The potential environmental impacts to bats and bat habitats associated with the development of the East Durham Wind Energy Centre have been provided in detail in the following sections.

5.2 Potential Impacts to Significant Bat Habitat

NRSI biologists have completed comprehensive site investigations and evaluations of significance of potential bat habitats within the East Durham Wind Energy Centre. These studies have determined that several treated as significant bat maternity colony habitats are present within 120m of, and in some cases overlapping, the project location. In accordance with the REA Regulation, each of these features within 120m of a wind turbine or overlapped by a project component has been specifically addressed below, as these habitats may be impacted by the operation of the project as per Appendix D of the Natural Heritage Assessment Guide (OMNR 2011b). Other significant, or treated as significant, bat habitats present within 120m of, but not overlapping, project components that will not have an operational impact on the habitat have been collectively addressed as part of the generalized mitigation measures in Section 5.3.4.

5.2.1 Habitat Loss

Installation of wind turbines, access roads, and cabling may require tree removal, and could result in the permanent loss of suitable tree habitat for bat maternity colonies. If a suitable cavity tree containing a significant bat maternity colony will be removed for the installation of a project component, this will result in the loss of the preferred habitat for that colony. If such a tree is removed during the roosting period, there may also be direct mortality of bats, particularly if there are juveniles within a cavity that are unable to fly.

Removal of trees may also result in the loss of suitable alternative cavity trees which may not be directly used by maternal roosting bats, but which may aid in the selection of the woodland by bats as a preferred roosting site.

Removal of a treed area may also result in a reduction in the number of cavity trees per hectare, which may result in the woodland no longer being identified as a candidate significant habitat for bat maternity colonies. Conversely, removal of a treed area may

result in an increase in the number of cavity trees per hectare, depending on the spatial distribution of cavity trees within the woodland. This potential impact depends on a number of factors including the fact that it is highly dependent on the spatial configuration of trees within the woodland and it is unknown whether the change in the number of cavity trees per hectare as a result of tree removal would influence the use of the habitat by bats. This change in the number of cavity trees per hectare is minor in comparison to the loss of individual cavity trees or even a significant bat maternity colony designation. As a result it is not discussed in further detail within this report.

It is not anticipated that significant bat maternity colonies will be impacted by direct habitat loss in woodlands other than the above-mentioned. Current layouts indicate that the remainder of proposed development is located outside of the boundaries of other significant, or treated as significant, bat habitats. Accidental vegetation removal when working in close proximity to features is still possible, however, and as a result is addressed in mitigation measures outlined below.

5.2.2 Noise Disturbance

Bat activity is generally limited to the period of twilight through sunrise. As with most wildlife, the noise associated with the construction activity has the potential to disturb regular bat activity. This disturbance, if any, will be a temporary disturbance limited to the construction and decommissioning phases of this project and is not expected to permanently impact local bat populations.

5.2.3 Operational Bat Mortality

The placement of wind turbines within 120m of significant bat maternity colonies has the potential to result in direct bat mortality due to the operation of large-scale wind turbines. Overall, bat mortality levels have been shown to be extremely variable throughout projects in North America, with an MNR summary of available literature indicating ranges of 0.07 - 47.5 bats/turbine/year (OMNR 2006). Post-construction mortality monitoring will be conducted during the operation phase of this project, and has been addressed in Table 13.

5.3 Approach to Impact Study

An environmental impact study is required for this project, following guidelines set out by the REA Regulation with regards to bats and bat habitats associated with wind turbines, based on the proposed layout and treated as significant bat habitat. This study discusses potential impacts to significant bat habitats, in each of the construction, operation, and decommissioning phases of this project. In addition, NRSI has also considered generalized mitigation measures that should be applied in areas where non-operational impacts may affect bat habitats. These generalized mitigation measures are meant to limit the temporary disturbance that may occur during the construction or decommissioning phases of this project.

Given the potential impacts at various distances to project location, NRSI has grouped bat habitats into 3 broad distance categories: overlapping, 0-30m, and 30-120m from the project location. These distance categories have been chosen as they each have the potential for different types of impacts on bat habitats. Although there is expected to be a gradual increase in potential impacts as development occurs closer to wildlife habitats, a distance of 30m has been chosen as a suitable division between specific types of impacts, with areas where the project location is within 30m of a significant bat habitat having an increased potential for impacts relating to visual and noise disturbance and other localized impacts to bats. The impacts within each of these distance categories are expected to be relatively consistent, however with slightly different impacts (and related mitigation measures) associated with each distance category.

The significant bat habitats are discussed in more detail below, including potential impacts and proposed mitigation measures. Additional consideration has been given to mitigation measures and monitoring programs for this project in the Environmental Effects Monitoring Plan, which has been prepared under separate cover by LGL (LGL 2012b). This report summarizes the potential environmental effects of the project on bat habitats and details the monitoring program that will be implemented for bat habitats during the various phases of the East Durham Wind Energy Centre.

5.3.1 Project Location Within Confirmed Significant Bat Habitat

No confirmed significant bat habitats have been identified within the East Durham Wind Energy Centre project area.

5.3.2 Project Location Within 120m of Confirmed Significant Bat Habitat

No confirmed significant bat habitats have been identified within the East Durham Wind Energy Centre project area.

5.3.3 Project Location In, or Within 120m, of Treated as Significant Bat Habitat

As a result of restricted site access, 2 potential bat habitats could not be evaluated for significance during the appropriate monitoring season prior to the submission of this report. Another potential bat habitat was identified after the timing window for completing surveys. For the purposes of this report, NRSI has treated these habitats as significant with the commitment to conduct pre-construction monitoring, if site access is granted, within these habitats to confirm whether these features are significant. If site access is not granted, these woodlands will be treated as significant. Pre-construction monitoring will be conducted in accordance with the July 2011 *Bat and Bat Habitats* provincial guidelines, and results will be compared to the appropriate provincial standards previously discussed in this report. Any of these habitats determined to be significant will be subject to the potential impacts, mitigation measures, and follow-up monitoring programs outlined in Table 13 below. If any of these habitats are identified as not being significant when compared with provincial standards of significance, no specific mitigation measures will be applied.

Table 13. Potential Impacts, Mitigation Measures, and Survey Methods for Bat Habitats that have been Treated as Significant

Feature ID	Distance to Project Component with an Operational Effect	Distance to Project Location (Nearest Component)	Potential Negative Effects	Pre-construction Surveys	Mitigation Measures (if significant)	Performance Objectives, Monitoring, and Contingency Plans
BMA-005 Bat Maternity Colony	Overlapping (T10)	Overlapping (T10)	• Accidental damage to, or permanent removal of vegetation, including tree limbs	Surveys will be conducted in accordance with Bats and Bat Habitats (OMNR 2011a). If surveys confirm the woodland is a candidate significant bat maternity colony habitat, the following EOS surveys will be conducted: A single 1.5hr visual point count survey will be conducted at 10 snags/cavity trees, as this woodland is <10ha. Surveys will be conducted during the month of June, on nights with suitable weather conditions. Site specific bat surveys are dependent on receiving site access for each of these features. If site access	• Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant bat roosting trees. • Prepare a tree preservation plan which identifies specific trees to be removed and whether each tree contains a cavity suitable for potential use as a bat maternity colony. • Cavity tree removal will occur outside of the maternity and summer swarming period of May 15 to August 31, wherever possible. If this is not possible, MNR will be consulted regarding any additional mitigation measures that may be required. • For each suitable cavity tree to be removed, a bat house will be installed in the remainder of the woodland for each of the affected habitats. • No clearing or habitat restoration to occur May 1st-July 31st to avoid disturbing natural bat processes	**Performance Objective:** • Protection of bat roosting habitat **Monitoring:** • Include T10 among turbines selected for post-construction mortality monitoring, to be conducted as outlined in the EEMP (Genivar 2012) • Access cannot be gained for this habitat, therefore no pre-construction or post-construction behaviour/disturbance monitoring will occur within BMA-005.
			• Noise disturbance and/or avoidance		• Impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been	

Feature ID	Distance to Project Component with an Operational Effect	Distance to Project Location (Nearest Component)	Potential Negative Effects	Pre-construction Surveys	Mitigation Measures (if significant)	Performance Objectives, Monitoring, and Contingency Plans
			behaviour during construction	is not available, possible alternative methods will be discussed with the MNR.	determined necessary.	
			• Avoidance caused by lighting		• Propose a lighting scheme that will minimize potential risk to bat collisions while fulfilling Transport Canada requirements	
			• Direct mortalities through collisions with operational turbines		• Develop and implement a post-construction monitoring plan in accordance OMNR's Bats and Bat Habitats (2011c) guidance.	
BMA-006 Bat Maternity Colony	0-30m	Overlapping (Access Road, Cabling Below Ground)	• Accidental damage to, or permanent removal of vegetation, including tree limbs	Surveys will be in accordance with Bats and Bat Habitats (OMNR 2011a). If surveys confirm the woodland is a candidate significant bat maternity colony habitat, the following EOS surveys will be conducted: A single 1.5hr visual point count survey will be conducted at 10 snags/cavity trees, as this woodland is 10ha. Surveys will be conducted during the month of June, on nights with	• Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant bat roosting trees. • Prepare a tree preservation plan which identifies specific trees to be removed and whether each tree contains a cavity suitable for potential use as a bat maternity colony. • Cavity tree removal will occur outside of the maternity and summer swarming period of May 15 to August 31, wherever possible. If this is not possible, MNR will be consulted regarding any additional mitigation measures that may be required. • For each suitable cavity tree to be removed, a bat house will be installed in the remainder of the	**Performance Objective:** • Protection of bat roosting habitat **Monitoring:** • Include the closest turbine, T11, among turbines selected for post-construction mortality monitoring, to be conducted as outlined in the EEMP (Genivar 2012) • Access cannot be gained for this habitat, therefore, no pre-construction or post-construction behaviour/disturbance monitoring will occur within BMA-006.

Feature ID	Distance to Project Component with an Operational Effect	Distance to Project Location (Nearest Component)	Potential Negative Effects	Pre-construction Surveys	Mitigation Measures (if significant)	Performance Objectives, Monitoring, and Contingency Plans
				suitable weather conditions.	woodland for each of the affected habitats. • No clearing or habitat restoration to occur May 1st-July 31st to avoid disturbing natural bat processes	
			• Noise disturbance and/or avoidance behaviour during construction		• Impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been determined necessary.	
			• Avoidance caused by lighting		• Propose a lighting scheme that will minimize potential risk to bat collisions while fulfilling Transport Canada requirements	
			• Direct mortalities through collisions with operational turbines		• Develop and implement a post-construction monitoring plan in accordance OMNR's Bats and Bat Habitats (2011c) guidance.	
BMA-007 Bat Maternity Colony	30-120m	100m (T16)	• Noise disturbance and/or avoidance behaviour during construction	Pre-construction surveys will follow July 2011 *Bats and Bat Habitats* guidelines (OMNR 2011). If surveys confirm the woodland is a candidate significant bat maternity colony habitat, the following EOS surveys will be conducted:	• Impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been determined necessary.	**Performance Objective:** • Protection of bat roosting habitat **Monitoring:** • Conduct post-construction monitoring of this feature for 1 year after construction, following pre-construction methods, if this feature is deemed
			• Avoidance caused by lighting		• Propose a lighting scheme that will minimize potential risk to bat collisions while fulfilling Transport Canada requirements	
			• Direct		• Develop and implement a post-	

Feature ID	Distance to Project Component with an Operational Effect	Distance to Project Location (Nearest Component)	Potential Negative Effects	Pre-construction Surveys	Mitigation Measures (if significant)	Performance Objectives, Monitoring, and Contingency Plans
			mortalities through collisions with operational turbines	A single 1.5hr visual point count survey will be conducted at 10 snags/cavity trees, as this woodland is <10ha. Surveys will be conducted during the month of June, on nights with suitable weather conditions.	construction monitoring plan in accordance OMNR's Bats and Bat Habitats (2011c) guidance.	significant. • If this first year of post-construction monitoring indicates that this feature may no longer be significant, an additional 2 years of post-construction monitoring will occur following pre-construction methods. • If a significant habitat is still significant after the first year of post-construction monitoring, no further monitoring will occur as the habitat will be considered to be unaffected. **Contingency Measure:** • If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed.

5.3.4 Generalized Mitigation Measures

In addition to the specific significant bat maternity colonies identified above (where operational impacts may occur), there are 23 additional potential bat habitats that are located within 120m of project components that do not have the potential to result in operational impacts to these habitats, as per Appendix D of the Natural Heritage Assessment Guide (OMNR 2011b). Based on MNR woodland boundary layers, there are several locations where there is perceived overlap of cabling with generalized habitats that are found within the municipal road right-of-way. The edge of these generalized habitats may be affected by vegetation removal, but this is expected to be minimal, if overlap does occur. As a result, NRSI is recommending generalized mitigation measures that should be applied to development activities within 120m of these generalized candidate significant bat maternity colony habitats. These generalized mitigation measures have been provided in Table 14 below.

Table 14. Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat during the Construction and Decommissioning Phases of the East Durham Wind Energy Centre

Project Component	Potential Impact	Potential Negative Effects	Mitigation Measures
All Project Components	Noise/human activity	• Disturbance to foraging bats as a result of increased noise and activity during the construction period	• Limit construction activities within 30m of woodlands to daylight hours during the period of May 15th to August 31st, wherever possible. • Maintain the largest possible distance between construction activity and wooded habitats, respecting the limits of the constructible area.
	Accidental damage to vegetation	• Accidental damage or removal of vegetation adjacent to the project location.	• Clearly delineate construction boundaries where construction will occur within 10m of woodlands (measured from dripline) to avoid accidental damage to tree species, including limbs and root zones.

5.4 Summary of Commitments

The records review, site investigation, and evaluation of significance have all been used to guide the proposed development and assess the potential impacts that the East Durham Wind Energy Centre may have on bats and bat habitats.

There are no confirmed significant bat maternity colony habitats within the East Durham Wind Energy Centre project area. Proposed development activities indicate that most turbines are located further than 120m away from treated as significant bat habitats with the exception of 4 of the proposed turbines. A summary of the 3 treated as significant bat maternity colony habitats found within the project area, can be found below in Table 15.

Table 15. Summary of Treated as Significant Bat Maternity Colony Habitats and Proximity to Project Location for the East Durham Wind Energy Centre

Type of Natural Feature	Wildlife Habitat ID	Distance to Nearest Turbine (from blade tip)	Turbine No.
Bat Maternity Colony	BMA-005	Overlapping	T10
Bat Maternity Colony	BMA-006	7m	T11
Bat Maternity Colony	BMA-007	100m	T16, T17

The impacts to bat populations within the East Durham Wind Energy Centre project area will largely consist of potential collision/mortality impacts or the potential loss of significant or alternative bat maternity colony cavity trees. Based on the presence of potential significant bat habitats overlapping, and within 120m of, the East Durham Wind Energy Centre location, NRSI has recommended a series of pre-construction monitoring requirements, mitigation measures, and follow-up monitoring that should be applied during the development of this facility, and have been summarized in the following sections.

5.4.1 Pre-Construction Monitoring Commitments

In accordance with the Natural Heritage Assessment process, NRSI biologists have identified 3 wildlife habitats that have been treated as significant for the purposes of this report. One of these features has been treated as significant until additional pre-construction surveys can be completed to confirm (or deny) the significance based on

provincially accepted evaluation criteria. Two additional habitats were not accessible due to restricted site access and it is not expected that site access will be granted. The pre-construction surveys that will be conducted as part of the commitments made in this EIS are summarized in Table 16 below.

The survey methods described below have assumed that site access will be granted. In the event that specific site access is not available for any part of a specific feature, monitoring cannot be completed at the habitat. An alternative method of monitoring a maternity colony is not possible, and as a result neither pre-construction nor post-construction behaviour/disturbance monitoring can take place. In this case, the nearest turbine to the feature will be chosen among turbines to be selected for post-construction mortality monitoring, to be conducted as outlined in the EEMP (Genivar 2012).

Table 16. Summary of Pre-construction Monitoring Commitments for Bat Habitats at the East Durham Wind Energy Centre

Wildlife Habitat Type	Generalized Methods	Location/Feature(s)
Bat Maternity Colony	**Site investigation survey methods:** The woodland will be surveyed to determine if a candidate maternity roost may be present. Methods will follow *Bats and Bat Habitats* (OMNR 2011a), as did the site investigations for all other woodlands in the project area. The number of cavity trees (>25cm dbh) per hectare will be determined using 0.05ha plots (circular plots with a radius of 12.6m), which are randomly placed throughout each woodland being investigated. A minimum of 10 plots should be used for woodlands which are 10ha or less in size, with one additional plot for every additional hectare for larger woodlands (up to a maximum of 35 plots). Plots will be randomly selected and 12.6m in radius within the portions of woodlands for which access is granted. The number of snags (with or without cavities) or live trees containing cavities within these plots which are >25cm dbh are counted. Following clarification of the intention of the guidance documents during a field session with MNR in March of 2012, only live or dead trees containing cavities will be counted. **Evaluation of Significance Methodology (if required):** If the woodland is deemed a candidate maternity colony (contains ≥10 cavity trees/snags per hectare) then the following evaluation of significance methodology will be conducted. A series of single 1.5hr bat exit surveys will be	BMA-007

Wildlife Habitat Type	Generalized Methods	Location/Feature(s)
	conducted at potential roosts within each habitat. Bat exit surveys will occur at a minimum of 10 snags/cavity tress for areas <10ha with one additional snag/cavity trees for each hectare for areas <30ha and a maximum of 30 snags/cavity trees for areas >30ha. Surveys will be conducted from 30min before dusk and end 1hr after dusk, and will include a combination of both visual and acoustic documentation of bat activity. Surveys will be in accordance with Bats and Bat Habitats (OMNR 2011a). Specific surveys, following the methods described above may not be conducted if site access cannot be secured for specific habitats. If site access is not available, alternative methods (if applicable) will be discussed with the MNR.	

5.4.2 Construction Mitigation Measures

Various sections above identify several mitigation measures that are recommended to limit potential impacts to significant natural features or wildlife habitats for the development of the East Durham Wind Energy Centre. To assist in identifying all mitigation measures that are recommended for this development as it pertains to bat habitats, a summary table of construction related mitigation measures has been provided below in Table 17, including the mitigation objective and specific location where each mitigation measure should be applied. The purpose of the table below is to consolidate the construction mitigation measures that are applicable to the bat habitats that have been identified through the Natural Heritage Assessment process. These mitigation measures, along with other mitigation measures that may be required as a part of other Natural Heritage features, have all been included in the Natural Heritage Assessment report that has been prepared by LGL (LGL 2012).

Table 17. Summary of Construction Phase Mitigation Measures Recommended for the East Durham Wind Energy Centre

Mitigation Measure	Objective(s)	Location(s)
Maintain the largest possible distance between construction activity and wooded habitats, respecting the limits of the constructible area.	Limit disturbances to natural bat foraging patterns	Entire Project
Clearly delineate construction boundaries where construction will occur within 10m of woodlands to avoid accidental damage to tree species.	Minimize impacts to trees in which bats may be roosting	Entire Project
Limit construction activities within 30m of woodlands to daylight hours during the period of May 15^{thst}-August 31st, wherever possible.	Limit disturbances to natural bat foraging patterns	All Generalized and Treated as Significant Bat Habitats
Prepare a tree preservation plan which identifies specific trees to be removed and whether each tree contains a cavity suitable for potential use as a bat maternity colony.	Protection of suitable cavity trees for bat maternity colonies	BMA-005 BMA-006 BMA-007*
Tree removal will occur outside of the maternity and summer swarming period of May 15 to August 31, wherever possible. If this is not possible, MNR will be consulted regarding any additional mitigation measures that may be required.	Avoidance of direct bat mortality	BMA-005 BMA-006 BMA-007*
For each suitable cavity tree to be removed, a bat house will be installed in the remainder of the woodland for each of the affected habitats.	Relocation of any significant bat maternity colonies that may be removed (if applicable)	BMA-005 BMA-006 BMA-007*

** Only if this habitat is determined to be significant through pre-construction surveys described in Section 5.3.3.*

5.4.3 Post-Construction Monitoring Commitments

In accordance with appropriate provincial guidance and the results of pre-construction surveys, a series of post-construction surveys may be required at the East Durham Wind Energy Centre. Some of these surveys will only be required depending on the results of additional pre-construction surveys that have been committed to in Table 16 above. Others are already known to be required based on the results of pre-construction surveys or standard monitoring required for all wind energy developments. A summary of post-construction commitments can be found below in Table 18.

Table 18. Summary of Post-construction Monitoring Commitments at the East Durham Wind Energy Centre

Survey Type	Location(s)	Generalized Methods	Purpose
Mortality Monitoring	Entire Project	Post-construction mortality monitoring will be conducted following the *Bats and Bat Habitats* (OMNR 2011a) provincial guidelines for three (3) years after the project has become operational. A suitable sub-set (at least 1/3) of turbines will be searched approximately every 3 days (twice weekly) for bat mortalities from May 1st to October 31st. Searcher efficiency and carcass removal trials will be conducted in accordance with provincial guidelines. Turbines 10 and 11 to be included in the subset of turbines to be searched during post-construction mortality monitoring, in order to assess the impact of these turbines on treated as significant bat habitats (BMA-005 and BMA-006). Bat mortality monitoring methods will be addressed in detail in the Environmental Effects Monitoring Plan.	To assess the direct impact of this facility on bat populations. If mortality rates surpass provincially determined thresholds, mitigation measures will be discussed with the MNR.
Bat Maternity Colony Monitoring	BMA-007*	Post-construction bat monitoring will be repeated at this habitat, if deemed to be significant, for one (1) year following the same methods utilized during pre-construction surveys (July 2011 *Bats and Bat Habitats* guidelines). If the habitat is still confirmed to be significant after the first year of post-construction monitoring, no further monitoring will occur. If this first year of post-construction monitoring indicates that this feature may no longer be significant, an additional 2 years of post-construction monitoring will occur following pre-construction methods. These surveys are only required if this habitat is evaluated to be significant based on pre-construction surveys.	To assess the potential disturbance impact of operational turbines on nearby significant bat maternity roosts.

** Only if this habitat is determined to be significant through pre-construction surveys described in Section 5.3.3.*

6.0 Summary and Conclusions

A detailed assessment of the bat habitats and bat activity within the proposed East Durham Wind Energy Centre occurred through the use of a records review, comprehensive site investigation, and evaluation of significance by Natural Resource Solutions Inc. biologists.

The proposed East Durham Wind Energy Centre is a 23MW wind energy facility located in Grey County, Ontario, and consists of the proposed installation of up to 16 wind turbine generators (with only 14 turbines constructed) and associated infrastructure, primarily in agricultural habitat. In accordance with the Renewable Energy Approval (REA) Regulation, a records review, comprehensive site investigation, evaluation of significance and environmental impact study were all completed at the East Durham Wind Energy Centre. This information has been compiled into this *Bat Monitoring Report and Environmental Impact Study*.

The results of the preliminary site investigation identified 10 potential bat habitats within 120m of project components deemed to have a possible operational impact (i.e. wind turbine), or shown as overlapping other project components (i.e. transmission line, access road or cabling). In order to confirm significance, bat habitat assessments occurred at 7 of these habitats in May and June of 2012. Monitoring at 2 habitats was not conducted because of restricted site access at the time of the 2012 monitoring period and the remaining habitat was identified through changes to the layout after other field work had already been completed. The results of the habitat assessments were used to determine that 1 habitat required a detailed evaluation of significance, and another 3 habitats were treated as significant until further field assessments can be completed, pending site access.

Based on the results of both the site investigation and evaluation of significance, NRSI has determined that 3 of the 10 habitats warrant consideration for bat maternity habitats, as they are treated as significant until pre-construction monitoring confirms otherwise. As a result of the significant determination, NRSI has outlined numerous mitigation measures and monitoring commitments that should be specifically applied to any

development activity within 120m of these significant habitats, as well as committed to pre-construction surveys.

NRSI has also identified the presence of other suitable bat habitats within 120m of, but not overlapping, project components that are not expected to have operational impacts on bat habitats (i.e. access roads, cabling, etc.). In accordance with the Natural Heritage Assessment Guide, Appendix D, generalized mitigation measures can be applied to these features to mitigate against potential disturbances during the construction and decommissioning phases of this project. NRSI has provided several mitigation measures that will be applied as necessary during the development of this project to ensure impacts to bats and bat habitats are limited.

Providing that the appropriate recommendations are followed, the anticipated impacts of this facility on significant bat habitat and local bat populations are expected to be minimal.

7.0 References

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Appendix I
Site Investigation Field Notes

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

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Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Project Name: East Durham Project #: 1217

Start Time 13:30 End Time 5:50 pm Date: May 31 - Jun 1, 2012 Observer(s): MND, MEJE

Polygon or Area ID (BMA 001) Weather Conditions: temp: 20° prec: None wind: 5km/h cloud cover: 75%

Day 2: temp 15° prec: rain wind: 10-15km cloud: 100%

Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17T)	Comments
Plot 1	Ø	0522403 4894591	2 Live Maples >25 cm, no cavities
Plot 2	1	0522392 4894616	2 cavities in Tree #1, 30 ft up
Plot 3	1	0522553 4894624	3 cavities in Tree #2 - Dead tree, 2 low, 1 25 ft
Plot 4	1	0522596 4894618	1 cavity in Tree #3 20 ft up
Plot 5	Ø	0522695 4894572	
Plot 6	1	0522772 4894558	1 cavity 8m up in Tree #4
Plot 7	1	0522890 4894678	1 cavity 5m up sugar Maple photo 1201-02
Plot 8	Ø	0522954 4894666	
Plot 9	Ø	0522895 4894574	
Plot 10	Ø	0522799 4894531	
Plot 11	2	0522736 4894493	3 cavities in Tree #5, 9-10m up, dead tree
Plot 12	Ø	0522510 4894416	
Plot 13	Ø	0522567 4894506	
Plot 14	Ø	0522610 4894555	
Plot 15	1	0522670 4894545	1 Maple tree with 3 small cavities in dead branch
Plot 16	Ø	0522734 4894370	
Plot 17	1	0522668 4894337	1 Maple tree with 3 cavities, near opening/trail
Plot 18	Ø	0522723 4894406	
Plot 19			
Plot 20			
Plot 21			
Plot 22			
Plot 23			
Plot 24			
Plot 25			
Plot 26			
Plot 27			
Plot 28			
Plot 29			
Plot 30			
Plot 31			
Plot 32			
Plot 33			
Plot 34			
Plot 35			

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM 17T	Photo Number(s)
1	Sugar Maple	2	34	0522392 4894616	100-1191
2	Sugar Maple	3	29	0522556 4894631	100-1192
3	Sugar Maple	1	36	0522596 4894618	100-1193
4	Sugar Maple	1	29	0522763 4894569	100-1194
5	Sugar Maple	3	38	0522736 4894493	100-1205
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

* High Quality

This Section Project Manager Use Only

Final Wodland Tally Formula: Total # Cavity Trees / (# Plots x 0.05ha)

= 9/(18x.05) = 10 ≥10/ha? (Yes) No If >10/ha: BMA- 001

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Forest Composition

Forest Description (e.g. ELC Ecosite):

Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)
Sugar Maple	D
American Beech	A
White Ash	O
Eastern Hemlock	R
Ironwood	R
Alternate Dogwood	O (low canopy understory)

Community Age

___ Young ___ Mid-Age ✓ Mature ___ Old-Growth

Description of general character of snags/cavity trees

- NW corner had the highest density of cavities
- cavity trees were mostly maple
- lots of logging of old growth trees throughout woodlot with some larger maple left along north side of pine plantation.

Woodland Photos

Photo Number	Photo Number

Supplementary Information, Incidentals

- Lots of dens / burrows (Groundhog?)
- very well drained soil with [illegible] of stone
- Wildlife incidentals: ruffed grouse, porcupine,
- transition to conifers occurs down the valley slope
- very tall maples + super canopy

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

Project Name: East Durham Project #: 1217

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Start Time 12:47 End Time 17:10 Date: June 28, 2012 Observer(s): MND, ELF

Polygon or Area ID (BMA-002 Weather Conditions: 28°, no wind, 20% cc, no precip., sunny

Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17)		Comments
Plot 1	1	0523983	4894762	Sugar maple, one cavity in dead branch. 5m height
Plot 2	0	0523939	4894759	
Plot 3	0	0523861	4894729	
Plot 4	0	0523799	4894743	
Plot 5	1	0523703	4894783	Sugar maple, one cavity, 10m up, 26cm dbh
Plot 6	1	0523530	4894694	Sugar maple, one large cavity, 3-4m up, 75 dbh
Plot 7	0	0523444	4894588	
Plot 8	0	0523364	4894707	
Plot 9	0	0523452	4894534	
Plot 10	0	0523450	4894485	
Plot 11	0	0523452	4894432	
Plot 12	0	0523460	4894383	
Plot 13	1	0523460	4894304	Ash sp., one cavity, 10-12m up, 35cm dbh
Plot 14	0	0523471	4894200	
Plot 15	0	0523420	4894181	
Plot 16	0	0523279	4894241	
Plot 17	0	0523130	4894261	
Plot 18	1	0523137	4894339	Sugar maple, small cavity, 10m up, 35cm dbh - not great
Plot 19	0	0523223	4894439	
Plot 20	0	0523287	4894480	
Plot 21	0	0523345	4894495	
Plot 22	0	0523392	4894506	
Plot 23	0	0523427	4894501	
Plot 24	0	0523490	4894509	
Plot 25	1	0523560	4894530	Sugar maple, small cavity, 4m up, 35cm dbh - not great
Plot 26	0	0523621	4894538	
Plot 27	1	0523682	4894536	Sugar maple, small cavity, 12m up, 35cm dbh
Plot 28	1	0523736	4894550	Sugar maple, small cavity, 0.5m up, 35cm dbh
Plot 29	0	0523789	4894546	
Plot 30	0	0523824	4894562	
Plot 31	0	0523860	4894567	
Plot 32	1	0523906	4894544	Sugar maple, small cavity, 3m up, 26cm dbh
Plot 33	0	0523949	4894554	
Plot 34	0	0523992	4894577	
Plot 35	0	0523989	4894643	

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM		Photo Number(s)
1	Beech snag	5	45	0523794	4894770	near edge of field
2	Sugar maple	1	75	0523530	4894694	open area, tractor path
3	Maple snag	multiple (>4)	100	0523484	4894289	near edge of field
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

This Section Project Manager Use Only

Final Wodland Tally = Formula: Total # Cavity Trees / (# Plots x 0.05ha)

9 / (35 x .05) = 5.1 > or = 10/ha? Yes / No

If >10/ha: BMA-

Forest Composition

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Forest Description (e.g. ELC Ecosite):

Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)
Sugar maple	D
Ash	A
Beech	O
Birch	O
Black cherry	R

Community Age

___ Young ✓ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Woodland Photos

Photo Number	Photo Number

Supplementary Information, Incidentals

Racoons
Cabbage white
red eyed vireo
wood thrush
wood peewee
roughed grouse
wood frog

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

Project Name: East Dunhamtown Project #: 12177

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number:

Start Time 10:07 End Time 13:15 Date: June 7, 2012 Observer(s): PNT, SMG

Polygon or Area ID (ELC 47) Weather Conditions: 18°C, sunny, wind=1, CC=20%, no precipitation

BMA-003 Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17T)	Comments
Plot 1	Ø	0524684 4894725	A - Fresh- mast sugar maple - black cherry (bottomland)
Plot 2	1	0524705 4894731	A
Plot 3	Ø	0524714 4894681	A
Plot 4	1	0524704 4894669	A
Plot 5	Ø	0524714 4894645	B - Fresh - moist sugar maple (rolling upland)
Plot 6	Ø	0524723 4894618	B-
Plot 7	Ø	0524763 4894611	B-
Plot 8	Ø	0524835 4894691	B-
Plot 9	Ø	0524847 4894727	B-
Plot 10	1	0525023 4894729	B -
Plot 11	Ø	0525103 4894721	C - Dry-fresh sugar maple - white elm (valley slope)
Plot 12	1	0525161 4894711	C
Plot 13	1	0525223 4894730	D - Mixed forest - valley slope (Dry-Fresh)
Plot 14	Ø	0525301 4894724	E - Sugar maple forest - (rolling upland)
Plot 15	Ø	0525427 4894598	E-
Plot 16	Ø	0525464 4894608	E -
Plot 17	Ø	0525486 4894680	E
Plot 18	2	0525484 4894714	E -
Plot 19	Ø	0525503 4894794	E -
Plot 20	Ø	0525542 4894804	E -
Plot 21	Ø	0525560 4894780	E
Plot 22	Ø	0525607 4894755	E
Plot 23			
Plot 24			
Plot 25			
Plot 26			
Plot 27			
Plot 28			
Plot 29			
Plot 30			
Plot 31			
Plot 32			
Plot 33			
Plot 34			
Plot 35			

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM (17T)	Photo Number(s)
1	sugar maple			525102 4894710	
2	American beech			525477 4894717	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Is Section Project Manager Use Only

Wodland Tally Formula: Total # Cavity Trees / (# Plots x 0.05ha)

= 7/(22x.05) = 6.4 >10/ha? Yes / (No) If >10/ha: BMA-

Forest Composition

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Forest Description (e.g. ELC Ecosite):	
Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)

Woodland Photos	
Photo Number	Photo Number

Community Age

___ Young ___ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Supplementary Information, Incidentals

- chipping sparrow
- American robin
- Giant swallowtail (field)
- Chestnut sided warbler
- Ovenbird
- pine warbler
- Eastern tent caterpillar
- gypsy moth
- Eastern wood pewee
- American crow
- ruffed grouse adult w/nest(7 eggs) DSC00885
- song sparrow
- common yellowthroat
- black capped chickadee
- wood thrush
- Blue Jay
- Field sparrow
- mourning cloak
- Chorus frog (seen)

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

Project Name: East Durham Project #: 1617

Start Time 14:40 End Time 16:00

Polygon or Area ID (ELC 22)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Date: June 7/17 Observer(s): PNT, SMG

Weather Conditions: 24°C, sunny, 0% cc, no precipitation, wind: 1

BM 004 Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17T)	Comments
Plot 1	Ø	0522601 4892471	
Plot 2	Ø	0522612 4892443	
Plot 3	Ø	0522653 4892407	
Plot 4	Ø	0522654 4892371	
Plot 5	1	0522716 4892338	
Plot 6	Ø	0522694 4892312	
Plot 7	Ø	0522679 4892233	
Plot 8	Ø	0522711 4892114	not able to fit >8 plots in woodland
Plot 9			
Plot 10			
Plot 11			
Plot 12			
Plot 13			
Plot 14			
Plot 15			
Plot 16			
Plot 17			
Plot 18			
Plot 19			
Plot 20			
Plot 21			
Plot 22			
Plot 23			
Plot 24			
Plot 25			
Plot 26			
Plot 27			
Plot 28			
Plot 29			
Plot 30			
Plot 31			
Plot 32			
Plot 33			
Plot 34			
Plot 35			

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM (17T)	Photo Number(s)
1	sugar maple			0522711 4892330	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

This Section Project Manager Use Only

Formula: Total # Cavity Trees / (# Plots x 0.05ha)

Final Wodland Tally = 1/(8 x .05) = 2.5 >10/ha? Yes / No

If >10/ha: BMA-

Forest Composition

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Forest Description (e.g. ELC Ecosite):

Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)

Woodland Photos

Photo Number	Photo Number

Community Age

___ Young ___ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Supplementary Information, Incidentals

- Turkey vulture
- Blue jay
- American crow
- Ovenbird
- Wood thrush
- Eastern towhee
- cottontail (droppings)
- black + white warbler

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Project Name: East Durham Project #: 1217

Start Time 15:41 End Time 16:15 Date: June 21, 2012 Observer(s): CM, CMO

Polygon or Area ID (BMA 098 Weather Conditions: 30°C, 100% c.c. wind 2 from S, heavy rain

Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17T	Comments
Plot 1	Ø	0525922 4894511	
Plot 2	Ø	0525961 4894496	
Plot 3		0525944 4894506	dead 12m snag
Plot 4	Ø	0525933 4894538	
Plot 5	Ø	0525906 4894562	
Plot 6	Ø	0525944 4894604	
Plot 7	Ø	0525911 4894642	
Plot 8	Ø	0525954 4894720	
Plot 9	Ø	0525940 4894768	
Plot 10		0525911 4894810	
Plot 11			
Plot 12			
Plot 13			
Plot 14			
Plot 15			
Plot 16			
Plot 17			
Plot 18			
Plot 19			
Plot 20			
Plot 21			
Plot 22			
Plot 23			
Plot 24			
Plot 25			
Plot 26			
Plot 27			
Plot 28			
Plot 29			
Plot 30			
Plot 31			
Plot 32			
Plot 33			
Plot 34			
Plot 35			

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM	Photo Number(s)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

This Section Project Manager Use Only

Final Wodland Tally

Formula: Total # Cavity Trees / (# Plots x 0.05ha)

= 2/(10 x .05) = 4

>10/ha? Yes / (No)

If >10/ha: BMA-

Forest Composition

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Forest Description (e.g. ELC Ecosite):	
Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)

Woodland Photos	
Photo Number	Photo Number

Community Age

___ Young ___ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Supplementary Information, Incidentals

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Project Name: East Dyborn WF Project #: 1217

Start Time 14:00 End Time 15:45 Date: June 8/12 Observer(s): PNT, SMG

Polygon or Area ID (EIC104) Weather Conditions: 24°C, wind=1, sunny, CC=5%, no precipitation

BMM 009 Plot Number	# live or dead cavity trees ≥ 25cm dbh	(45m acc). Plot Center UTM (Zone: 17T)	Comments
Plot 1	Ø	0527832 4893310	A - Freeman maples around the pond within woodland.
Plot 2	Ø	0527703 4893216	
Plot 3	Ø	0527638 4893243	
Plot 4	Ø	0527626 4893091	
Plot 5	Ø	0527611 4893344	
Plot 6	Ø	0527557 4893350	
Plot 7	Ø	0527501 4893363	
Plot 8	Ø	0527509 4893314	
Plot 9	1	0527521 4893286	
Plot 10	Ø	0527555 4893238	
Plot 11	Ø	0527487 4893209	B - Sugar maple - white ash forest
Plot 12	Ø	0527448 4893244	
Plot 13	Ø	0527365 4893292	
Plot 14	Ø	0527335 4893227	
Plot 15	Ø	0527349 4893181	
Plot 16	Ø	0527281 4893168	
Plot 17	Ø	0527258 4893232	
Plot 18			
Plot 19			
Plot 20			
Plot 21			
Plot 22			
Plot 23			
Plot 24			
Plot 25			
Plot 26			
Plot 27			
Plot 28			
Plot 29			
Plot 30			
Plot 31			
Plot 32			
Plot 33			
Plot 34			
Plot 35			

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM 17T	Photo Number(s)
1	Sugar maple	multiple		0527524 4893282	alright candidate
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

This Section Project Manager Use Only

Formula: Total # Cavity Trees / (# Plots x 0.05ha)

Final Wodland Tally = 1/(17 x .05) = 1.2 >10/ha? Yes (No) If >10/ha: BMA-

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Welland Biologists

Forest Composition

Forest Description (e.g. ELC Ecosite):

Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)

Community Age

___ Young ___ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Woodland Photos

Photo Number	Photo Number

Supplementary Information, Incidentals

- American robin
- Eastern wood pewee
- Song sparrow
- Leopard frog (>25)
- Green frog
- Deer tracks
- Wood frog
- American crow
- Turkey vulture
- * OA habitat (open water ponds) would be considered significant amphibian woodland breeding habitat.

Sketch candidate trees with multiple cavities, identifying the location of cavities

Candidate Bat Maternity Roost Data Form

Use this form in FOD, FOM, SWD, SWM

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project Manager Use Only:
Woodland Number :

Project Name: East Dufton Project #: 1217

Start Time 11:22 End Time 14:58 Date: June 21, 2012 Observer(s): CM, CMO

Polygon or Area ID (BMA 019 Weather Conditions: 29°C, hot & sunny, 5% cc, no precip. wind 3 from S

Plot Number	# live or dead cavity trees ≥ 25cm dbh	Plot Center UTM (Zone: 17T	Comments
Plot 1		0527860 4897574	one crack 1-2 cedar, could be a cavity up top
Plot 2	Ø	0527854 4897534	
Plot 3		0527879 4897525	one cavity ~ 6m up - woodpecker hole
Plot 4	Ø	0527838 4897462	
Plot 5	Ø	0527814 4897463	
Plot 6	Ø	0527768 4897492	
Plot 7	Ø	0527734 4897479	
Plot 8	Ø	0527693 4897505	
Plot 9		0527638 4897457	one cavity low in tree (3m)
Plot 10	Ø	0527645 4897461	
Plot 11	Ø	0527623 4897421	
Plot 12	Ø	0527569 4897386	
Plot 13	Ø	0527516 4897359	
Plot 14		0527486 4897415	
Plot 15	Ø	0527459 4897440	
Plot 16	Ø	0527461 4897506	
Plot 17	Ø	0527507 4897604	
Plot 18	Ø	0527494 4897673	
Plot 19		0527470 4897713	biggest DBH in forest so far
Plot 20	Ø	0527419 4897727	
Plot 21	Ø	0527425 4897696	
Plot 22		0527366 4897707	
Plot 23	Ø	0527302 4897727	
Plot 24	Ø	0527218 4897770	
Plot 25	Ø	0527195 4897702	
Plot 26	Ø	0527222 4897641	
Plot 27	Ø	0527276 4897647	
Plot 28	Ø	0527335 4897633	
Plot 29	Ø	0527379 4897599	
Plot 30	Ø	0527404 4897581	
Plot 31	Ø	0527436 4897527	
Plot 32		0527480 4897522	
Plot 33	Ø	0527414 4897484	
Plot 34	Ø	0527403 4897488	
Plot 35	Ø	0527380 4897440	

Number of Plots: Sites ≤10ha: 10 plots (minimum); each extra ha: 1 plot (up to max 35 plots) Plots = 0.05ha or 12.6m radius Select plots randomly

Preparation for EOS Bat Monitoring: Identification of High Quality Potential Roost Trees

Identify the best potential roost trees in the applicable woodland/polygon: <10ha in size = up to 10 >10ha in size = 1 additional for each ha up to 30

Tree #	Species	# of Cavities	DBH (cm)	UTM	Photo Number(s)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

This Section Project Manager Use Only

Final Wodland Tally

Formula: Total # Cavity Trees / (# Plots x 0.05ha)

= 8 / (35 x .05) = 4.6

>10/ha? Yes / (No)

If >10/ha: BMA-

Forest Composition

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Forest Description (e.g. ELC Ecosite):

Tree Species	Abundance D= dominant (>50%) A=abundant (35-50%) O = occasional (2-35%) R = rare (<2%)

Community Age

___ Young ___ Mid-Age ___ Mature ___ Old-Growth

Description of general character of snags/cavity trees

Woodland Photos

Photo Number	Photo Number

Supplementary Information, Incidentals

ovenbird, rose-breasted grosbeak, variegated fritillary, question mark, European skipper, Peck's skipper, baltimore oriole, eastern tiger swallowtail, northern pearly eye, wood frog

Sketch candidate trees with multiple cavities, identifying the location of cavities

Appendix II
Evaluation of Significance Field Notes

BAT MONITORING EXIT SURVEYS

Project #: 1217 Project Name: East Durham BMA-001 Size(ha): 18 Sunset (24hrs): 21:14 hrs

Date (eg. June 5/12): Jun 27/12 Observers: MND / JAW Crew 1, 2 Vehicle UTM: _____

Temp. (@ sunset): 22 °C Wind Speed: 0 Wind Direction (from): N/A Cloud Cover (%): 15 Precipitation: none (eg. light rain, none)

Wind Scale (Beaufort): 0-Calm, 1-Smoke Drifts, 2-Wind Felt on Face, 3-Leaves Moving, 4-Sm Branches Move, 5-Sm Trees Sway, 6-Lrg Branches Move, 7-Whole Trees in Motion, 8-Twigs Break off/Hard to Walk, 9-Light Structural Damage, 10-Trees Uprooted

			BAT EXIT SURVEYS (1.5hrs)					VISUAL CHECK (5min)		OFFICE ANALYSIS	
Tree ID	Cam. #	UTM Zone (17T)	Tree Species	DBH (approx.) (cm)	Cavity Height(s) (m)	Camera Start (24hrs)	Camera Stop (24hrs)	Start Time (24hrs)	Individuals Observed	Individuals Observed	Species Distribution (#) (eg. MYLU-8,EPFU-4,MYSE-1)
A	40	0522392 4894616	Sugar Maple	50	4	18:41	23:21	20:56	0		
B	53	0522576 4894658	Bass Wood	45	4,5	20:26	23:11	21:05	0		
C	12	0522596 4894618	Sugar Maple	36	6	20:16	23:03	21:12	0		
D	44	0522763 4894569	Sugar Maple	24	6	20:06	22:52	21:20	0		
E	49	0522736 4894493	Dead Sugar Maple	38	1,5	19:43	22:43	21:29	0		
F	31	0522724 4894487	Beech	38	15	19:56	22:36	21:37	0		
G	9	0522524 4894424	Sugar Maple	40	7	19:31	22:23	21:47	0		
H	11	0522484 4894491	Dead Sugar Maple	28	20	19:19	22:12	21:55	0		
I	47	0522484 4894491	Sugar Maple	30	22	19:16	22:13	21:55	0		
J											
K											
L											
M											
N											
O											
P											
Q											
R											
S											
T											
U											
V											
W											
X											
Y											
Z											
AA											
BB											
CC											
DD											

Additional Comments:

(eg. landowner discussions, weather, equipment issues, wildlife observations, etc.)

Peterson on tree B had a dead battery, now replaced

Tree B = B01
Tree F is at F2

BAT MONITORING EXIT SURVEYS

Project #: 1217 Project Name: EAST DURHAM BMA-001 Size(ha): 18 Sunset (24hrs): 21:14 hrs

Date (eg. June 5/12): JUNE 27/12 Observers: JJK / NZ Crew 2 / 2 Vehicle UTM: 17T 0522345 4994689

Temp. (@ sunset): 22 °C Wind Speed: 0 Wind Direction (from): N/A Cloud Cover (%): 15 Precipitation: NONE (eg. light rain, none)

Wind Scale (Beaufort): 0-Calm, 1-Smoke Drifts, 2-Wind Felt on Face, 3-Leaves Moving, 4-Sm Branches Move, 5-Sm Trees Sway, 6-Lrg Branches Move, 7-Whole Trees in Motion, 8-Twigs Break off/Hard to Walk, 9-Light Structural Damage, 10-Trees Uprooted

			BAT EXIT SURVEYS (1.5hrs)					VISUAL CHECK (5min)		OFFICE ANALYSIS	
Tree ID	Cam. #	UTM Zone (17T)	Tree Species	DBH (approx.) (cm)	Cavity Height(s) (m)	Camera Start (24hrs)	Camera Stop (24hrs)	Start Time (24hrs)	Individuals Observed	Individuals Observed	Species Distribution (#) (eg. MYLU-8,EPFU-4,MYSE-1)
A											
B											
C											
D											
E											
F											
G											
H											
I											
J	54	0522909 4994653	Sugar maple	30	6	20:28	22:14	21:44	Ø		
K	51	0522918 4994636	Sugar maple	25	7	20:26	22:18	21:34	Ø		
L	24	0522914 4994638	Sugar maple	30	8	20:27	22:16	21:39	Ø		
M	22	0522920 4994620	Sugar maple	30	10	20:24	22:27	21:28	Ø		
N	10	0522941 4994616	Sugar maple	35	9	20:23	22:27	21:23	Ø		
O	58	0522954 4994644	Sugar maple	30	9	20:21	22:29	21:17	Ø		
P	14	0522946 4994640	Sugar maple	25	4	20:19	22:37	21:11	Ø		
Q	59	0522915 4994716	Sugar maple	100	9	20:18	22:35	21:05	Ø		
R	29	0522576 4994679	Sugar maple	125	7	19:38	22:44	20:55	Ø		
S											
T											
U											
V											
W											
X											
Y											
Z											
AA											
BB											
CC											
DD											

Additional Comments:
(eg. landowner discussions, weather, equipment issues, wildlife observations, etc.)

- observed 2 flying bats at 21:24 overhead of #10, flew towards 24 and atte away from 10
- bat near 54 in tree to right possibly.