3.4 Nocturnal AnaBat Surveys

The objective of the nocturnal AnaBat surveys was to record the relative abundance of echo-locating bats flying through the sampling area during summer breeding season and the spring and fall migration seasons.

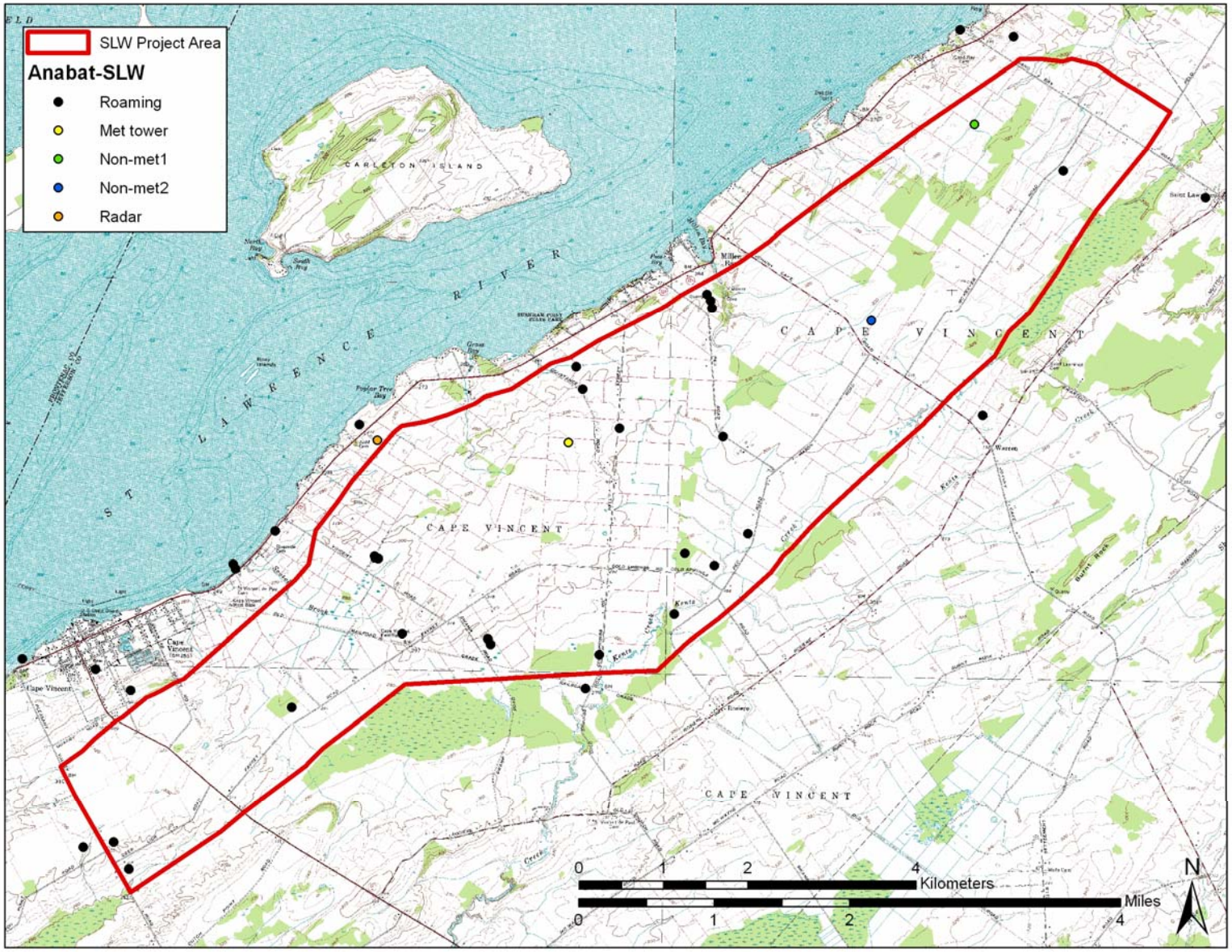
3.4.1 Methods

Bat activity at the project area was recorded using an AnaBat II ultrasonic bat detector attached to a zero-crossing analysis interface module (ZCAIM) which houses a compact flash memory card for temporary download of ultrasonic activity files. To sample continuously on remote mode (automatic data collection), the detector and ZCAIM were powered by an external 12V battery. Each AnaBat unit (detector, ZCAIM, and 12V battery) was enclosed inside a plastic box or dry bag with the detector microphone positioned against a PVC tube protruding from the box/bag. This design prevented water from damaging the AnaBat units without compromising the ability of the unit to detect ultrasonic noise in the environment. To limit variation among AnaBats, sensitivity settings were calibrated for each unit prior to data collection. Most AnaBat units were set at or near setting 7 on the sensitivity dial. Each passive AnaBat unit was positioned so that the microphone faced the same cardinal direction for each sampling period. Calls were recorded for passive sampling from approximately sunset to sunrise (1900 – 0700). AnaBat units were removed from the field approximately once per week to download files, recharge batteries, and troubleshoot technical problems. Data gathered from the passive AnaBat units at the met tower were used to calculate bat activity (designated as number of calls/night) present at the site during the sampling periods. Nights that experienced any number of technical difficulties were not included in the final analyses.

During the spring sampling season (April 13 – May 29), two AnaBat sampling locations were established. One unit was placed at ground level in the open grassy field at the base of the project met tower and another unit was deployed near a wooded edge (Non-met 1) to increase likelihood of detecting additional species (Figure 15). Access issues and technical difficulties with the AnaBat unit at the Non-met 1 location caused the unit to be relocated to a small farm pond near a wooded edge (Non-met 2) within the project boundary after a week of sampling. Acoustic sampling at these two locations (Met tower and Non-met 2) continued through spring and these locations were maintained through the summer sampling season (June 28 – August 8). During the fall season (August 13 – October 9), AnaBat sampling continued at ground level at the met tower. A second AnaBat unit was deployed from August 15 – October 16 in a tree approximately 10 m above ground near the radar survey station (Radar; Figure 15).

In addition to the stationary passive units, a “roaming” or mobile AnaBat unit was deployed during the summer to assess resident/breeding bat species present within the project area. Roaming sampling was conducted using a handheld AnaBat unit for 9 nights (3 sampling periods of 3 consecutive nights each) at habitats likely to have high numbers of resident bats. To select locations for active sampling, reconnaissance visits were made to the project area during the day time to select sampling locations based on the presence of travel corridors (trails and roads), linear landscape features (forest edges), and access to water; habitat features known to be important for bats. Active sampling was conducted from sunset until approximately 4-5 hours after sunset (2100 – 0100).

Figure 15. AnaBat survey locations for the project area.



Analysis of bat calls was conducted using Analook software (DOS version). Analook displays ultrasonic activity in a format similar to a sonogram used for analysis of bird vocalizations (e.g., frequency versus time). Species identification was aided by the Preliminary Key to the Qualitative Identification of Calls within the AnaBat System (Amelon 2005, unpublished data) where characteristics such as slope, frequency, minimum frequency, consistency of minimum frequency, and shape of pulse assist in the identification of bat vocalizations. Due to similarity of call characteristics, two species (big brown and silver-haired bat) were lumped into one species category. All *Myotis*-like calls were identified to genus only and submitted to NYSDEC-recommended biologist, Eric Britzke, for identification to species. To obtain species identifications, an ID filter (Britzke and Murray 2001) was loaded into Analook to determine calls sequences of sufficient quality and length for species identification to be attempted. Once separated, echolocation calls of sufficient quality and length were also identified using quantitative techniques (Britzke 2003). Quantitative analyses are conducted by a cross-validated classification model based on 10 extracted call parameters [duration (Dur), maximum frequency (Fmax), minimum frequency (Fmin), mean frequency (Fmean), duration to the knee (Tk), frequency of the knee (Fk), duration of the body (Tc), frequency of the body (Fc), initial slope (S1), and slope of the body (Sc)] collected from 1,846 sequences (35,979 calls) of 12 eastern U.S. bat species (Britzke 2003). Average accuracy rates for species identification using this statistical method ranges from 56.9% (*L. borealis*) to 98.5 % (*M. grisescens*), with accuracy rates for *Myotis sodalis* ranging from 81.4% to 88.6%.

3.4.2 Results

Passage Rates

The total number of calls and number of calls per night, recorded by each AnaBat unit varied by location and season (Table 4). The met tower AnaBat unit detected 769 bat calls total (19.72 calls/night) during the 39 days of spring sampling. Sampling at the two non-met locations during spring resulted in higher bat activity (29-33 calls/night) than at the met tower, despite changing in sampling location for the non-met unit. Summer sampling occurred at the met tower on 9 nights and recorded a total of 198 calls (22.0 calls/night). Approximately 2.5 times as many calls (55.56 calls/night) were recorded at the non-met 2 location during summer, likely indicating a nearby roosting colony of species and/or better habitat for foraging bats. During fall, the AnaBat unit positioned at ground level at the met tower recorded the lowest number of bat vocalizations per night (9.26 calls/night). Despite a similar number of sampling days, the AnaBat unit located at the radar sampling station recorded more bat calls/night (32.58). Approximately 93% of calls (n=1519) at the radar location were recorded between August 15 and August 21. Only 25% of the calls recorded at the met tower (n=117) were recorded during the same sampling period.

Table 4. Number of sampling days, total number of calls recorded, and calls/night recorded by each AnaBat unit for spring, summer, and fall sampling periods.

Season	Location	# of sampling days used in analysis	Total # of calls	# calls/night
Spring	Met tower low	39	769	**19.72**
	Non-met 1	11	320	**29.09**
	Non-met 2	24	782	**32.58**
Summer	Met tower low	9	198	**22.0**
	Non-met 2	9	500	**55.56**
Fall	Met tower low	50	463	**9.26**
	Radar	50	1629	**32.58**

Species Identification

Using qualitative analysis of search calls, 5 species groups of bats were positively identified at the met tower location (Table 5). As is typical with AnaBat sampling, the majority of vocalizations were unable to be identified due to the few number of pulses per call (<5 pulses/call sequence). Relative call frequency was calculated by dividing the number of calls recorded for each species by the total number of calls recorded at the met tower for each season. Of those calls that were able to be identified to species, *Lasiurus borealis* calls accounted for the majority of the vocalizations during all seasons at the met tower.

Summer sampling with the mobile AnaBat unit occurred on nine nights and recorded 464 bat calls (Table 6). The objective of the mobile sampling was to identify to the extent possible the species of bats using the St. Lawrence Windpower project area during the summer breeding season. As with the fixed station sampling, many calls could not be identified to species. One individual of an additional species, eastern pipistrelle (*Pipistrellus subflavus*), was recorded during the roaming surveys and not recorded during sampling at the passive monitoring stations. The highest number of recorded calls was of hoary bat (Table 6); however, 95% of those calls occurred on one night at one location and may have been from only one or a few individuals echolocating repeatedly near the AnaBat microphone.

Following the qualitative screening, 208 call files with characteristics resembling *Myotis* species were submitted to Eric Britzke for further analysis. Of those files, 76 calls (36.5%) did not contain sufficient enough information to be processed quantitatively. The remaining calls were analyzed quantitatively on a nightly basis by site (Britzke 2003). Calls meeting the quantitative criteria for the following species were identified: eastern red bat (22 calls), little brown bat (50 calls), northern myotis (44 calls), and Indiana bat (16 calls).