bats.

⁴ Because evidence exists for the presence of adult female MYSE, seasonal restrictions on clearing trees should encompass the entire period of time when bats may be present. The April period assumes some female bats migrate directly to their maternity sites and fall swarming data suggests that all MYSE have arrived at the hibernacula by early October.

⁵ Because evidence does not exist for the presence of MYSE, seasonal restrictions of April 15 – August 31 is intended to cover the period when MYSE are most concentrated in maternity colonies.

⁶ Potential roost trees include all trees exhibiting any number and degree of cavities, crevices, or exfoliating bark.

⁷ The single year 40-acre limit on acreage below 60% canopy closure assures that any possible maternity colony on site will not have greater than 25% of its roost trees removed, a figure at which research suggests the colony will remain intact (Silvis 2015). The 40-acre patch size limit is also approximately 25% of 180 acres, the largest reported mean concentration of maternity roost trees.

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Appendix A

Conducting and Reporting on Presence/Probable Absence Surveys for Northern Long-Eared Bats Vermont Fish and Wildlife Department February 2017

Projects occurring in potential northern long-eared bat range, or in known, occupied summer habitat with occurrence data that is more than 10 years old may require presence/probable absence surveys. Surveys should follow the methods outlined below and any questions should be directed to Alyssa Bennett, Small Mammals Biologist, at Alyssa.bennett@vermont.gov

Field Survey Methods:

At a minimum, the Vermont Fish and Wildlife Department (VFWD) will require the latest acoustic methods approved by the US Fish and Wildlife Service for presence/probable absence surveys for Indiana bats (USFWS Range-Wide Indiana Bat Summer Survey Guidelines), which was extended to include northern long-eared bats following their federal listing as threatened under the Endangered Species Act in 2015. **The only exception is that the acoustic monitoring must be conducted between June 1 and July 31 in Vermont.**

The monitoring must be conducted by a consultant adequately trained in bat acoustic monitoring and call analyses. Prior to conducting the monitoring, the contractor should provide the VFWD with an acoustic monitoring plan that includes:

- The project plan with a map of the proposed tree trimming/removal area and the proposed acoustic survey locations
- The consultant's training and experience in conducting such surveys
- The equipment and analysis methods to be used for the survey

Reporting Results:

Survey results should be reported to the VFWD within 60 days of the completion of the survey and/or with sufficient time to allow the VFWD to review the results and determine whether further surveys need to be conducted before habitat-altering activities take place. Acoustic survey presence/probable absence results will be valid for up to five years after the survey was conducted, as significant population increases and recolonization into vacant habitat is not expected to occur quickly for the northern long-eared bat.

Under the Vermont Endangered Species Act and the Federal Endangered Species Act, threatened and endangered species' exact location information is protected. Therefore, specific locations where the northern long-eared bat or any other state and/or federally listed species has been

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demonstrated to occur should be used for planning purposes only and not shared outside the VT Agency of Natural Resources unless a specific information request or data sharing agreement has been granted. However, known, occupied hibernacula and known, occupied summer habitat locations are mapped with a red, 1-mile radius and are updated periodically with new survey data on the Vermont Agency of Natural Resources (VANR) Atlas. These locations will show up when the “Rare Threatened Endangered Species” layer of the “Fish and Wildlife” tab is selected and visible.

Resources:

VANR Atlas: <http://anrmaps.vermont.gov/websites/anra/>

Specific element occurrence reports appearing on the Atlas are available through the **Vermont Natural Heritage Inventory** by contacting Jodi Shippee at Jodi.shippee@vermont.gov or Everett Marshall at Everett.Marshall@vermont.gov

USFWS. 2016. Range-Wide Indiana Bat Summer Survey Guidelines 2016. Available and updated at:

<http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html>

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APPENDIX B

Survey Methods for Potential Roost Trees for Endangered Bats Vermont Fish and Wildlife Department February 2017

Surveys for potential roost trees of Vermont state endangered bats should be conducted by personnel trained and experienced in the identification of potential roost trees used by Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*).

1. Determine if the project area is within the range of the Indiana bat and/or northern long-eared bat. ***Please note that based on historic and current data, northern long-eared bat range in Vermont is state-wide, but this distribution information may change in the future with continued data collection.***
2. Determine if the project contains suitable roosting habitat for Indiana bats (based on the U.S. Fish and Wildlife Service Range-Wide Indiana Bat Summer Survey Guidelines) and/or northern long-eared bats (based the Vermont Fish and Wildlife Department Regulatory Review Guidance for Protecting Northern Long-Eared Bats and Their Habitats).
3. Complete (100%) survey of the forested portion of the project area to be significantly altered or converted to non-forested habitat.
4. Each tree 4 inches diameter at breast height (DBH) or greater must be individually assessed using potential roost tree criteria. If the project does not pose a concern for impacts to northern long-eared bats based on distance from known summer or winter colonies and/or amount of tree clearing but is within Indiana bat range, only trees 12 inches DBH or greater must be assessed.
5. Potential roost tree criteria:
 - Cavity tree exhibiting any form of decay or excavation by primary producers (e.g., woodpeckers) that provides access to the interior of the bole
 - Cracks or crevices into which bats may roost, including black locust bark furrows
 - Peeling or exfoliating bark on the bole or branches
 - Live shagbark hickory or black locust
 - Total tree height must exceed 10 feet
6. Record data on all potential roost trees:
 - Tree species

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- Roosting features: cavity, crack, crevice, or exfoliating bark
 - Percentage of bark remaining
 - Percentage of crown remaining
 - Diameter at Breast Height
 - GPS Location
7. Submit a written report which confirms the surveyor's name and training/experience conducting such surveys, methods used, results, and a map of the location of each potential roost tree to Alyssa.bennett@vermont.gov

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Habitat Type		Conservation Measure	Land Use Guideline	USFWS Federal Nexus
Known, Occupied Hibernacula	Special Management Zone 1 (128 Acres)	Special Management Zone (SMZ)	0.25 mile radius from cave/mine entrance	0.25 mile radius from cave/mine entrance
		Prohibited Activities	Impact integrity of hibernaculum; Forest conversions > 2% of forested habitat	Impact integrity of hibernaculum; Any tree cutting
		No conservation measures necessary	Habitat Not Suitable ¹	
		Forest conversion < 1% of forested habitat ²	Seasonal Restrictions: No tree harvesting April 15 – October 31	
		Forest conversion > 1% of forested habitat ²	Seasonal Restrictions: No tree harvesting April 15 – October 31	
			Apply potential roost tree retention guidelines on project area	
			Minimize habitat and canopy fragmentation	
	Special Management Zone 2 (2010 Acres)	Special Management Zone (SMZ)	1.0 mile radius from cave/mine entrance	
		Prohibited Activities	Impact integrity of hibernaculum; Forest conversions > 2% of forested habitat ³	
		No conservation measures necessary	Habitat Not Suitable ¹	
		Forest conversion < 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – October 31 ⁵	
		Forest conversion > 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – October 31	
			Apply potential roost tree retention guidelines on project area	
			Minimize habitat and canopy fragmentation	

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Habitat Type		Conservation Measure	Land Use Guideline	USFWS Federal Nexus
Known, Occupied Summer Habitat	Special Management Zone 1 (128 Acres)	Special Management Zone (SMZ)	0.25 mile radius from roost trees, colony location	150 feet radius from known occupied roost trees
		Prohibited Activities	Harvest of known, occupied roost trees; Forest conversions > 2% of forested habitat ³	Harvest of known, occupied roost trees or any trees within 150 feet June 1 – July 31
		No conservation measures necessary	Habitat Not Suitable ¹	
		Forest conversion < 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – September 30	
		Forest conversion > 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – September 30	
			Apply potential roost tree retention guidelines on project area	
			Minimize habitat and canopy fragmentation	
	Special Management Zone 2 (2010 Acres)	Special Management Zone (SMZ)	1.0 mile radius from roost trees, colony location	150 feet radius from known occupied roost trees
		Prohibited Activities	Harvest of known, occupied roost trees; Forest conversions > 2% of forested habitat ³	Harvest of known, occupied roost trees or any trees within 150 feet June 1 – July 31
		No conservation measures necessary	Habitat Not Suitable ¹	
		Forest conversion < 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – September 30 ⁵	
		Forest conversion > 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – September 30	
			Apply potential roost tree retention guidelines on project area	
			Minimize habitat and canopy fragmentation	

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Habitat Type		Conservation Measure	Land Use Guideline	USFWS Federal Nexus
Potential Summer Habitat	Special Management Zone (2010 Acres)	Special Management Zone (SMZ)	1.0 mile radius around project site	
		No conservation measures necessary	Habitat Not Suitable; Forest conversion < 1% of forested habitat ⁴ ; Acoustic surveys demonstrate probable absence	Habitat Not Suitable; Acoustic surveys demonstrate probable absence
		Forest conversion > 1% of forested habitat ⁴	Seasonal Restrictions: No tree harvesting April 15 – August 31	
			Forest conversion limited to < 2% of forested habitat ³	
		Forest conversion > 2% of forested habitat ³	May be required to demonstrate probable absence ⁶ <u>OR</u> additional mitigation measures are taken	
Seasonal Restrictions: No tree harvesting April 15 – August 31 <u>OR</u> Demonstrate no probable presence				

¹ Habitat suitability includes tree diameters, tree species, canopy closure, and habitat isolation

² 1% of the 0.25 mile radius Special Management Zone equates to 1.25 acres in a completely forested Special Management Zone

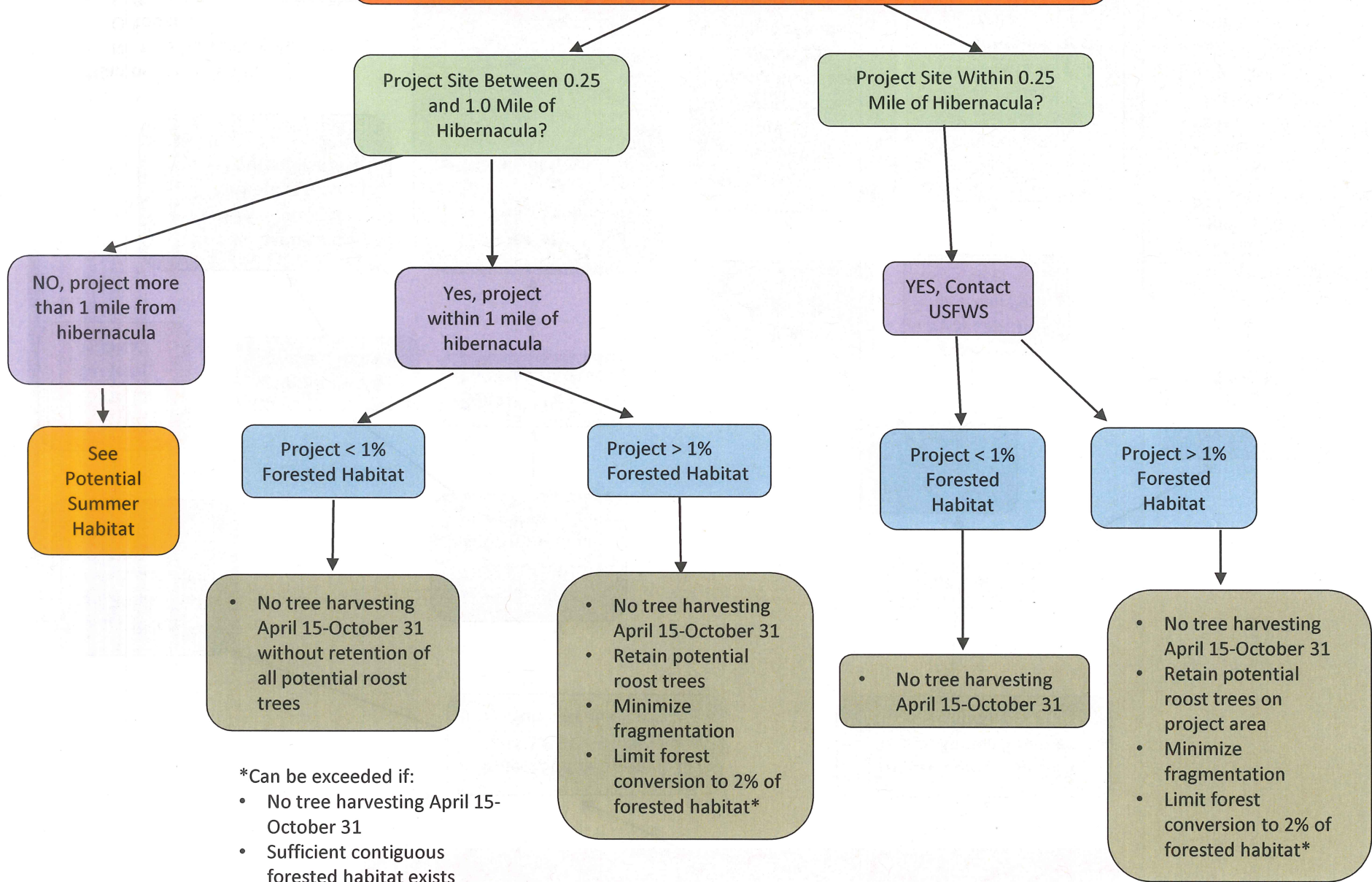
³ 2% of the 1.0 mile radius Special Management Zone equates to 40 acres in a completely forested Special Management Zone

⁴ 1% of the 1.0 mile radius Special Management Zone equates to 20 acres in a completely forested Special Management Zone

⁵ Seasonal restrictions may be waived upon completion of a survey for potential roost trees by a trained consultant that identifies, marks, and retains all potential roost trees

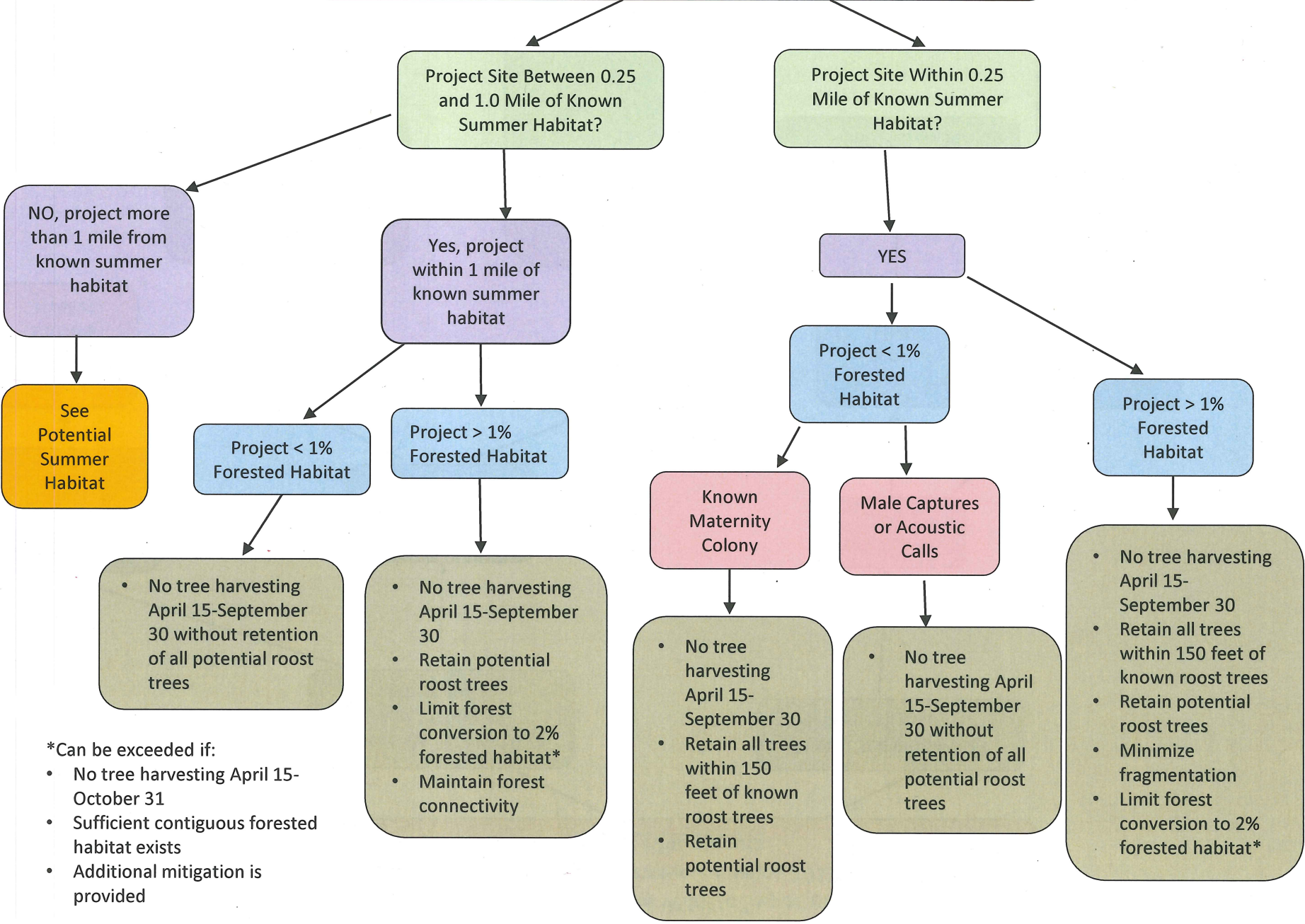
⁶ Project impacts exceeding 2% of forested habitat may be required to demonstrate probable absence of MYSE due to the large size of the impact

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- *Can be exceeded if:
- No tree harvesting April 15-October 31
 - Sufficient contiguous forested habitat exists
 - Additional mitigation is provided

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*Can be exceeded if:

- No tree harvesting April 15-October 31
- Sufficient contiguous forested habitat exists
- Additional mitigation is provided

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Potential MYSE Summer Habitat

