From:	Hoskin, Sumalee
To:	Tiernan Lennon; Barbara Douglas; Kimberly Smith
Cc:	Troy Andersen
Subject:	Fwd: Bat Mitigation / Conservation for MVP
Date:	Wednesday, May 18, 2016 2:30:31 PM
Attachments:	Indiana Bat Compensation and Conservation Measures

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Tiernan & Barb,
Kim and I thought we could start with the prioritized list that was developed for the FHWA Ibat/NLEB programmatic. I copied the section straight from the BA so there's references to transportation agencies and actions, see attached. Let us know what you think about the priorities in general then we can either arrange a conference call or start the conversation via email.
Sumalee

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---------- Forwarded message ----------
From: **Taina Pankiewicz** <TPankiewicz@envsi.com>
Date: Thu, Apr 14, 2016 at 5:35 PM
Subject: Bat Mitigation / Conservation for MVP
To: "Tiernan_Lennon@fws.gov" <Tiernan_Lennon@fws.gov>, "Sumalee Hoskin (sumalee_hoskin@fws.gov)" <sumalee_hoskin@fws.gov>
Cc: "Kimberly Smith (kimberly_smith@fws.gov)" <kimberly_smith@fws.gov>, "Troy Andersen (troy_andersen@fws.gov)" <troy_andersen@fws.gov>, Barbara Douglas <barbara_douglas@fws.gov>, "Neylon, Megan (MNeylon@eqt.com)" <MNeylon@eqt.com>

Hey ladies,

At our meeting last week there was talk about WV and VA collaborating together to identify a prioritized list of mitigation / conservation activities that MVP may undertake as part of the ESA Formal Consultation process for this project. Forgive me but I am just putting out a ***poke*** to hopefully beg attention on that matter as I know it will be an evolving process that will take time.

Thank you!

Taina

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1.1 Indiana Bat Compensation and Conservation Measures

Conservation Goal

The Transportation Agencies' conservation goal for this consultation is to offset adverse impacts to Indiana bats and promote the recovery of both bat species. The USFWS and the Transportation Agencies have developed compensatory mitigation measures and conservation priorities for implementation where projects using this consultation adversely affect Indiana bats. The Transportation Agencies will implement appropriate and practicable compensatory mitigation as described herein for adverse effects to Indiana bats. Although, these measures are not required for adverse effects on NLEB under this consultation, many of these measures will benefit NLEBs. USFWS developed these measures after considering the effects of the action and the recovery actions identified in the Draft Recovery Plan (first revision) for the Indiana bat (USFWS 2007).

Conservation Pathways (Options)

Transportation Agencies have several pathways (options) to compensate for adverse impacts to the Indiana bats. The conservation pathways include ILF programs, conservation banks, and local conservation sites. A Transportation Agency may choose any of the conservation pathways described below to meet the requirements of this consultation.

Range-wide In-lieu Fee Program

Transportation Agencies, federal resource agencies or conservation groups may develop a range-wide ILF program. Transportation Agencies may use any USFWS-approved range-wide ILF program.

The Conservation Fund (TCF), in coordination with the USFWS, is developing a range-wide ILF mitigation program for compensation of adverse effects to Indiana bat habitat. The ILF program will provide a compensatory mitigation option for project applicants participating in the range-wide programmatic consultation. TCF will serve as the Program Administrator. They will receive the compensation fees, administer the ILF program, and be responsible for ensuring that compensation project implementation is consistent with the requirements of this consultation.

State, Regional, Recovery Unit-Specific ILF Program

Transportation Agencies may use a USFWS-approved regional or local ILF program. Transportation Agencies, State transportation agencies, State resource agencies, and conservation groups may develop and use ILF programs. These programs may operate at the State, regional level, or recovery unit level, and must be approved by USFWS.

Conservation Banks

Transportation Agencies may use a USFWS-approved Indiana bat conservation bank appropriate for the Action Area of a project(s). Any individual or group may establish an Indiana bat conservation bank.

Local Conservation Sites

Transportation Agencies may work directly with local USFWS Field Offices to select specific mitigation projects for their individual projects or programs. If a compensation project provides more habitat than required to compensate for a single project's impacts, Transportation Agencies may use the excess acres for future projects.

Compensatory Mitigation Measures and Conservation Focus Areas

The Transportation Agencies will have flexibility in selecting conservation measures to meet the compensatory mitigation requirements in this consultation. This approach allows for a wide range of ecological conditions and opportunities across the range of the species. However, any funds collected for compensatory mitigation will be used on mitigation projects within the State where the funds originated unless the State agrees to use of funds for out-of-State mitigation projects. The amount of compensatory mitigation required is determined from the compensatory mitigation ratios given in the mitigation matrix (Table 3) in conjunction with the formula identified in Table 2 (Determination of Compensatory Mitigation).

USFWS has prioritized the compensatory mitigation and conservation actions based on the effects of the transportation program on Indiana bats and the conservation needs of Indiana bats. The goal of the conservation program is to implement the highest priority compensatory actions for a project where practicable. In some circumstances, USFWS may determine that a lower priority compensatory measure may provide a higher conservation value for Indiana bats in a given area or circumstance.

Transportation Agencies or conservation entities (ILFs, conservation banks, etc.) should collaborate with USFWS to establish Conservation Focus Areas (CFA). The purpose of establishing CFAs is to identify key areas in each State on which to focus conservation efforts. Transportation Agencies or conservation entities should consolidate compensatory mitigation requirements from multiple projects into larger CFAs to provide greater ecological benefits for Indiana bats, when practicable.

Conservation Focus Areas Establishment

State-specific CFAs will likely incorporate the different Indiana bat habitat types (e.g., *Summer Habitat CFAs*, *Winter Habitat CFAs*). Collectively, the State-specific CFAs should consist of large preservation areas in key landscapes for Indiana bat conservation and recovery.

The following criteria should be considered when delineating broader State-specific CFAs in support of the conservation goals and mitigation priorities identified in these guidelines. Ideally, CFAs should

- Be contiguous with one or more protected public or private lands that are known to support Indiana bat populations;
- Currently support populations of Indiana bats that are expected to contribute to long-term conservation efforts for the species;
- Contain adequate suitable habitat to support conservation efforts for Indiana bats;
- Provide opportunities for future protection, restoration, enhancement, and/or creation of additional summer and/or winter Indiana bat habitat; **and/or**
- Contain conditions that are generally expected to contribute to the persistence of Indiana bat populations and habitat into the future as determined by the appropriate USFWS Field Office.

The conservation priorities listed below focus on actions which are most beneficial to the species and ensure that effects considered in this consultation (i.e., impacts to individual bats and their summer roosting habitat) are adequately offset. Compensatory mitigation efforts will follow the highest priority option practicable unless there is a biological reason to select a lower priority option. Compensatory mitigation efforts should focus on protecting larger blocks of habitat (generally 50 acres or larger within a single maternity colony home range) and enhance and enlarge existing habitat blocks or provide connectivity across the landscape to achieve meaningful conservation.

PRIORITY 1

Protect/Restore Summer Habitat

- Summer habitat compensatory mitigation **must** be focused within a roughly 2.5-mile radius around the center of documented roosts or within a roughly 5-mile radius around the center of capture locations where the roosts are not documented (i.e., radio telemetry was not done or did not identify roost trees[1]).

- Summer habitat compensatory mitigation should focus on protecting larger blocks of occupied habitat, associated buffer areas, and connecting corridors. Compensation may include protection/restoration of roosting habitat, foraging habitat or corridors. If protection or restoration of corridors is used, the corridors must connect habitat patches of at least 20 acres of suitable habitat to ensure the corridors actually provide meaningful connectivity (Figure 1).

    - **Protection /Preservation** of suitable forested habitat within the maternity colony home range should focus on protecting forest within or adjacent to forest blocks with documented captures, roosts, telemetry, or acoustic detections, when this type of information is available.

[1] This distance may be larger or smaller for colonies with radio telemetry information that provides more detail on estimated home ranges, core roosting areas, foraging areas, and/or commuting areas.

- **Restoration** of forested habitat should focus on expanding forest patches within the maternity colony home range with documented captures, roosts, telemetry or acoustic detections. Restoration of summer habitat can meet compensatory mitigation requirements only where the forest cover within the maternity colony (2.5-mile or 5-mile radius circle) is less than 30%.

PRIORITY 2

Protect/Restore Staging/Swarming Forested Habitat

- Compensatory mitigation should occur within a roughly 5-mile radius around a P1 or P2 hibernaculum opening.

- Staging/swarming mitigation can include either protection alone or restoration with protection of the restored site. Protection will consist of existing forested habitat suitable for foraging Indiana bats. Restoration will consist of planting hardwood trees native to the area of the hibernaculum. Restoration should take precedence over protection around hibernacula where suitable forest habitat is limited as determined by the appropriate USFWS Field Office.

- Both protection and restoration mitigation sites must be located within roughly 1,000 feet of existing forested habitat or connected to existing habitat by a forested corridor.

- Staging/swarming compensatory mitigation can occur in specific cases around P3 and P4 hibernacula where: a) suitable forest within a 5-mile radius around P3 or P4 hibernacula is extremely limited as determined by the appropriate USFWS Field Office, or b) Indiana bats have shown resistance to white-nose syndrome (WNS) by persisting several years after WNS was recorded at the hibernaculum.

Protect/Manage Hibernacula[2]

- Protection of hibernacula can occur at any occupied Indiana bat hibernaculum subject to a known, existing threat. A known, existing threat is defined as the occurrence of one or more un-gated entrances, an entrance which is unstable and in danger of collapse, or other threats (e.g., contaminants) that can be successfully alleviated.

- In specific cases, restoration of a degraded, occupied hibernaculum can count towards offsetting impacts where, for example, changes to air or water flow has made the hibernaculum less suitable.

[2] Note that because of the sensitivity of hibernacula and the complexity of hibernaculum mitigation projects, mitigation involving hibernacula will require more extensive coordination with the local USFWS Field and Indiana bat experts.

- The conservation value of a particular hibernaculum proposed for protection depends on circumstances applicable to that particular site; therefore, standard multipliers are not provided and must be determined on a case-by-case basis. Factors that influence the value of a particular protection site include, but are not limited to: (1) the relative significance of the site to the conservation and recovery of Indiana bats; (2) the quality of the habitat; (3) the level of protection afforded; (4) the degree of risk to the site without the proposed mitigation measure; and (5) the site's position within the landscape (e.g., proximity to CFAs).

PRIORITY 3[3]

Protection of Potential Indiana Bat Conservation Lands

- If justified biologically and consistent with the rationale for the State-specific CFA, the local USFWS Field Office may allow for compensation in the form of protection of unoccupied Indiana bat habitat. This option can only be implemented when higher priority conservation options are not available within the three year compensation time frame.

- Prior to establishing Priority 3 CFAs, States should strive to identify new Indiana bat summer and/or winter occurrences via acoustic sampling, tracking of spring emergent females, targeted summer presence/probable absence surveys, or other approved methods.

- Preservation and restoration of habitats may also occur at locations outside of the CFAs in circumstances where the conservation benefits to Indiana bats can be clearly identified and documented in coordination with the USFWS.

Applied Research

- Applied research projects may be included in this conservation program if determined by USFWS to be the highest practicable conservation effort available or if the research is expected to provide substantial future conservation benefits. Applied research can yield specific information that will improve some aspect of the compensatory mitigation actions of this programmatic or overall conservation of the species. For example, surveys can be used to identify previously unknown maternity colonies or research studies can focus on ways to better protect hibernacula, such as more effective gating.

Compensatory Mitigation Calculation Method

The Indiana bat compensatory mitigation ratios and rationale are described below and shown in Table 3.

[3] Several factors may preclude implementation of Priority 1 or 2 compensatory mitigation actions, therefore each DOT and local USFWS Field Office should collaborate to define State-specific Priority 3 actions should they be necessary.

Table 1. Compensatory mitigation ratios for Indiana bat.

Project Location	<30% Forest Cover (within County)		≥30% Forest Cover (within County)	
	Active*	Inactive*	Active*	Inactive*
0-100 ft. edge of road/rail ballast	1.5	NLAA	1.25	NLAA
0-100 ft. edge of road/rail ballast – documented roosting/foraging habitat	2.25	1.75	2	1.5
100-300 ft. edge of road/rail ballast	2.25	1.75	2	1.5

*Consult with your USFWS Field Office to determine appropriate timeframes

USFWS developed the compensatory mitigation ratios to offset the adverse effects of actions on the Indiana bat and to guide conservation for the species. Several factors were considered when developing the mitigation ratios.

Compensatory mitigation ratios involved ranking the impact of a project on the species. Each box of the matrix was ranked from highest to lowest in terms of significance of the adverse effect, which allowed for determination of minimum and maximum mitigation ratios. The percent likelihood of an "all roost" occurrence within a certain distance of pavement (0-100 ft. = 3.5%; 100-300 ft. = 8.7%) was first considered (i.e., lower percent of occurrence equals a decrease in significance of the effect). Next, the timing of the habitat removal was considered (i.e., direct effects vs. indirect effects). Finally, percent forest cover/habitat availability was considered (i.e., less habitat equals increase risk to fitness of a maternity colony). By comparing these factors, USFWS discerned a hierarchy of effects and assigned ratios

USFWS used the Ohio (USFWS Field Office and Ohio DOT) habitat equivalency analysis (HEA) model to generate base multipliers that were applied to the rankings. HEA is a methodology used to estimate the appropriate level of compensation for impacts to natural resources. It is most commonly applied to natural resource damage assessment (NRDA) claims (Dunford, Ginn and Desvousges 2003). More recently it has been employed to rigorously estimate migratory bird and endangered species habitat impacts and the appropriate compensation (Jeff Gosse, USFWS, personal communication 04-05-16). Since "all roosting habitat" is considered within the programmatic consultation, the upper and lower bounds of mitigation were established using ratios of 2.25:1 and 1.25:1, respectively, as determined by the Ohio HEA model for "all roosting habitat" type impacts.

These ratios also reflect the nature of projects and general quality of habitat within 0 to 300 feet of the edge of road or rail ballast. This habitat has been, and continues to be modified and seldom reaches sufficient maturity to be suitable as maternity roosting habitat. This does not exempt the fact that roosting habitat and occasionally maternity roosting habitat occurs within this distance. These ratios are consistent with the range of mitigation implemented for individual projects across much of the range of the species. Multipliers were adjusted by rounding to the nearest quarter to account for the

increase/decrease in adverse effects on the species; intermediate steps were established using quarter steps. Thus, the mitigation ratios for the programmatic consultation are: 2.25, 2.0, 1.75, 1.5, and 1.25:1.

Determination of Compensatory Mitigation

Project proponents can use Table 2 to determine the amount of compensatory mitigation needed to offset project impacts. The project's impact(s) should be divided into the action or impact types (by location) and then quantified to yield the acreage of impact for each action.

Table 2. Calculation of Impact Acres and Compensatory Mitigation

ACTION / IMPACT TYPE	IMPACT ACRES	Compensatory Mitigation Ratio	Compensatory MITIGATION ACRES
Habitat Loss			
Select the Action/Impact Type based on location of the project from edge of pavement; documented occurrence information		Please see Table 1 to select appropriate multiplier based on location and timing of impact.	
Mitigation Measures			
Purchase, protect, restore or conserve hibernacula	Value determined on a case by case basis. Factors considered in value determination made include, but are not limited to: habitat type, habitat quality, landscape position.		
Research related project			
Summer habitat protection or restoration	(acres of impact)(ratio) = Total compensatory mitigation acres		
In-Lieu Fee Contribution	(acres of impact)(ratio)($/mitigation acre)[4](X% management fee, if applicable) = Total in-lieu fee contribution		

For impacts of less than 0.5 acre where it may be difficult to make an area measurement, but where compensatory mitigation is appropriate because of the quality of the habitat, Transportation Agencies should either estimate the area of canopy cover or count each suitable roost tree and multiply by 0.09 acre/tree to determine the acreage of suitable habitat loss (this is referred to as the Single Tree Method). Small area impacts lend themselves particularly well to advance mitigation through a crediting system. For impacts involving the loss or alteration of blocks of forested habitat, the acreage of the impact is determined by identifying the perimeter and area of the impact with GPS or GIS technology (i.e., the Habitat Block method).

[4] This dollar amount is subject to change based on each State's average value of farm real estate as published annually by the U.S. Department of Agriculture in the Land Values and Cash Rents document. Last released by the USDA in August 2015 (ISSN 1949-1867). Available at: http://www.usda.gov/nass/PUBS/TODAYRPT/land0815.pdf.

Once the acreage of habitat loss has been determined for each action using the Single Tree and/or Habitat Block method(s), the impact information should then be inserted into Table 2 and multiplied by the appropriate ratio to yield the amount of mitigation required for each action or impact type. This may require applying multiple habitat types and more than one ratio in Table 2 depending on the size and complexity of the project and the habitat in the project area. The local USFWS Field Office will assist project proponents in determining compensatory mitigation as necessary.

Timing of Mitigation Compliance

If a conservation bank or ILF option is chosen to compensate for adverse effects on Indiana bats, the purchase of species conservation credits and/or ILF contributions shall occur prior to construction of a transportation project covered under this programmatic consultation. The one exception will be projects determined to be emergency and/or projects that do not require a letting prior to construction. In these cases, purchase of credits and/or ILF contributions shall be completed within three months of completion of the project. This timeframe allows for accurate compilation of the acres of habitat affected as a result of the emergency project and processing of finances.

All required mitigation projects shall be implemented **within three years** of the transportation project's start of construction. This timeframe allows for the purchase and protection of habitats, initiation of restoration and/or enhancement of habitats, research related projects, etc. Implementing compensatory mitigation using any conservation pathway is preferable in advance of the impacts in order to avoid any temporal delays in conservation for the species.

Protection in Perpetuity

There are two options for permanently protecting spring, summer, fall, and/or winter habitat:

- Purchase or otherwise acquire fee title interest in one or more land parcels that meet the intents and priorities of this Conservation Program; and

- Secure perpetual conservation easements and associated land management agreements on one or more land parcels that meet the intents and priorities of this Conservation Program.

Easement or fee simple lands shall include all surface and where practical mineral rights to the property and clear and unencumbered ownership of these rights. The applicant or project proponent shall pay for all fees and/or other costs associated with title work, recording, transferring, surveying, and/or acquiring of the easement or property. Compensatory mitigation measures that involve land acquisition or easement require the donation of the property (or easement) to a conservation organization approved by the USFWS. A financial endowment should accompany the donation that is sufficient to provide perpetual management for the conservation of Indiana bat habitat (e.g., no timber harvest, development, intensive recreational use, etc.) and must include any other funds identified by the

receiving conservation organization that may be necessary for that entity to accept title or easement (e.g., contaminants surveys, fencing, trash removal, etc.) to the property.

Inter-State Mitigation

Projects involving impacts to Indiana bats in more than one State should coordinate with the USFWS Field Offices for each State to determine the appropriate compensation approach. Transportation Agencies may choose the specific conservation pathway to achieve compensatory mitigation. In some cases an applicable ILF or conservation bank may already be established for the multistate project.

Mitigation Implementation and Monitoring

Implementation

Forest Habitat Restoration

Indiana bats are known to use many species of trees for roosting and foraging (see Table 5 of the draft recovery plan for a list of roost tree species). A restoration project will include the following unless otherwise approved by USFWS:

- Include each of three categories of trees: softwoods, hardwoods, and cottonwood (*Populus deltoides*) where native. The percentage of each category can be determined by the individual restoration goals and the site conditions. Each category of trees should be included in the mix, if native to the site/area;

- Use trees native to the restoration site and that are locally adapted where practicable ;

- Generally plant seedlings using a minimum density of 544 trees per acre (8 x 10) spacing;

- Follow NRCS planting guidelines (see publication 612 Tree and Shrub Establishment) for site preparation, weed control, and type of trees (e.g., bare root seedlings) that are most suited to the restoration site.

Forest Habitat Protection

- sites will be protected sufficiently to ensure the persistence of key components of Indiana bat habitat including but not limited to mature and senescent trees; wetlands, streams or other water sources; and functional travel corridors;

- sites will be protected to preclude activities that will harm or disturb maternity colonies or staging/swarming bats including but not limited to development, intensive management (e.g.,

controlled burning except under a plan specific to protecting Indiana bats or improving Indiana bat habitat, and intensive recreation (e.g., off-road vehicle use or paved trails).

Winter Habitat Protection or Restoration

- A plan will be developed in conjunction with and authorized by the appropriate Service field office detailing the goal (s), measurable objectives, specific actions to achieve those objectives, and identified risks of any project involving work at a hibernaculum;

- A qualified bat biologist in coordination with the local Service field office will supervise any protection or restoration of a hibernaculum;

- All protocols relevant to white-nose syndrome (WNS) will be adhered to.

Monitoring

The following are guidelines for monitoring compensatory habitat mitigation habitat under this range-wide programmatic consultation. Variations are permissible to account for the geographic location of the compensatory mitigation and /or the specific characteristics of the restoration site. Site monitoring is required to ensure that the compensatory mitigation was implemented according to the guidelines.

Forest restoration sites will be monitored/assessed:

- To provide initial confirmation that the site was planted using an appropriate species mix (the appropriate USFWS Field Office will provide review and recommendations concerning the species mix);

- To confirm at least a 70% survival rate of planted species at 3 years and again at 7 years or to confirm a minimum stand density of planted and volunteer native trees equal to at least 70% of the planted density (e.g., planting on 8 x 10 spacing = 544 trees / acre and 70% is 381 native trees per acre);

- To determine whether or not invasive species threaten the function of the mitigation site as Indiana bat habitat – at Year 7 assess the site and if so these must be controlled to remove that threat between years 7 and 10.

Forest protection sites will be monitored/assessed:

- To ensure all mitigation requirements (see Priority 1) have been met prior to acceptance of the site as compensatory mitigation.

Winter habitat mitigation sites will be monitored/assessed:

Cave Gating

- To determine whether or not the newly installed gate is affecting egress/ingress and/or swarming behavior of bats at the entrance of the cave by a qualified bat biologist using night-vision equipment during fall migration and fall swarming in the first autumn after the gate is installed;

- To establish the security of the gate digital photographs will be taken of the cave entrances and gates as part of a security inspection that will occur at least yearly in September or October - any identified breaches in gate security will be reported to the Service within 48 hours;

- To document the effectiveness of the gate, where practical speloggers and dataloggers should be installed inside the gate and checked annually between April 1 and May 31.

Other Winter Habitat Mitigation (e.g., restoring air flow, repairing structural problems, addressing flooding or contaminants issues)

- To document that the mitigation action (e.g., stabilizing a mine entrance) was completed according to specifications;

- To regularly evaluate the structural or functional integrity of the action;

- To verify the implementation or function of any other essential components of the mitigation as determined by the appropriate Service field office.

All compensatory habitat mitigation sites will be monitored/assessed:

- Provide an initial assessment/confirmation that the habitat slated for protection is suitable based on USFWS guidelines for summer foraging or roosting habitat; spring swarming/fall staging habitat, or winter habitat protection;

- Managers/Operators of habitat compensation sites will confirm that the compensation is extant and that the compensatory mitigation requirements (e.g. site is being adequately protected) are being met at year two, and at year five after the site's establishment. The monitoring may be done by site visits or remote sensing.

ILF programs and conservation banks will assess if maternity colonies (and/or hibernacula population, if applicable) are extant at the compensatory mitigation location(s). The monitoring program will be outlined in the banking instrument or ILF agreement. USFWS and Transportation Agencies will use the monitoring information to evaluate the effectiveness of the conservation strategy and determine if the

conversation strategy should be revised. Note that if the maternity colonies or hibernacula populations are no longer extant at the conservation sites, the compensatory mitigation completed or in-progress will not be affected (voided), provided the sites followed the appropriate site establishment and protection criteria.

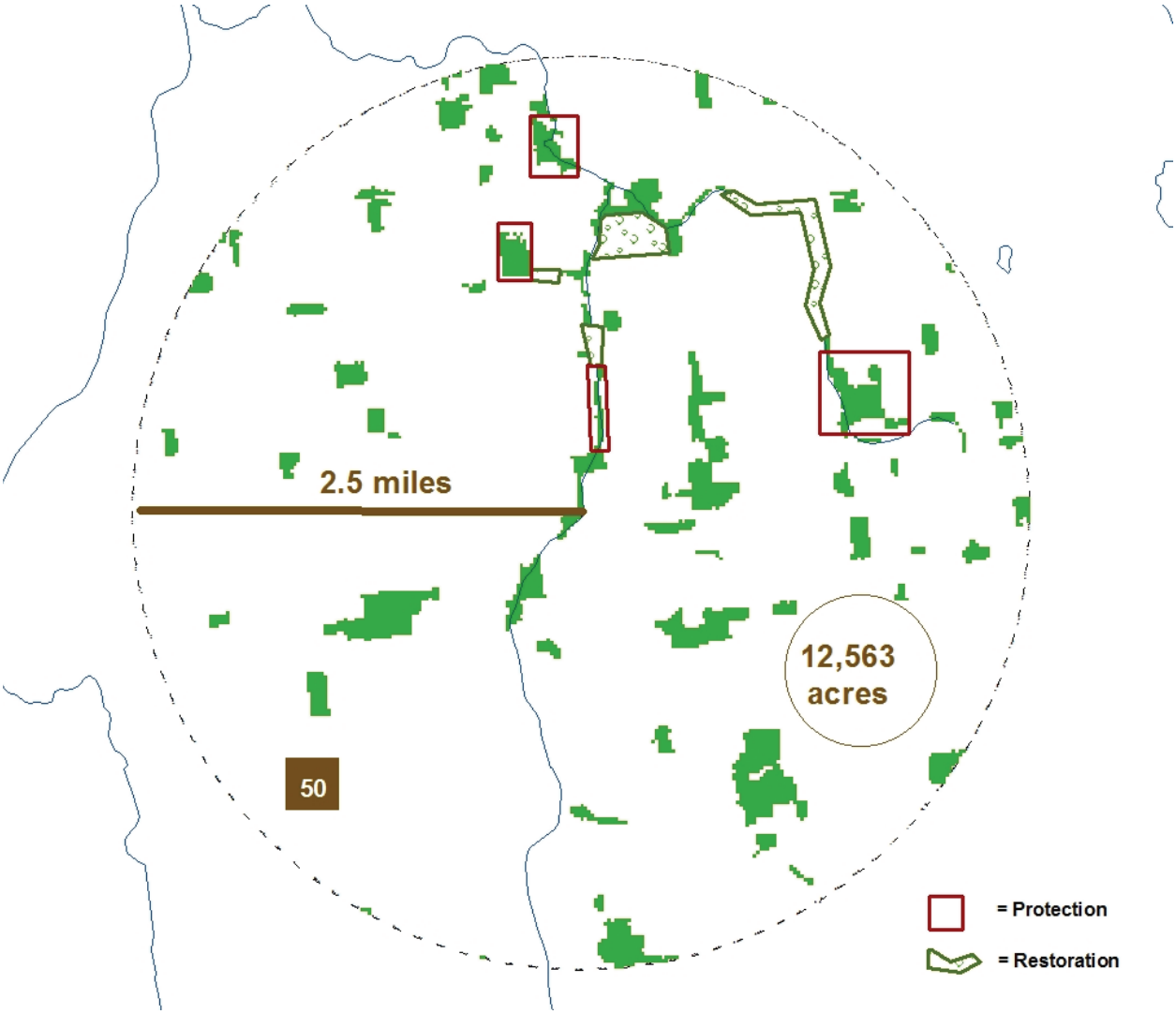

Figure 1. Maternity colony home range (2.5-mile radius circle) that is habitat limited and particularly appropriate for habitat restoration - potential restoration and protection of roosting, foraging, and corridor habitat is shown.

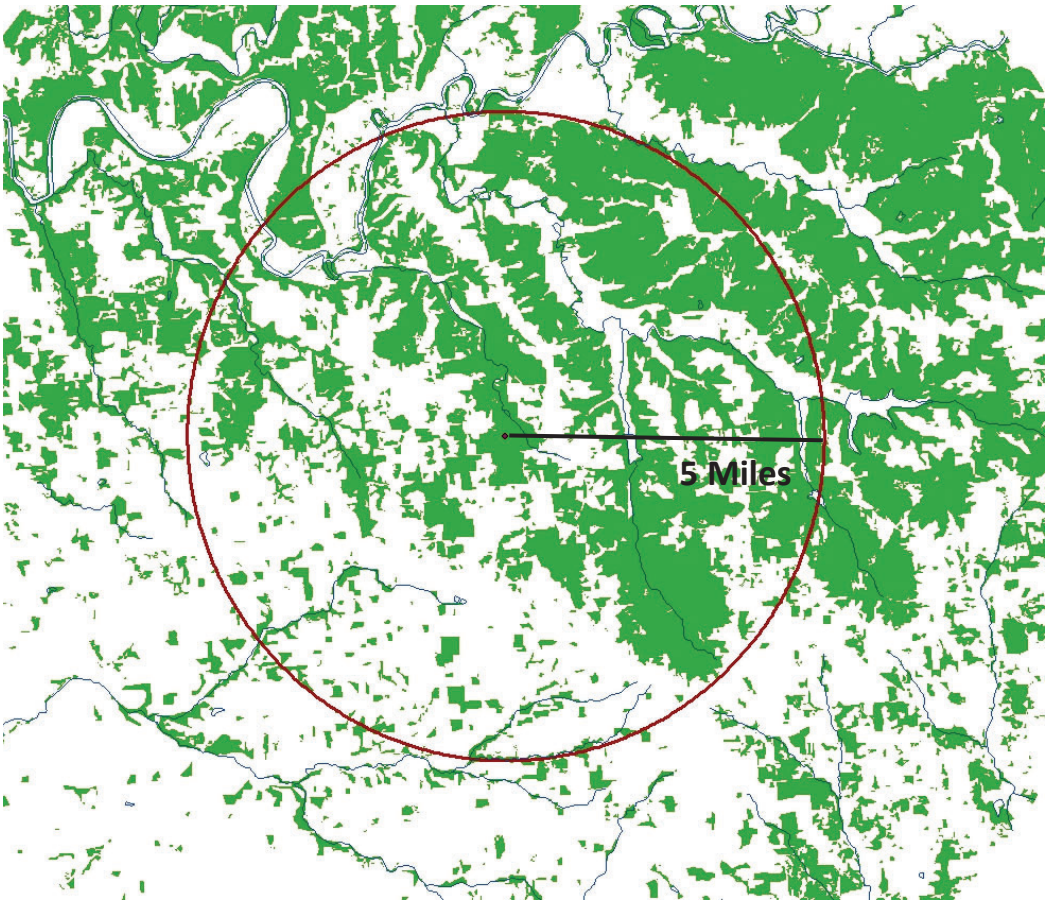

Figure 2. Five-mile buffer around a hibernaculum showing a landscape suitable for protection or restoration of staging/swarming habitat.