Bat Surveys

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The Calvert County Natural Resources Division is partnering with the Maryland Biodiversity Project to document to species diversity of bats found in Calvert County. Using hand held Echo Meters and cell phones, we will document the presence of bats throughout the county. Surveying will be conducted through Stationary Point Surveys.

BACKGROUND

This study was inspired by a study conducted by Ben Neece . He established stationary, continuous monitoring at several locations in Calvert County. In 2018, he surveyed two locations at Flag Ponds Nature Park and one location at Hallowing Point Park. In 2019, he focused his efforts on Flag Ponds Nature Park.

Species expected in Calvert County are listed, along with their species code used in Table 1. Some bat species have very similar echolocation calls, so not all species can consistently be identified with complete certainty. Those with similar calls are grouped as indicated in their species code.

- big brown bat *Eptesicus fuscus* EPFULANO
- silver-haired bat *Lasionycteris noctivigans*; EPFULANO
- eastern red bat *Lasiurus borealis* LABONYHU
- evening bat *Nycticeius humeralis*; LABONYHU
- hoary bat *Lasiurus cinereus*; LACI
- eastern small-footed bat (*Myotis leibii*; MYLE
- little brown bat *Myotis lucifugus* MYLUSO
- Indiana bat *Myotis sodalis*; MYLUSO
- northern long-eared bat *Myotis septentrionalis*; MYSE
- tri-colored bat *Perimyotis subflavus*; PESU
- Mexican free-tailed bat *Tadarida brasiliensis*; TABR

TABLE 1. Number of nights in which bats were detected at Flag Ponds Nature Park (Cell 960) and Hallowing Poing Park (Cell 16064) in 2018 and 2019. Myotis indicates any identified or unidentified *Myotis* species. A * indicates species affected by white nose syndrome (WNS), but does not indicate that we found individuals with signs of WNS. Please see the report *2018 and 2019 Maryland Bat Surveys* by Ben Neece for more details.

Cell	Site	EPFULANO	LABONYHU	LACI	MYLE*	MYLUSO*	MYSE*	Myotis*	PESU*	TABR
2019-960	1	3	3	0	0	0	0	1	3	0
2019-960	2	4	4	3	0	0	0	0	4	0
2018-960	1	3	4	2	0	0	0	0	4	0
2018-960	2	4	4	2	0	0	0	0	4	0
2018-16064	4	4	4	1	0	0	0	0	3	0

VOLUNTEER DUTIES

- Explore County-owned property to record bat calls. Surveys on private property will be limited to volunteers' homes.
- Properly label recording files with date and species, making sure GPS data are included in the files
- Upload recordings to an on line storage site (Google Drive or SharePoint)
- Map locations accurately on paper maps or through online mapping via iNaturalist.
- Identify the habitat characteristics of survey locations.

REQUIREMENTS & EXPECTATIONS

- Work independently or in teams
- Be out at night between 9 pm-midnight (or later)
- Ability to transfer recordings from phones or tablets to online storage locations

SKILLS NEEDED

- Ability to work independently
- EchoMeter Touch 2 or similar bat detector (limited number available for checkout)
- Access to a smart phone or tablet with EchoMeter app installed

Optional, but Preferred, Skills

- Access to a smart phone or tablet with iNaturalist app installed
- Ability to use Kaleidoscope software for bat identification

TRAININGS

- Orientation through a workshop, in-person, or via phone to understand the project.
- Orientation and training on mapping via paper and online.
- On-going opportunities to join scheduled bat surveys

EQUIPMENT, MATERIALS & SUPPLIES NEEDED

- Smart Phone or Tablet (Android or iPhone)
- Echo Meter Touch (a few are available to borrow from staff, or you can purchase your own from: https://www.wildlifeacoustics.com/products)
- Echo Meter App on your phone or tablet
- Weather thermometer or local weather app.
- Data sheet (to be developed in 2021)

PROCEDURES

1. Make sure your cell phone is fully charged. The meter plugs into your charging port while recording.
2. Recordings should be made when evening temperatures are above 60F.
3. Start about 30 minutes before sunset.
4. Use the "Live Mode" and begin recording.
5. Continue recording, allowing the app to make identifications, until it seems that no more bats are being detected, typically after about 15 minutes of no identification.
6. You can review the recordings and delete any that have no identifications or are noise only.

SAVING AND SHARING DATA

- More information will be developed in 2021.
- If possible, add screenshots of the calls to iNaturalist.

SUMMARY OF 2020 ACTIVITIES

This was the first year of the project with intentions to continue the study in future years. The project was stalled due to the coronavirus pandemic whereby new projects were put on hold. The lack of Echo Meters also limited participation. Some volunteers continued to monitor independently.

Prior to the pandemic shutdown, we met twice to plan this new endeavor. We developed a resource guide of the bats that have been, or are potentially, found in Calvert County. We also established an overlay of the USGS Quad map, similar to what was used in the Herp Atlas, to help document, track and map our sightings.

Calvert County Technology Services installed Kaleidoscope on Karyn's computer and she was able to gain a basic understanding of how to edit the recordings.

- Although it seems like you have to pay, after the free trial period is up, you can use the Viewer version for almost everything we need to do. https://www.wildlifeacoustics.com/products/kaleidoscope-pro
- Here is a useful video done to help understand how to upload your recordings using Kaleidoscope. https://www.youtube.com/watch?v=1AgxZh_mfOc

VOLUNTEER EFFORTS

Seven volunteers responded to this opportunity, with one volunteer (Karen Anderson) reporting 2.75 hours. We have 22 Fans of the program.

FUTURE PLANS

- In late winter set up a meeting to re-acquaint volunteers about this project.
- Gather the informal observations made throughout 2020.
- Develop data sheet and protocol for volunteers.
- Apply for small grants to fund the acquisition of more Echo Meters.
- Better integrate the iNaturalist observations, additional volunteers, and field explorations.
- Train volunteers on using Kaleidoscope to process recordings.

Lower Marlboro Quad NW	NE	North Beach Quad NW	NE
CW	CE	CW	CE
SW	SE	SW	SE

Benedict Quad NW	NE	Prince Frederick Quad NW	NE
CW	CE	CW	CE
SW	SE	SW	SE

Mechanicsville Quad NW	NE	Broomes Island Quad NW	NE	Cove Point Quad NW	
CW	CE	CW	CE	CW	CE
SW	SE	SW	SE	SW	SE
				Solomons Quad NW	NE

Maryland's Bats

Calvert County

Bat Survey 2020


Big Brown Bat – *Eptesicus fuscus*

Larger than other brown bats. Yellowish brown glossy fur. Tail tip extends past skin membrane. Ears are broad and rounded and facial skin dark. Emerges a half hour after sunset, commonly roosts in barns and houses. Becomes active with temperature change and may be flying about mid-winter on warm days. Found in a variety of habitats.


Evening Bat – *Nycticeius humeralis*

Velvety brown fur, rounded oval-shaped ears with broad tragus. Facial skin dark. Smaller than Big Brown Bat. Flies slowly and steadily over fields and open areas when hunting. May migrate out of northern range in winters, but poorly known.


Northern Myotis – *Myotis septentrionalis*

Very long, pointed tragus. Long ears, yellow to brown fur on back. Pink facial skin around eyes and base of ears. Hunts in upland forests and dear understory vegetation. Found mostly in wooded areas. Hibernates in caves through winter.


Little Brown Myotis – *Myotis lucifugus*

Tragus straight, narrow, but not sharply pointed. Dark brown to blackish skin on snout and ears. Fur glossy, usually yellow-brown above, belly buff-yellow to gray-white. Emerges at or after dusk. Typically found near wetlands. Hibernates in caves for 4-6 months in winter. Becomes active again in spring.

Eastern Small-footed Myotis – *Myotis leibii*

Rare* Smallest eastern Myotis. Tragus narrow and pointed, black wings and facial skin, fluffy fur yellowish above, cream on belly. Emerges at dusk to feed, begins hibernation later than other Myotis species.


Silver-haired Bat – *Lasionycteris noctivagans*

Black fur with frosted tips. Rounded ears, and heavily furred tail. Emerges just after sunset and flies slowly. May fly low to the ground or at the canopy. Roost alone or in small groups under bark or on cavities. Found in forests or near forest edge, often near waterways. Not typically found in MD in summer, migrates south.


Tricolored Bat - *Perimyotis subflavus*

Broad-based tragus. Pinkish facial skin and forearms. Fur light in color, reddish to buff. Very small bat. Inactive from November to April when hibernating in caves. Emerges at sunset and flight is erratic. Hunts over water or at forest edge, and can be found in woodlands and farmland.


Hoary Bat – *Lasiurus cinereus*

Brown fur with white grizzled tips, large broad ears, and yellow fur around face. Larger than Big Brown Bat. Heavily furred tail. Flies fast and direct, hunts over streams and ponds. Highly migratory during summer, and uncommon in the east. Found in woodlands.


Eastern Red Bat – *Lasiurus blossevillii*

Most common bat in Calvert. Bright to dull orange in color, depending on sex. Short, rounded ears. Emerges early in the night and follow circuit paths. Roosts among leaves in deciduous trees. Sometimes hibernates in trees or leaf litter. Resident in Maryland. Hunts in forests or forest edge.


Supporting Calvert County's nature parks and natural spaces

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Calvert Nature Society: www.calvertparks.org
Calvert County Natural Resources Division:
www.calvertcountymd.gov/NaturalResources

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2018 Maryland Stationary Point Acoustic Bat Monitoring

Report: Calvert County Parks

Ben Neece

During summer 2018, we conducted stationary point acoustic surveys of bats throughout Maryland. We selected survey areas (cells) and designed our survey methods based on the North American Bat Monitoring Program (NABat) guidelines. This allows our findings to be useful at the site level, and also to be contributed to national bat research and conservation efforts.

After completing the surveys, we processed the recorded files with SonoBat 4.2.2 bat classification software, and then manually vetted the results to improve confidence in species detections. Some bat species have very similar echolocation calls and environmental conditions can reduce the quality of recordings, so not all species can consistently be identified with complete certainty. We were very conservative during the vetting process, but physical confirmation of some species may be desired. Our results indicate the likely presence of the listed species or species group during summer.

Table 1. Number of nights each species or species group was detected at each survey point. Species are big brown bat or silver-haired bat (*Eptesicus fuscus* or *Lasionycteris noctivigans*; EPFULANO), eastern red bat or evening bat (*Lasiurus borealis* or *Nycticeius humeralis*; LABONYHU), hoary bat (*L. cinereus*; LACI), eastern small-footed bat (*Myotis leibii*; MYLE), little brown bat or Indiana bat (*M. lucifugus* or *M. sodalis*; MYLUSO), northern long-eared bat (*M. septentrionalis*; MYSE), and tri-colored bat (*Perimyotis subflavus*; PESU). Myotis indicates any identified or unidentified *Myotis* species. A * indicates white nose syndrome (WNS) affected species, but does not indicate individuals with WNS were found.

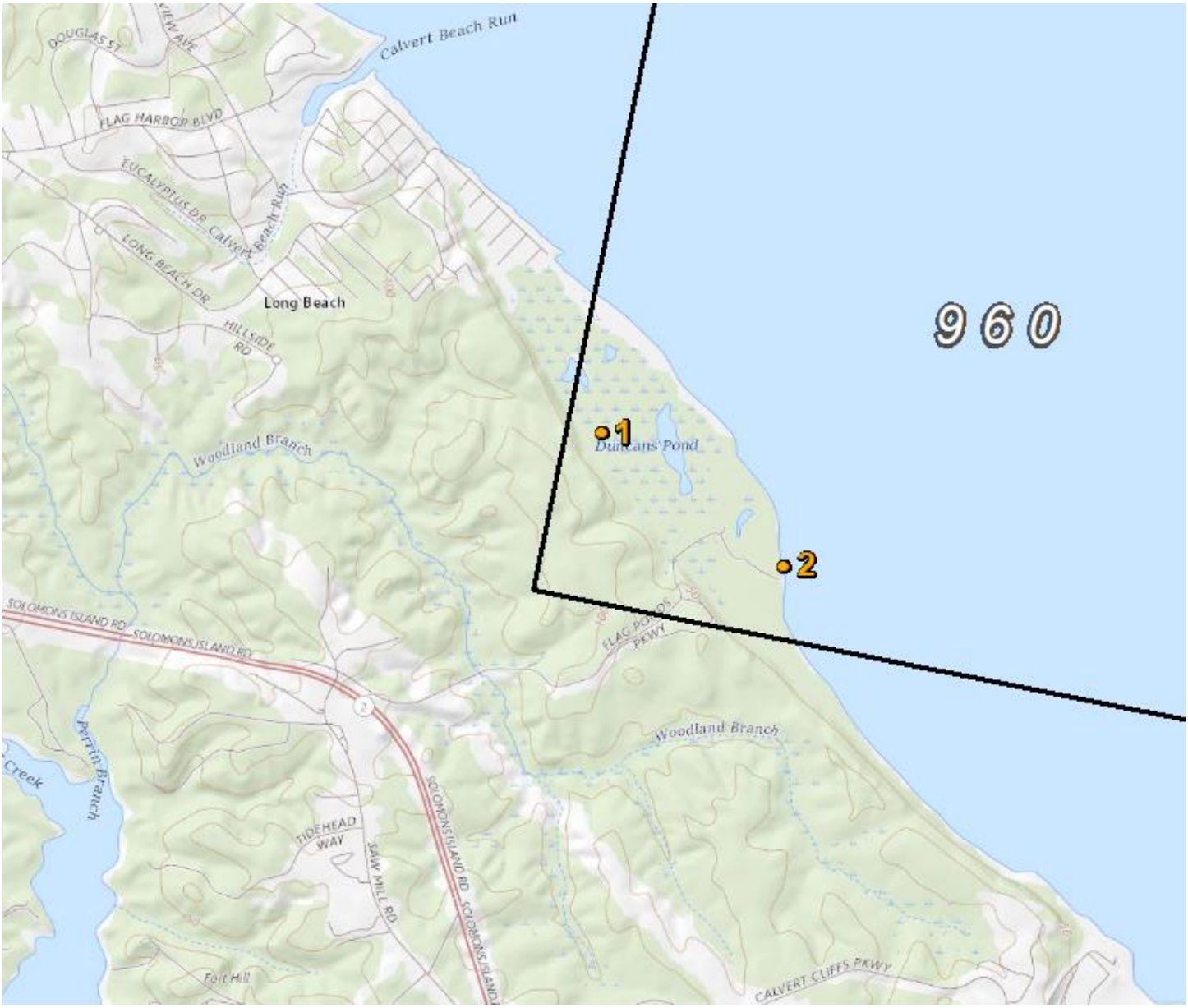
Cell	Site	EPFULANO	LABONYHU	LACI	MYLE*	MYLUSO*	MYSE*	Myotis*	PESU*
960	1	3	4	2	0	0	0	0	4
960	2	4	4	2	0	0	0	0	4
16064	4	4	4	1	0	0	0	0	3

Table 2. Coordinates for each survey site, start and end dates, and number of nights each site was surveyed.

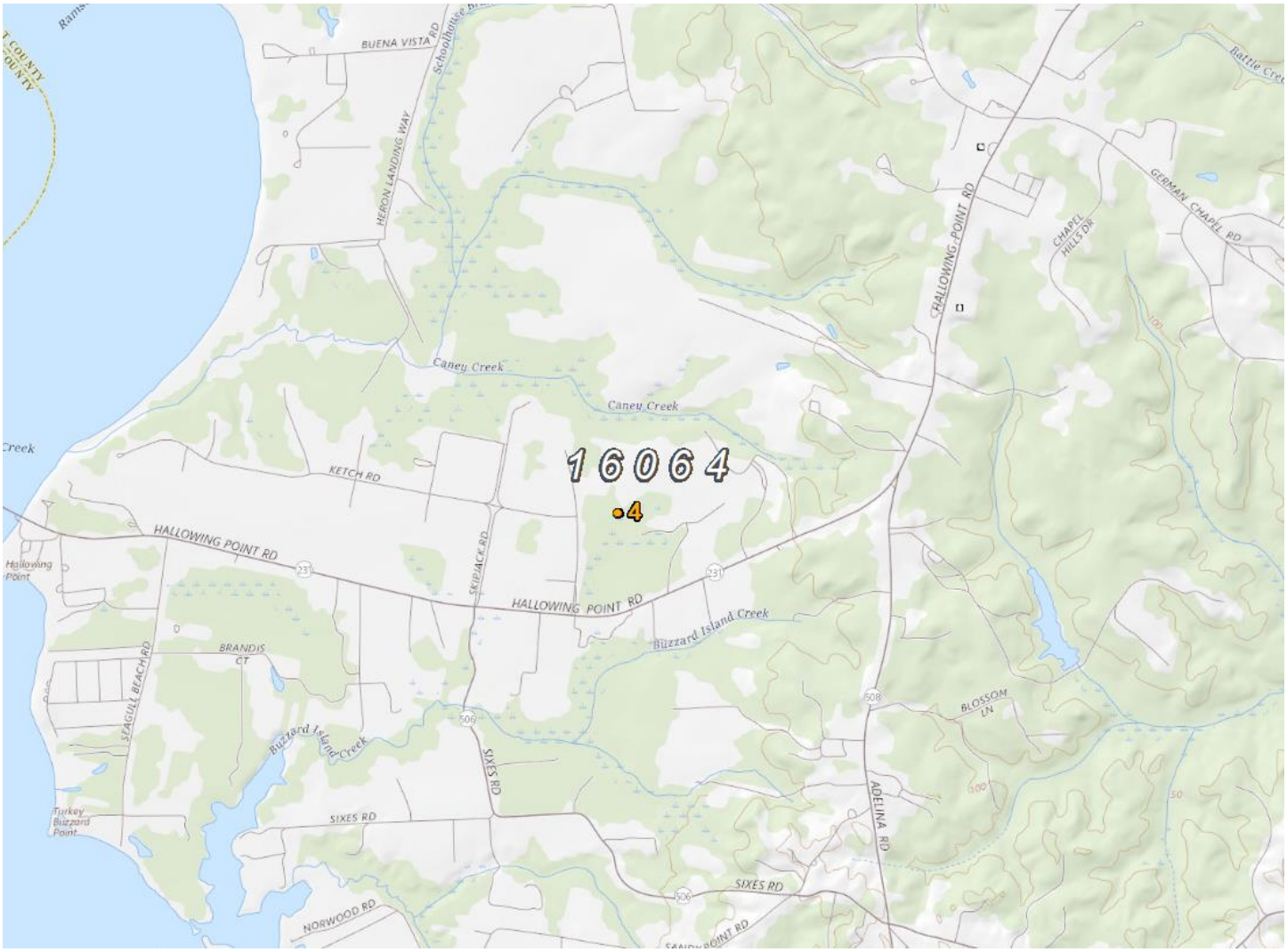
Park	Cell	Site	Lat.	Long.	Start	Stop	Nights
Flag Ponds	960	1	38.45277	-76.4622	2018-05-26	2018-05-30	4
Flag Ponds	960	2	38.4486	-76.45499	2018-05-26	2018-05-30	4
Hallowing Point	16064	4	38.51072	-76.63541	2018-05-26	2018-05-30	4

Maps depict NABat cells (black bordered squares) and survey sites (orange points). Cell numbers are shown within each cell, and site numbers are to the right of each point. All NABat cells came from a random selection from a grid and are 10 km x 10 km, but may not be visible on the maps displayed below due to the scale and positioning of points.

Flag Ponds Nature Park



Hallowing Point Park



2019 Maryland Bat Surveys

Report: Calvert County – Flag Ponds Nature Park

Ben Neece

During late spring and summer 2019, we conducted stationary point acoustic surveys of bats throughout Maryland. We selected survey areas (cells) and designed our survey methods based on the North American Bat Monitoring Program (NABat) guidelines (https://www.nabatmonitoring.org/). This allows our findings to be useful for conservation and management decisions at the site level, and also to be contributed to national bat research and conservation efforts. We surveyed many of the same sites in 2019 as we surveyed in 2018, but some new locations were added and some old locations dropped.

After completing the surveys, we processed the recorded files with SonoBat 4.4.1 bat classification software, and then manually vetted the results to improve confidence in species detections. Some bat species have very similar echolocation calls and environmental conditions can reduce the quality of recordings, so not all species can consistently be identified with complete certainty. We were very stringent during the vetting process, but physical confirmation of some species may be desired. Our acoustic results indicate the likely presence of species or species groups during summer. However, some species have quiet calls, fly very high, or echolocate very infrequently, so some species may be present but not detected.

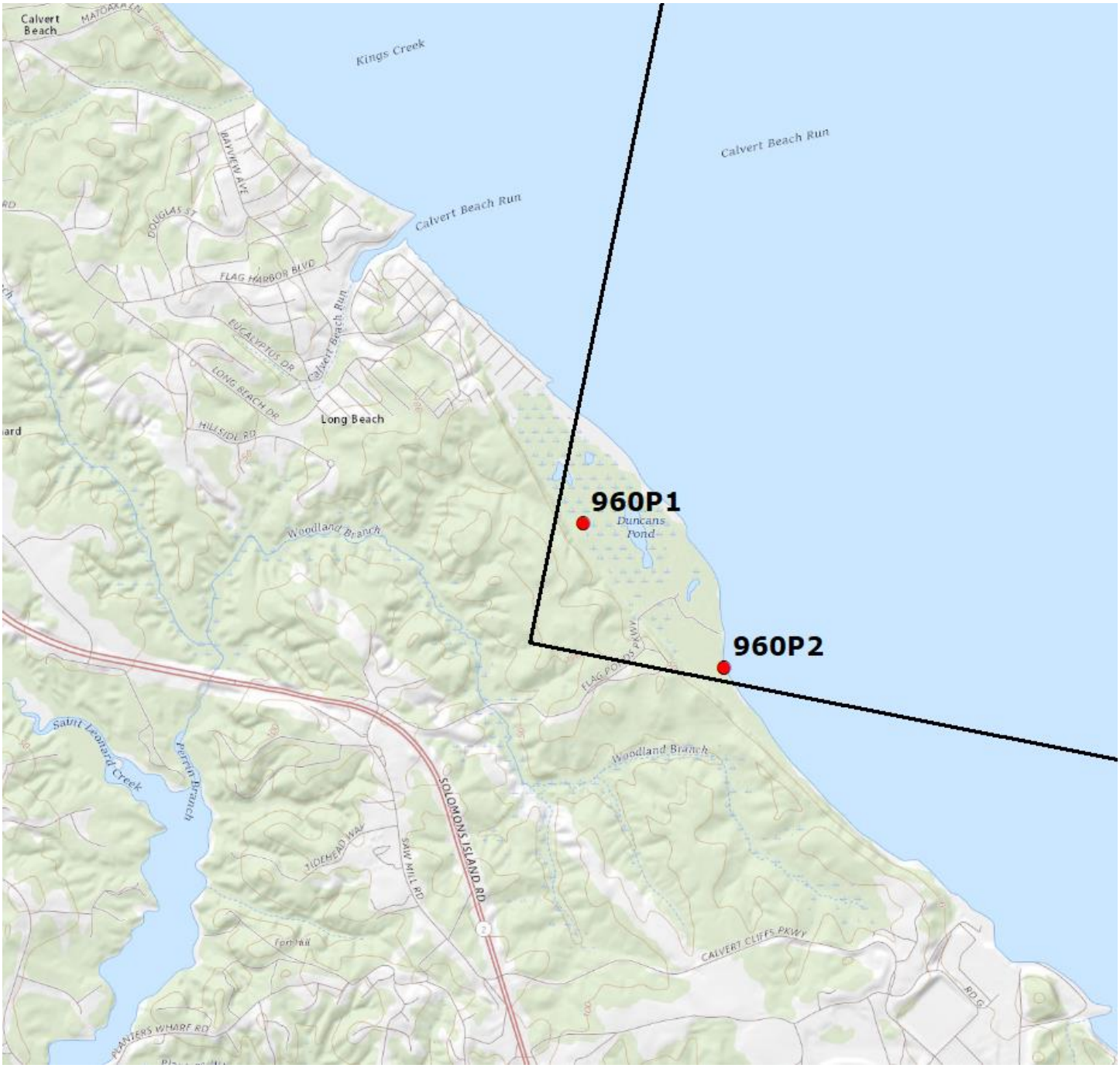
Table 1. Number of nights each species or species group was acoustically detected at each survey point. Species are big brown bat or silver-haired bat (*Eptesicus fuscus* or *Lasionycteris noctivigans*; EPFULANO), eastern red bat or evening bat (*Lasiurus borealis* or *Nycticeius humeralis*; LABONYHU), hoary bat (*L. cinereus*; LACI), eastern small-footed bat (*Myotis leibii*; MYLE), little brown bat or Indiana bat (*M. lucifugus* or *M. sodalis*; MYLUSO), northern long-eared bat (*M. septentrionalis*; MYSE), tri-colored bat (*Perimyotis subflavus*; PESU), and Mexican free-tailed bat (*Tadarida brasiliensis*; TABR). Myotis indicates any identified or unidentified *Myotis* species. A * indicates species affected by white nose syndrome (WNS), but does not indicate that we found individuals with signs of WNS.

Cell	Site	EPFULANO	LABONYHU	LACI	MYLE*	MYLUSO*	MYSE*	Myotis*	PESU*	TABR
960	1	3	3	0	0	0	0	1	3	0
960	2	4	4	3	0	0	0	0	4	0

Table 2. Coordinates for each survey site, start and end dates, and number of nights each site was surveyed.

Cell	Site	Lat	Long	Start	Stop	Nights
960	1	38.45264	-76.46211	2019-06-03	2019-06-07	4
960	2	38.4468	-76.45493	2019-06-03	2019-06-07	4

Map depicts NABat cell (black bordered square) and survey sites (red points). Labels are formatted as [*Cell Number*]P[*Site Number*].



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