Stantec

Memo

To:	Marc-Antoine Dufresne EMD-Batimo Coordonnateur Acquisition et Vérification diligente	From:	Brennan Obermayer Ottawa, ON
File:	160925112	Date:	February 2, 2022

Reference: 150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment

INTRODUCTION

EMD Construction and Batimo Promoteur et Gestionnaire Immobilier (EMD-Batimo) has retained Stantec Consulting Ltd. (Stantec) to complete a species at risk (SAR) Bat Maternity Roost Habitat Suitability Assessment in support of the proposed development of 150 Kanata Avenue and 1200 Canadian Shield Avenue, Kanata, Ontario (18T 429019E, 5018170N; the Site; **Attachment A**) within the City of Ottawa (the City).

The Site is comprised mostly of a Dry-Fresh Sugar Maple – Ironwood Deciduous Forest type ELC community (FODM5-4). It is dominated by sugar maple (*Acer saccharum*) with an abundance of ironwood (*Ostrya virginiana*). Additional tree species were intermittently present throughout the Site including white birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), northern red oak (*Quercus rubra*), butternut (*Juglans cinerea*), poplar sp. (*Populus* sp.), basswood (*Tilia americana*), black cherry (*Prunus serotina*), and eastern white pine (*Pinus strobus*). The understory vegetation density is relatively open throughout the Site. Deciduous Thicket (THD), mostly vegetation clearing regeneration along the City's Canadian Sheild Avenue road right-of-way, is also present at the northeast portion of the Site. Business Sector (CVC_1), Transportation (CVI_1), Residential (CVR_1), Oak – Red Maple – Pine Non Calcareaous Trees Rock Barren Type (RBTB2-3), and Dry-Fresh Deciduous Woodland Ecosite (WODM4) communities were all present within 50m of the Site (the Study Area).

EMD-Batimo will require the removal and pruning of trees as a part of their planned development. To evaluate the potential impact this could have on SAR bats, a SAR Bat Maternity Roost Habitat Suitability Assessment was completed.

METHODS

The SAR Bat Maternity Roost Habitat Suitability Assessment was completed following the guidance in the Ministry of Northern Development, Mines, Natural Resources and Forestry's (NDMNRF) *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (NDMNRF 2017; **Attachment B**). The assessment was completed within, and adjacent to (50m) the Site.

As outlined in the NDMNRF's survey protocol, any tree with a DBH of 10 cm or greater is considered to provide potential bat maternity roost habitat, however, trees with DBH of 25 cm or greater, and with a large amount of loose, peeling bark, cavities, or crevices at least 10 m high, and exhibiting the early stages of decay are considered to have higher suitability for maternal bat roosting (NDMNRF 2017).

Stantec biologists traversed the Site during leaf-off conditions (December 21, 2021) to identify the best candidate roost trees, greater than or equal to 25-cm diameter at breast height (DBH), that meet the following criteria:

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

- Tree is one of the tallest snag/cavity trees in the survey area
- Tree exhibits cavities/crevices
- Tree has the largest DBH
- Tree is within the highest density of snags/cavity trees
- Tree has a large amount of loose, peeling bark
- The cavity/crevice is located high in the snag/tree (i.e., greater than or equal to 10 m high on tree trunk)
- The tree canopy cover is relatively open
- The tree exhibits early stages of decay (i.e., decay Class 1 to 3)

The best candidate trees were identified, marked and recorded using ArcGIS Collector and a Trimble R1 device to unsure <1m spatial accuracy. **Attachment A** shows the locations of the best candidate roosting trees and **Attachment C** shows the photographic record of the Site visit.

RESULTS

Seventeen potential snags/cavity trees were identified within the Site, all of which were within the FODM5-4 vegetation community (5.12 suitable maternal bat roost trees / ha) and were mapped on **Attachment A**. The 17 suitable bat maternity roosts were comprised of seven different tree species and, along with suitability assessment details, are identified in **Table 1**.

Table 1: Suitable SAR Bat Maternity Roosting Trees

Tree ID	Latin Name	Common Name	Health	DBH (cm) 1	DBH (cm) 2	Cavities	High Cavity	In High Density Cavity Trees	Peeling Bark	Open Canopy	Decay	Large DBH	Tall Tree	Sum of Yes	Site or Story Area (50 m of Site)
T01	*Pinus strobus*	Eastern White Pine	Dead (no live branches)	92	0	Yes	No	Yes	Yes	No	Yes	Yes	No	5	Study Area
T02	*Prunus serotina*	Wild Black Cherry	Good (full canopy)	78	0	No	No	Yes	Yes	No	Yes	Yes	No	4	Study Area
T03	*Acer saccharum*	Sugar Maple	Good (full canopy)	84	74	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	7	Study Area
T04	*Tilia americana*	American Basswood	Good (full canopy)	72	0	Yes	No	Yes	No	No	Yes	Yes	Yes	5	Study Area
T05	*Acer saccharum*	Sugar Maple	Good (full canopy)	66	0	Yes	Yes	Yes	Yes	No	Yes	Yes	No	6	Study Area
T06	*Betula alleghaniensis*	Yellow Birch	Good (full canopy)	90	0	Yes	No	Yes	Yes	No	Yes	Yes	Yes	6	Study Area
T07	*Fagus grandifolia*	American Beech	Good (full canopy)	56	0	Yes	Yes	Yes	No	No	Yes	No	No	4	Site
T08	*Juglans cinerea*	Butternut	Good (full canopy)	44	0	Yes	No	Yes	No	No	Yes	No	No	3	Study Area
T09	*Acer saccharum*	Sugar Maple	Good (full canopy)	57	0	Yes	Yes	Yes	No	No	Yes	No	No	4	Site
T10	*Acer saccharum*	Sugar Maple	Good (full canopy)	88	0	Yes	Yes	Yes	No	No	Yes	Yes	Yes	6	Study Area
T11	*Acer saccharum*	Sugar Maple	Good (full canopy)	85	0	Yes	Yes	Yes	No	No	Yes	Yes	Yes	6	Study Area
T12	*Pinus strobus*	Eastern White Pine	Dead (no live branches)	62	0	Yes	No	Yes	No	No	Yes	Yes	No	4	Site
T13	*Juglans cinerea*	Butternut	Fair (but >50% healthy canopy)	54	47	Yes	No	Yes	No	No	Yes	No	Yes	4	Study Area
T14	*Juglans cinerea*	Butternut	Fair (but >50% healthy canopy)	51	0	No	No	Yes	Yes	No	Yes	No	Yes	4	Site

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

Table 1: Suitable SAR Bat Maternity Roosting Trees

Tree ID	Latin Name	Common Name	Health	DBH (cm) 1	DBH (cm) 2	Cavities	High Cavity	In High Density Cavity Trees	Peeling Bark	Open Canopy	Decay	Large DBH	Tall Tree	Sum of Yes	Site or Story Area (50 m of Site)
T15	*Acer saccharum*	Sugar Maple	Fair (but >50% healthy canopy)	63	0	Yes	Yes	Yes	Yes	No	No	Yes	Yes	6	Site
T16	*Acer saccharum*	Sugar Maple	Fair (but >50% healthy canopy)	43	0	Yes	Yes	Yes	No	No	Yes	No	No	4	Site
T17	*Acer saccharum*	Sugar Maple	Fair (but >50% healthy canopy)	57	0	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6	Site

CONCLUSION

Seven trees were assessed within the Site as suitable bat maternity roost habitat for SAR bats, and an additional 10 suitable trees were present within 50 m of the Site. The Committee on the Status of Species at Risk in Ontario (COSSARO) identifies northern myotis as requiring interior forest habitat (COSSARO 2012), and although eastern small-footed bats are less forest dependent, they will often forage in forests. Given the size of the woodlot, maternal roosting northern myotis and eastern small-footed myotis are unlikely, however the suitable maternal roosting trees identified could be used by little brown myotis and tri-colored bat. The federal recovery strategy does not identify maternity roosts as critical habitat for bats. Hibernacula, which are defined as critical habitat (Environment and Climate Change Canada 2015), were not identified during the investigation as occurring within, or adjacent to, the Site.

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

REFERENCES

COSSARO. 2012. COSSARO candidate species at risk evaluation for Northern Myotis (*Myotis septentrionalis*) [formerly Northern Long-eared Bat]. Committee on the Status of Species at Risk in Ontario.

Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa.

MNRF (Ministry of Natural Resources and Forestry). 2016. Bats and Bat Habitat Surveys of Treed Habitats. Ontario Ministry of Natural Resources, Guelph District Office, Guelph, Ontario.

Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat (NDMNRF 2017

Regards,

Stantec Consulting Ltd.

Digitally signed by Obermayer, Brennan
Date: 2022.02.10 14:17:29 -05'00'

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Attachment: A – Figures
B – Survey Protocol for Species at Risk bats within Treed Habitats (2017)
C – Photographic Record

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

ATTACHMENT A

Figures

Stantec

Legend

- Site Boundary
- Study Area
- Wooded Area
- Bat Maternity Roost Tree

CVC_1- Business Sector

CVI_1- Transportation

CVR_1- Low Density Residential

FODM5-4- Dry-Fresh Sugar Maple-Ironwood Deciduous Forest Type

RBTB2-3- Oak – Red Maple – Pine Non-Calcareous Treed Rock Barren Type

THD- Deciduous Thicket

WODM4- Dry - Fresh Deciduous Woodland Ecosite

0 50 100 metres

1:1,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Orthoimagery © First Base Solutions, 2022. Imagery Date, 2018.

Project Location
City of Ottawa

160925112 REVA
Prepared by RS on 2022-02-02
Technical Review by DH on 2022-02-02

Client/Project
EMD-BATIMO
SAR AND SAR HABITAT ASSESSMENT AT 150 KANATA

Figure No.
1

Title
SAR and SAR Habitat assessment

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

ATTACHMENT B

Survey Protocol for Species at Risk bats within Treed Habitats (2017)

Survey Protocol for Species at Risk Bats within Treed Habitats

Little Brown Myotis, Northern Myotis & Tri-Colored Bat

April 2017

Ontario Ministry of Natural Resources and Forestry

Guelph District

Ontario

Introduction

This document describes Guelph District's recommended protocol for confirming presence/absence of Little Brown Myotis, Northern Myotis and Tri-colored Bat, where it is determined that suitable habitat for the establishment of maternity roosts is present.

This document replaces any previous versions of the survey protocol, and may be updated periodically as new information becomes available.

Note that those undertaking projects that may impact anthropogenic structures and isolated trees considered suitable habitat for bats should refer to Guelph District's *Survey Methodology for the Use of Buildings and Isolated Trees by Species at Risk (SAR) Bats*.

Little Brown Myotis (*Myotis lucifugus)*, Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) are listed as provincially endangered and receive species and general habitat protection under the *Endangered Species Act, 2007* (ESA).

Where the habitat of an endangered or threatened species is not prescribed by regulation, the ESA defines habitat as an area on which a species depends on, directly or indirectly, to carry out its life processes. Such processes include reproduction, rearing, hibernation, migration or feeding, as well as places being used by members of the species.

Throughout eastern North America, a disease known as white-nose syndrome (WNS), which is caused by the fungus *Pseudogmnoascus destructans*, is the primary cause of the decline of Little Brown Myotis, Northern Myotis and Tri-colored Bat populations. Where population numbers have significantly decreased due to WNS, the relative magnitude of other threats (e.g., habitat destruction) may increase. This is because the mortality or displacement of a small number of the remaining individuals can have a major impact on the survival of local populations and their recovery.

Many bat species are known to have high fidelity to their hibernacula and maternity roost sites. It is not uncommon for bats to return to the same roost tree or group of trees in successive years. Some bats switch roost trees periodically within the same treed area over the summer, likely to avoid predators or parasites or in search of a warmer or cooler roost.

Of the SAR bats species noted in this protocol, Little Brown Myotis is the most frequently encountered species in treed communities due to higher population numbers relative to other SAR bat species. Little Brown Myotis establishes maternity roosts within tree cavities and under loose or exfoliating bark, especially in wooded areas located near water. Foraging habitat includes over water and in open areas between water and forest. Favoured prey consists of aquatic insects (e.g., mayflies, midges, mosquitos and caddisflies). In agricultural environments, Little Brown Myotis tend to follow linear wooded features, such as hedgerows, for commuting and foraging.

Northern Myotis is less frequently encountered relative to Little Brown Myotis but selects similar maternity roost space. Northern Myotis roosts within tree crevices, hollows and under the bark of live and dead trees, particularly when trees are located within a forest gap. Northern Myotis switch roost trees more frequently compared to other SAR bat species (i.e., every 1-5 days) and are relatively

slow flyers. Northern Myotis is adapted to hunting in cluttered environments, such as within the forest along edges, where it gleans and hawks its prey (primarily moths).

Tri-coloured Bat establishes maternity roosts within live and dead foliage within or below the canopy. Oak is the preferred roost tree species, likely because oaks retain their leaves longer than other trees. Maples are also thought to be important for roosting, although maples are selected far less often compared to oaks. Some studies have shown that Tri-colored Bat prefers dead leaves over live leaves, especially if the dead leaves are situated on a live tree i.e., along a broken branch. Other documented roost sites include dogwood leaves, within accumulations of pine needles, in squirrel nests and in tree cavities. Within a forest, the location of maternity roost trees varies from dense woods to more open areas, although roosts are rarely found in deep woods. Although Tri-colored Bat switches roosts over the summer, this species has very high site fidelity to particular leaf clusters within a season. Foraging occurs along forested riparian corridors, over water (e.g., ponds and rivers) and within gaps in forest canopies. This species is an insect generalist, feeding on species such as leafhoppers, ground beetles, flies, moths and flying ants. The Tri-colored Bat is less frequently encountered compared to Little Brown Myotis and Northern Myotis. Unlike other SAR bats, Tri-colored Bat rarely roosts in buildings, and therefore relies heavily on treed areas for rearing its young.

Note: Confirmation of individual maternity roost trees is extremely challenging. Exit surveys are not always reliable, since SAR bats are known to periodically switch roost trees within a treed area over the summer. In addition, techniques used to confirm maternity roost trees, such as mist netting, are quite invasive and therefore not recommended.

The survey protocol that follows focuses on confirming presence/absence of Little Brown Myotis, Northern Myotis and Tri-colored Bat within treed habitats considered suitable for the establishment of maternity roosts, which is sufficient information to apply species and habitat protection under the ESA.

If an Ecological Land Classification (ELC) ecosite is determined to be suitable for the establishment of maternity roosts, trees with suitable attributes are present, and SAR bats are detected during the maternity roost season (June), it can be concluded with a high degree of certainty that the ELC ecosite represents the habitat most in use during the breeding season for roosting, feeding, rearing of young and resting.

Phase I: Bat Habitat Suitability Assessment

Little Brown Myotis, Northern Myotis and Tri-colored Bat establish maternity roosts in treed areas consisting of deciduous, coniferous or mixed tree species. For bats that roost under bark or within cracks, hollows or crevices, tree species is important only as it relates to its structural attributes. For example, trees that retain bark for longer periods or are more susceptible to fungal infections/attract cavity excavators are more likely to provide appropriate roosting space.

Following the completion of ELC mapping of a study area, any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10cm diameter-at-breast height

(dbh) should be considered suitable maternity roost habitat. For cultural treed areas, such as plantations, consultation with the Ministry of Natural Resource and Forestry (MNRF) is recommended to determine if these habitats may be suitable for the species.

If suitable habitat is to be impacted by a proposed activity, project proponents should proceed to Phase II. It is recommended that the proponent contact the MNRF to discuss the need for additional work with respect to SAR bats.

Phase II: Identification of Suitable Maternity Roost Trees

As previously described, Tri-colored Bat primarily roosts in tree foliage (mainly oak), while Little Brown Myotis and Northern Myotis select loose bark, cracks and cavities. Because of these differences, two separate field data sheets should be completed by the proponent to identify and map suitable roost trees for Tri-colored Bat (Appendix A) and Little Brown Myotis/Northern Myotis (Appendix B). The data collected in Phase II will help inform the positioning of acoustic monitoring stations in Phase III.

The timing of field visits is important in order for an observer to be able to clearly identify tree attributes that are suitable for the establishment of maternity roosts:

- **Tri-colored Bat**: field visits should take place during the leaf-on season the same year that acoustic monitoring is to be conducted so that foliage characteristic (i.e., dead/dying leaves along a dead branch) can be observed.

- **Little Brown Myotis/Northern Myotis**: field visits should occur during the leaf-off period so that the view of tree attributes (hollows, cracks etc.) is not obscured by foliage.

Note that for large ecosites (e.g., >10 ha) where a thorough walk-through may not be possible or practical, the proponent should discuss the study design for Phase II with the MNRF prior to undertaking field work.

i) Tri-colored Bat

Leaf roosts are shaped like umbrellas with a “roof” and a hollow core where bats rest. Studies have shown that oak leaves are the preferred roost site. Maple leaves are also selected, although less commonly. It is thought that Tri-colored Bat may prefer roost trees in open woodlands, as opposed to deep woods.

Within each ecosite identified as suitable maternity roost habitat in Phase I, the following trees should be documented on the field data sheet (Appendix A)

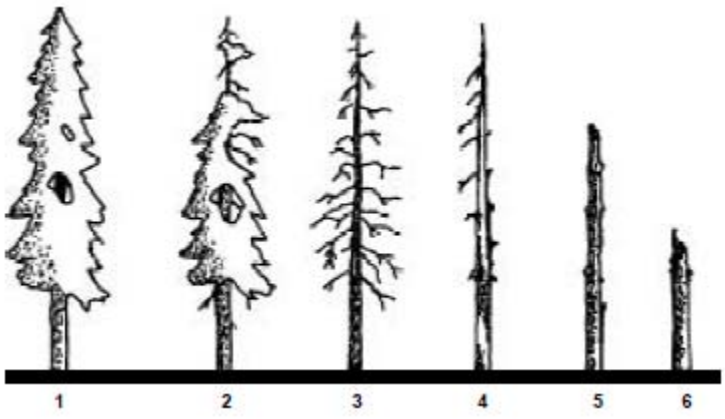
- any oak tree ≥10cm dbh
- any maple tree ≥10cm dbh IF the tree includes dead/dying leaf clusters
- any maple tree ≥25cm dbh

ii) Little Brown Myotis and Northern Myotis

Within each ecosite identified as suitable maternity roost habitat in Phase I, all “snags” should be identified and relevant information recorded on the field data sheet provided in Appendix B.

For purposes of this exercise, a "snag" is any standing live or dead tree ≥10cm dbh with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark.

During the field visit, the Decay Class should be noted for each snag (see Figure 1). Snags in an early stage of decay (which also includes healthy, live trees) may be preferred by Little Brown Myotis and Northern Myotis if suitable attributes for roost space are present. However, since SAR bats will also roost in snags outside of Class 1-3, any snag >10cm dbh with suitable roost features should be documented. For trees with cavities, the entrance can be high or low ("chimney-like") on the tree.



1. Healthy, live tree
2. Declining live tree, part of canopy lost
3. Very recently dead, no canopy, bark intact, branches intact
4. Recently dead, bark peeling, only large branches intact
5. Older dead tree, 90 percent of bark lost, few branch stubs, broken top
6. Very old dead tree, advanced decay, no branches, parts of the stem have rotted away

Figure 1: Snag classification (Decay Class 1-3 is considered an early decay stage)[1]

In addition, proponents should be aware that some tree species, such as shagbark hickory, silver maple and yellow birch, have naturally exfoliating bark that may be suitable for establishing maternity roosts. Trees ≥10cm dbh exhibiting these characteristics should be considered "snags" as per the definition above and included on the field data sheet provided in Appendix B.

Note: For efficiency (especially for larger ecosites e.g., >10 ha), a proponent may choose to undertake snag density surveys while conducting the work required in Phase II. For a detailed methodology, refer to Phase IV of this protocol.

[1] Watt, Robert and Caceres, M. 1999. Managing snags in the Boreal Forests of Northeastern Ontario. OMNR, Northeast Science & Technology. TN-016. 20p.

Phase III: Acoustic Surveys

Within each ELC ecosite determined to be suitable maternity roost habitat in Phase I, acoustic surveys are recommended to confirm presence/absence of Little Brown Myotis, Northern Myotis and Tri-colored Bat. As described below, acoustic detectors should be placed in the best possible locations in order to maximize the probability of detecting all three SAR bats species. The data collected in Phase II should be used to select optimal locations for monitoring. The trees to be targeted for acoustic monitoring will typically be a subset of the trees documented in Phase II.

Density and Optimal Location of Acoustic Monitoring Stations:

Multiple stations may be required to cover an ecosite adequately (see example in Figure 2). Based on the microphone range of most broadband acoustic detectors (20-30m), **4 stations/hectare** is needed for full coverage of an ELC ecosite.

Strategic placement of acoustic detectors is critical for the successful isolation of high-quality bat calls. Recommended positioning is to locate acoustic detectors **within 10m of the best potential maternity roost trees**. To increase the probability of detecting all three SAR bat species, detectors should be divided proportionally to target suitable roost trees (if present) for Tri-colored Bat and Little Brown Myotis/Northern Myotis.

Prior to undertaking acoustic surveys, it is recommended that the proponent discuss the proposed location of acoustic monitoring stations with the MNRF.

(i) Tri-colored Bat

Although Tri-colored Bat will roost within both live and dead foliage, it appears that reproductive females may prefer clusters of dead leaves, especially if they are situated on a live tree. Using the information collected on the field data sheet (Appendix A), the best suitable maternity roost trees for Tri-colored Bat should be selected according to the following criteria (in order of importance):

If oaks are present:

- Live oak with dead/dying leaf clusters
- Dead oak with retained dead leaf clusters
- Live oak (no dead leaf clusters) with the largest dbh (>25cm)
- Oak within a forest gap

If oaks are absent:

- Live maple with dead/dying leaf clusters
- Dead maple with retained dead leaf clusters
- Live maple (no dead leaf clusters) with the largest dbh (>25cm)
- Maple within a forest gap

Note that if a cluster of tree species with attributes preferred by Tri-colored Bat is present, this may be a good area to target acoustic monitoring.

(ii) Little Brown Myotis and Northern Myotis

Bats that roost under tree bark or within crevices or cavities frequently select the tallest and largest diameter snags, which often extend above the forest canopy. This is because larger snags better retain solar heat, which benefits the pups. Tall trees within a forest gap or along an edge may also have a less obstructed flight approach for bats.

Using the information collected on the field data sheet completed in Phase II, the best suitable maternity roost trees for Little Brown Myotis/Northern Myotis should be selected using the following criteria (in order of importance):

- Tallest snag
- Snag exhibits cavities/crevices often originating as cracks, scars, knot holes or woodpecker cavities
- Snag has the largest dbh (>25 cm)
- Snag is within the highest density of snags (e.g., cluster of snags)
- Snag has a large amount of loose, peeling bark (naturally occurring or due to decay)
- Cavity or crevice is high on the tree (>10 m) or is “chimney like” with a low entrance
- Tree is a species known to be rot resistant (e.g., black cherry, black locust)
- Tree species provides good cavity habitat (e.g., white pine, maple, aspen, ash, oak)
- Snag is located within an area where the canopy is more open
- Snag exhibits early stages of decay (Decay Class 1-3)

Note: The sole purpose of the above-listed criteria is to determine the best placement of acoustic monitors in order to maximize the probability of detecting Little Brown Myotis and Northern Myotis. The listed criteria are NOT intended for any type of snag “ranking”. Snags that do not include any of the above characteristics may still be used as a maternity roost site. For example, the absence of snags >25 cm dbh by no means indicates that there is no potential maternity roost habitat present on a site.

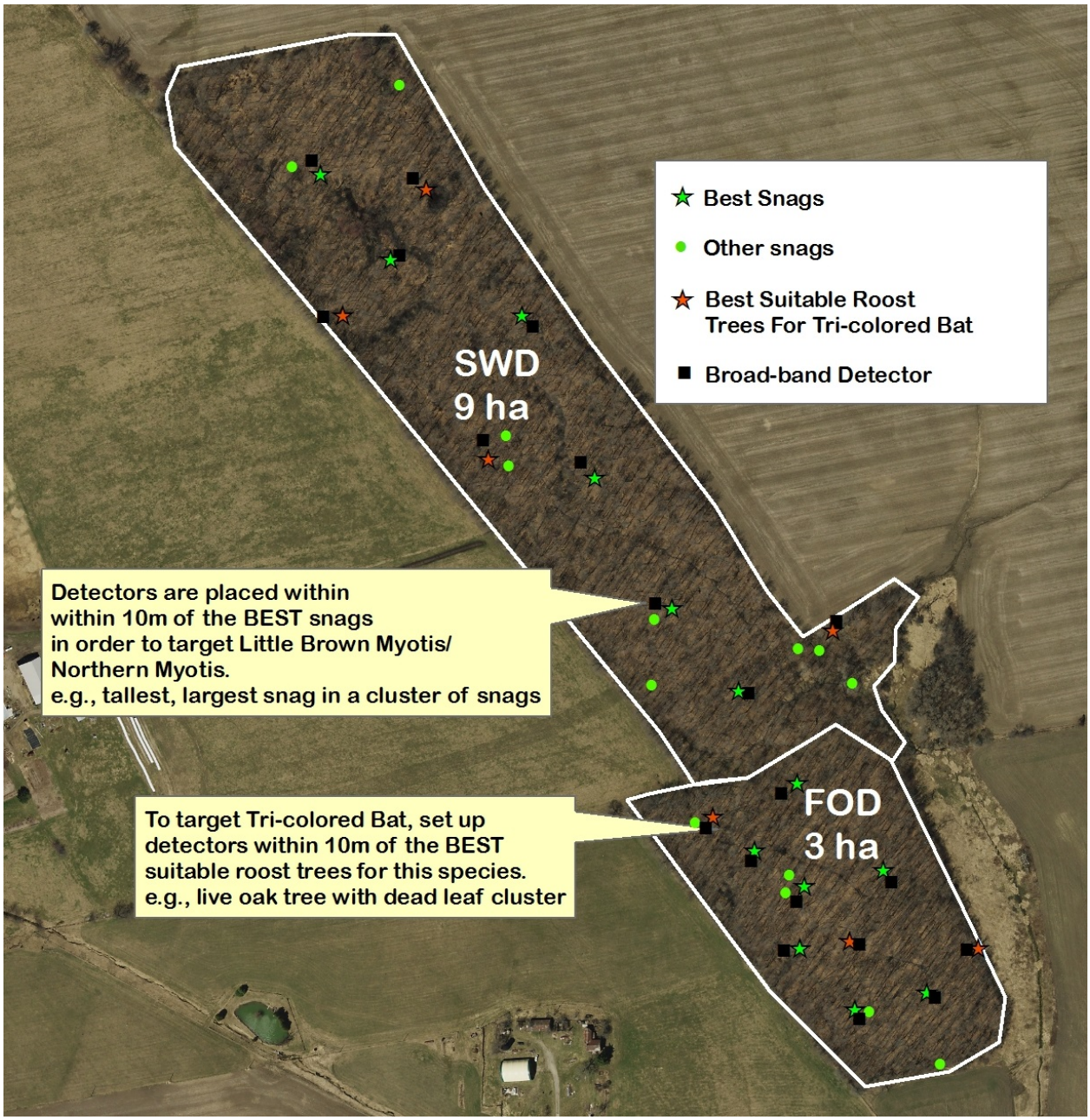


Figure 2: Hypothetical example illustrating the location and density of acoustic detectors i.e., 4/ha to a maximum of 10 per ELC ecosite.

Timing and Weather Conditions:

Acoustic surveys should take place on **evenings between June 1st and June 30th, commencing after dusk and continuing for 5 hours**.

Surveys should occur on warm/mild nights (i.e., ambient temperature >10°C) with low wind and no precipitation. At least 10 visits on nights that align with the above conditions where no SAR bat activity is detected are required to confirm absence.

Note that project proponents may cease survey work at any point once documentation of all three SAR bats species presence occurs.

Recommended Equipment Guidelines for Best Results:

- Broadband detectors (full spectrum) should be used. These may be automated systems in conjunction with computer software analysis packages or manual devices with condenser microphones.
- Acoustic monitoring systems should allow the observer to determine the signal to noise ratio of the recorded signal (e.g., from oscillograms or time-amplitude displays). These provide information about signal strength and increase quality and accuracy of the data being analysed.
- Microphones should be positioned to maximize bat detection i.e., situated away from nearby obstacles to allow for maximum range of detection and angled slightly away from prevailing wind to minimize wind noise.
- The same brand and/or model acoustic recording system should be used throughout the survey (if multiple devices are required), as the type of system may influence detection range/efficiency. If different systems are used, this variation should be quantified.
- Information on the equipment used should be recorded, including information on all adjustable settings (e.g., gain level), the position of the microphones, and dates and times for each station where recording was conducted.

Analysis:

Analytical software should be used to interpret bat calls and process results. Data should be analysed to the species level (as opposed to the genus level) in order to confirm presence/absence of SAR bats. Note that MNRF may request a copy of the raw acoustic data file when reviewing the results of the work completed in Phase III.

Additional Notes:

Project proponents should be aware that information about the number of bat passes detected in an area does not allow for an estimate of the number of bats present because there is not a 1:1 relationship between the number of passes and the number of bats responsible for those passes. It is not possible to distinguish between several bat passes made by a single bat flying repeatedly through the study area vs. several bats each making a single pass. Therefore, bat passes cannot provide a direct estimate of population densities.

Next Steps:

If Little Brown Myotis and/or Northern Myotis are detected, project proponents should proceed to Phase IV (Snag Density Survey). If only Tri-colored Bat is detected, snag density is not relevant and the proponent can proceed directly to Phase V (Complete an Information Gathering Form).

Phase IV: Snag Density Survey

Snag density information may be useful when the MNRF is considering the potential impact of a proposed activity on Little Brown Myotis and/or Northern Myotis. Snag density for each suitable ELC ecosite should be noted on the field data sheet provided in Appendix B. Surveys should take place during the leaf-off period so that the view of tree cavities, cracks and loose bark etc., is not obscured by foliage.

Snag density is a qualitative assessment of a treed ecosite, not a method of determining presence/absence of maternity roost habitat. There is no minimum threshold in terms of the number of snags/ha for an ELC ecosite to be considered suitable maternity roost habitat. However, an ELC with 10 or more snags/ha may be considered to be high quality potential maternity roost habitat. This information may be relevant when considering overall benefit in cases where a s.17(2)c permit under the ESA is required.

For smaller ecosites (e.g., <10 ha), snag density (# of snags/ha) can be calculated by dividing the number of snags mapped in Phase II by the total area of the ecosite.

Example:

ELC ecosite	Size (ha)	# of snags	Snag Density
WOD-M4	3.1	14	4.5 snags/ha
FOD-M2	0.8	9	11.25 snags/ha

For larger ecosites (e.g., >10 ha), sample plots can be used to estimate snag density within the suitable ELC ecosite, as follows:

- Select random plots across the represented ELC ecosite
- Survey fixed area 12.6m radius plots (equates to 0.05 ha)
- Survey a minimum of 10 plots for sites up to 10 ha, and add another plot for each additional ha up to a maximum of 35 plots
- Measure the number of suitable snags in each plot
- Use the formula πr^2 to calculate the number of snags/ha (where r=12.6m)
- Map the location of each snag density plot and record the UTM location using a GPS
- Calculate snag density for the ELC ecosite (snags/ha)

Example: **ELC Ecosite FOD-M2 (12 ha)**

# of sample plots	Total # of snags in sample plots	# of sample plots x r	Area of plots (πr^2)	Snag Density
12	48	12 x 12.6m = 151.2m	$3.14(151.2m)^{2} =$ $71784.9m^2$ = 7.18 ha	48 snags in 7.18 ha = 6.7 snags/ha

Phase V: Complete an Information Gathering Form

If SAR bats are detected during Phase III, the proponent should complete an Information Gathering Form (IGF) and submit it to the MNRF, Guelph District Office (esa.guelph@ontario.ca) for review. The IGF is available by searching the form repository on the government of Ontario website: http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf.

The MNRF will determine whether an activity is likely to kill, harm or harass a listed species and/or damage or destroy its habitat. The MNRF requires all of the necessary details and results from this survey protocol to be included on the IGF in order to make this determination.

For more information on overall benefit permits, including submission guidelines, process and timelines, please visit: https://www.ontario.ca/page/species-risk-overall-benefit-permits.

Appendix A – Suitable Maternity Roost Trees for Tri-colored Bat

Include all oak trees ≥10cm dbh (if present). If oaks are absent, include maples ≥10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Survey Date(s):

Site Name: Observer(s):

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			
				☐ dead/dying leaf cluster ☐ cavity ☐ open area/forest gap ☐ forest edge ☐ interior ☐ preferred tree species within 10m?			

Appendix B – Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis

Include all live and dead standing trees ≥10cm dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Survey Date(s):

Site Name: Observers(s):

ELC Ecosite: Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class[2]	Snag attributes (check all that apply)	Easting	Northing	Notes
				☐ cavity[3] ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?[4]			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			
				☐ cavity ☐ loose bark ☐ crack ☐ knot hole ☐ other snag within 10m? ☐ Decay Class 1-3?			

[2] **Height Class**: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

[3] The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

[4] **Decay Class**: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Reference: **150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario – SAR Bat Maternity Roost Habitat Suitability Assessment**

ATTACHMENT C
Photographic Record

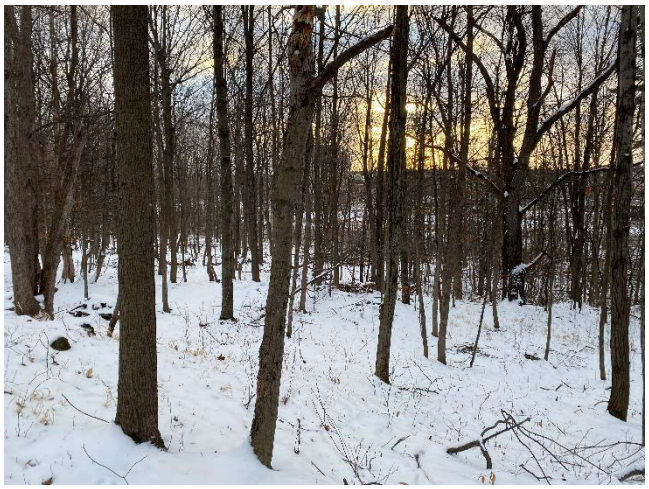


Photo 1: Existing conditions within FODM5-4 community at the northwestern edge of the Site, facing southeast.

Photo 2: Existing conditions within FODM5-4 community at the central area of the Site, facing northeast.

Photo 3: Existing conditions within THD community at the northeastern edge of the Site, facing southwest.

Photo 4: Existing conditions within FODM5-4 community at the central-eastern area of the Site, facing south.

Photo 5: Existing conditions within FODM5-4 community at the central-western area of the Site, facing east.

Photo 6: Feces (within red circle) observed outside of a frost split cavity on a butternut tree (T08) suggesting small mammals (e.g., SAR bats) are using this cavity.

Stantec

Client/Project	Date
EMD-Batimo – SAR Bat Maternity Roost Habitat Suitability Assessment at 150 Kanata Avenue & 1200 Canadian Shield Avenue, Kanata, Ontario	21/12/2021
	Project No. 160925112
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PHOTOGRAPHIC RECORD	Page 1 of 2

Photo 7: A suitable SAR bat maternal roosting tree (T03).

Photo 8: Cavity at T03 that could provide suitable maternal roost habitat for SAR bats.

Photo 9: Suitable SAR bat maternal roosting trees (Middle-back; T05 and T06).

Photo 10: A butternut (middle-back) that has cavities suitable for SAR bat maternal roosting (T13).