Seasonal Occupancy and Activity Patterns of Appalachian Spruce-Fir Forests by Tree Bats

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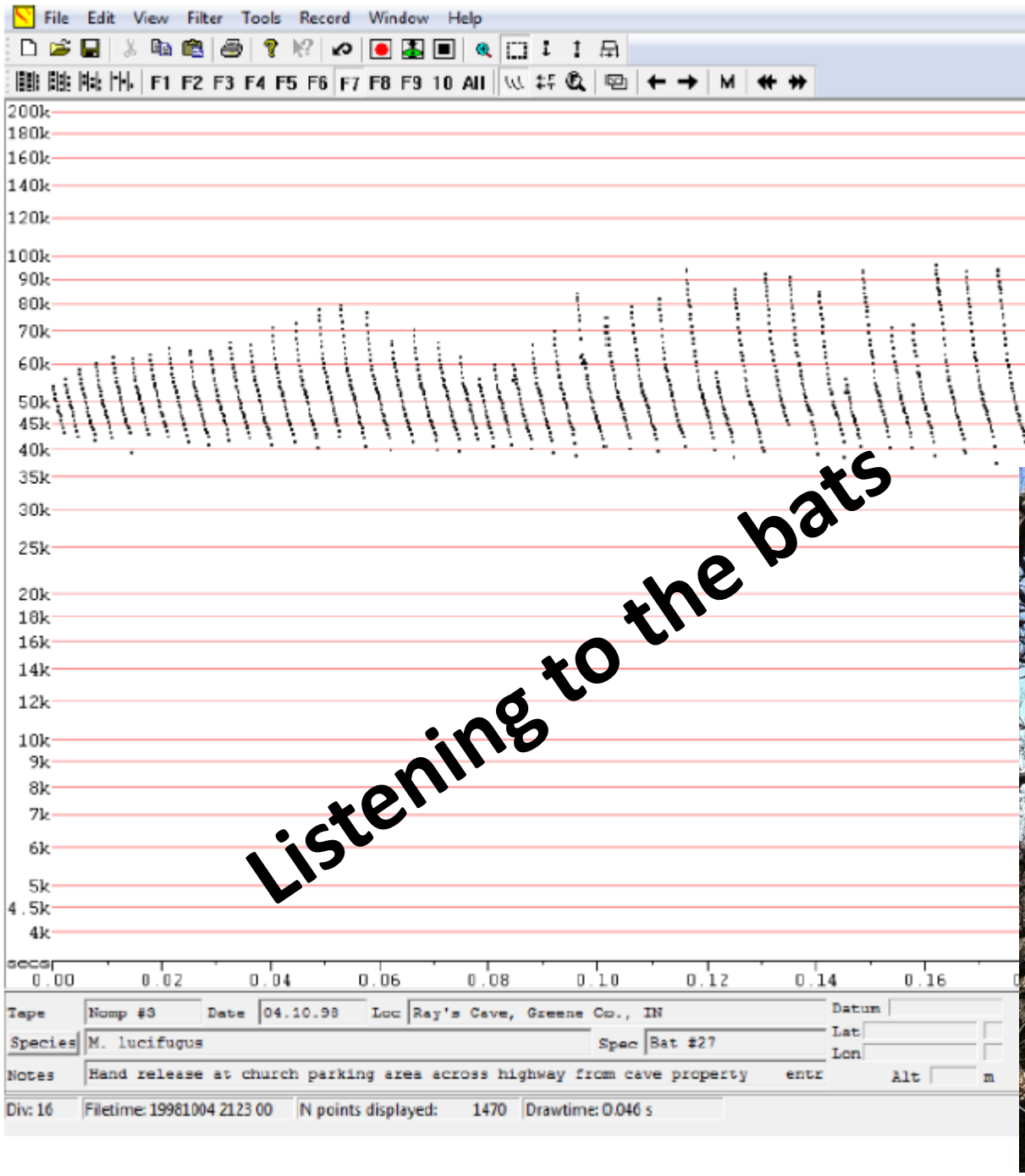
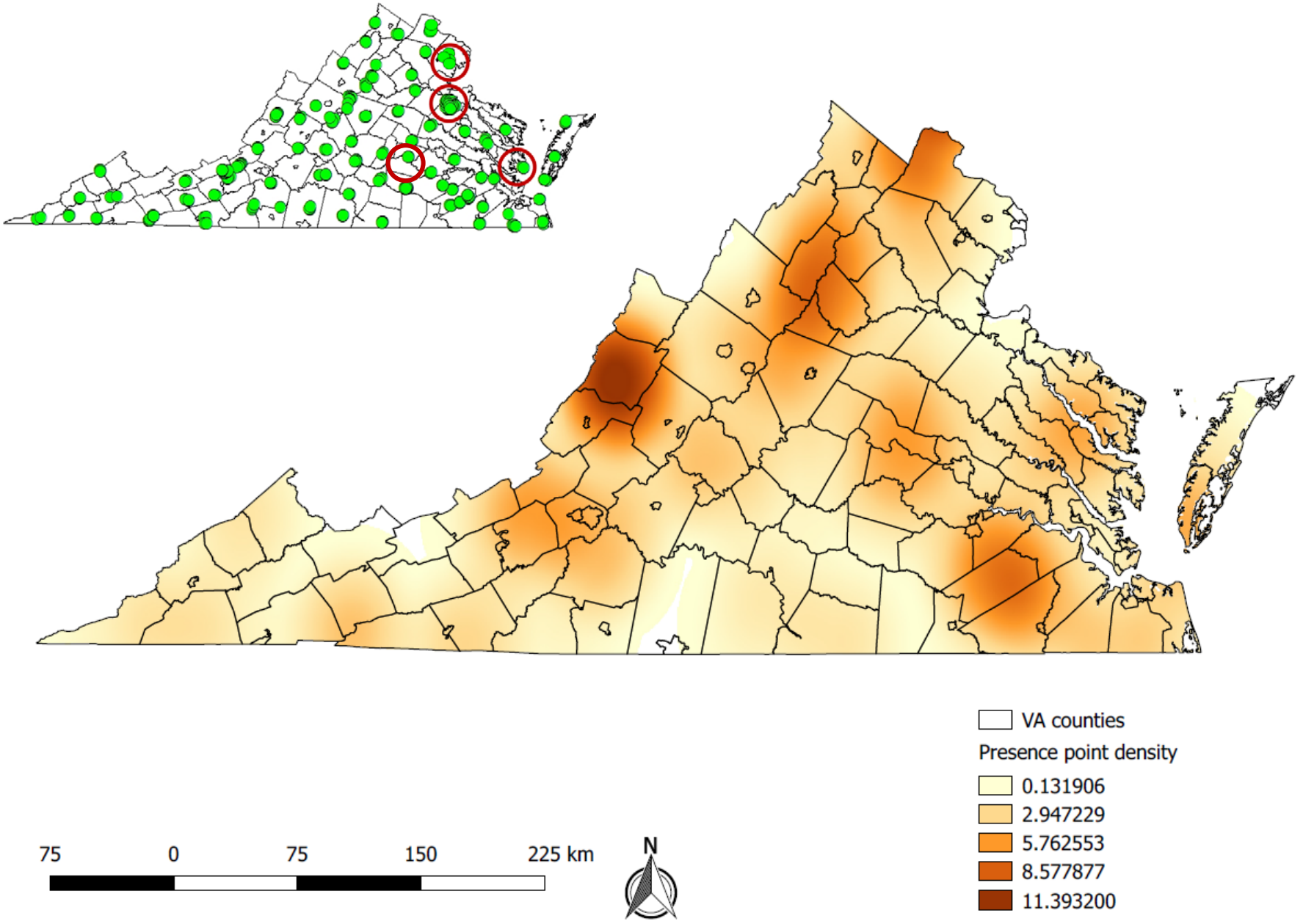
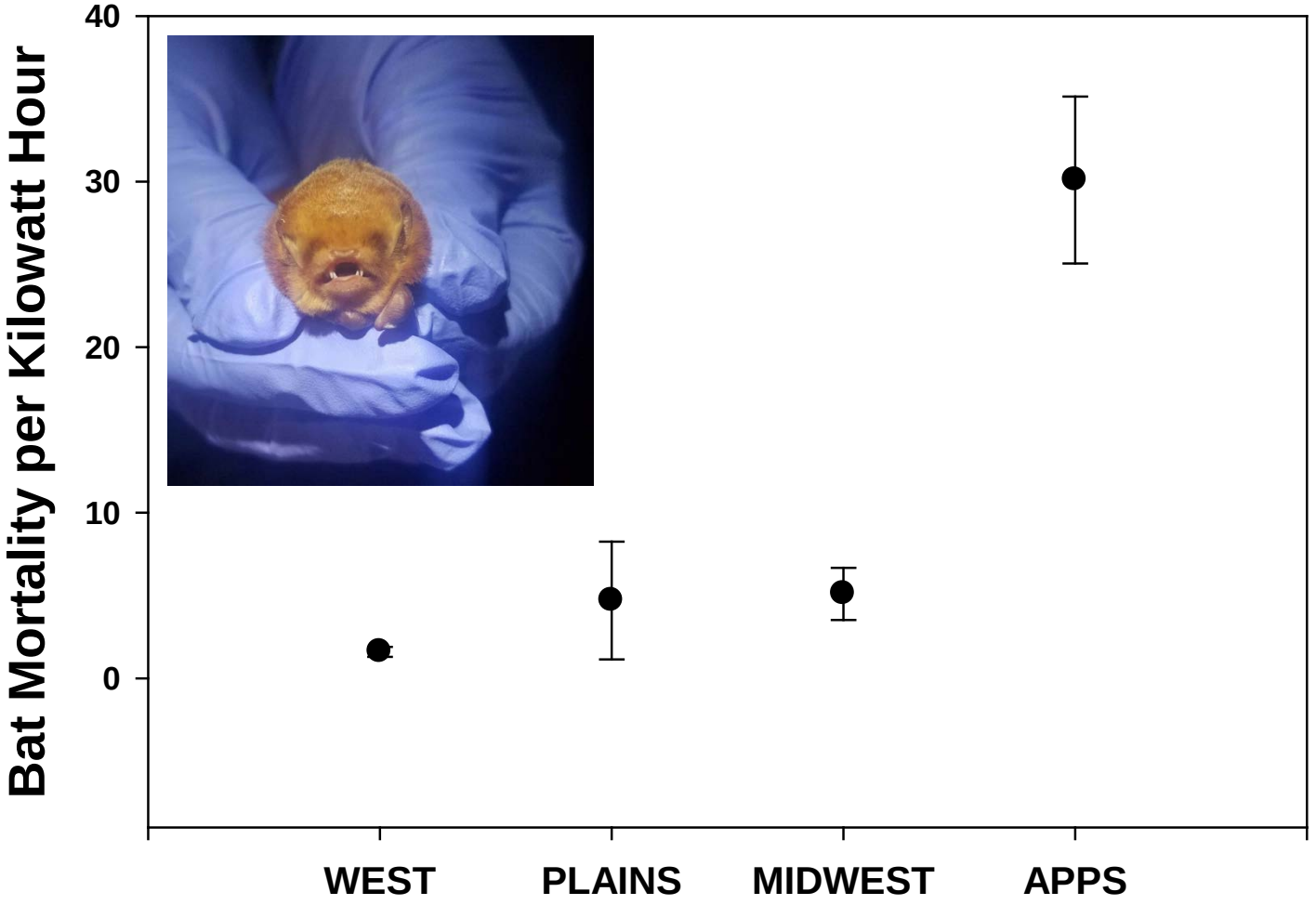
Listening to the bats



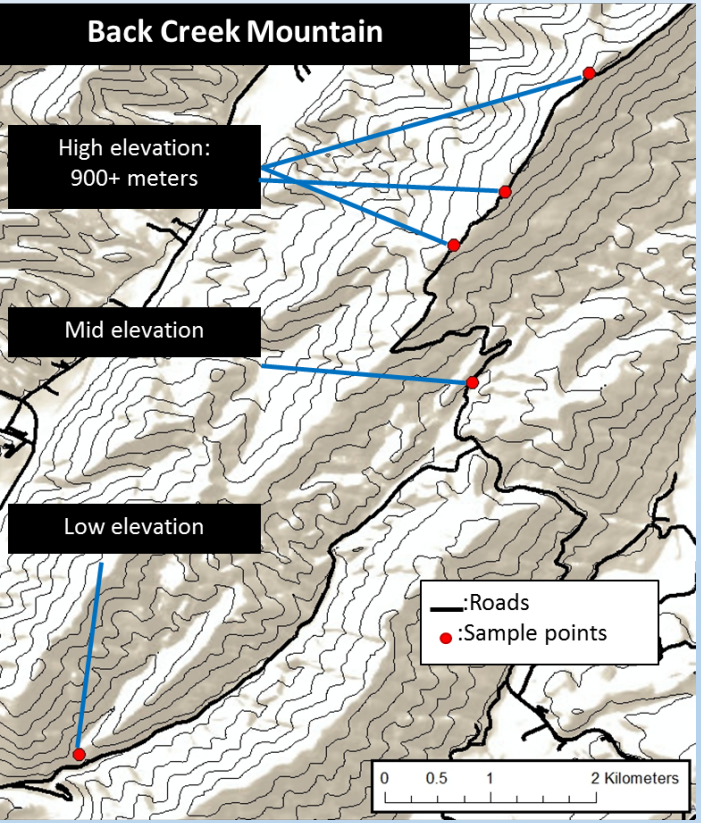

VA counties
Presence point density
0.131906
2.947229
5.762553
8.577877
11.393200
75
0
75
150
225 km
N

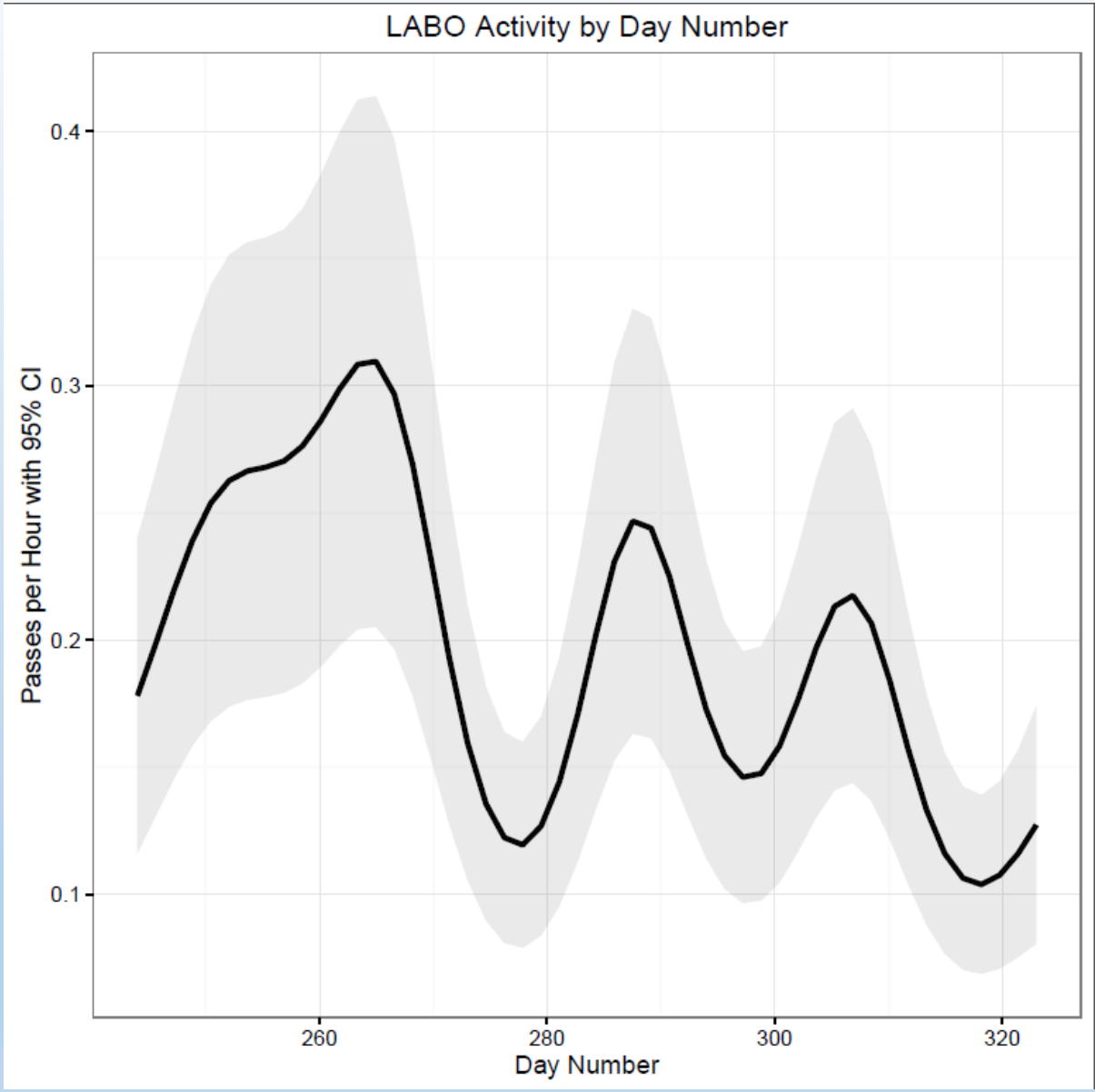
Differential Mortality by Region



Gruver and Bishop-Boros. 2015. EDP Renewanables North America Report.

Eastern Red Bat





Francl, K. E., W. M. Ford, and S.B. Castleberry. 2004. Bat activity in central Appalachian wetlands. Georgia Journal of Science 62:87-94.

METHODS

- 10 areas, each with a cluster of 3 PetterssonD500x detectors
- Spring (early May), Summer (July-early August), Fall (late September-October) survey periods in 2015 in spruce, spruce-fir or fir
- 1-11 detector “nights” per detector per season
- Bat identification in Kaleidoscope 4.2 on neutral (0) setting
- Single-season multiple survey occupancy and detection probability in Program PRESENCE
- Relative activity by season blocked with site cluster and elevation and canopy height as random variables modeled in SAS using PROC GLIMMIX

Tennessee

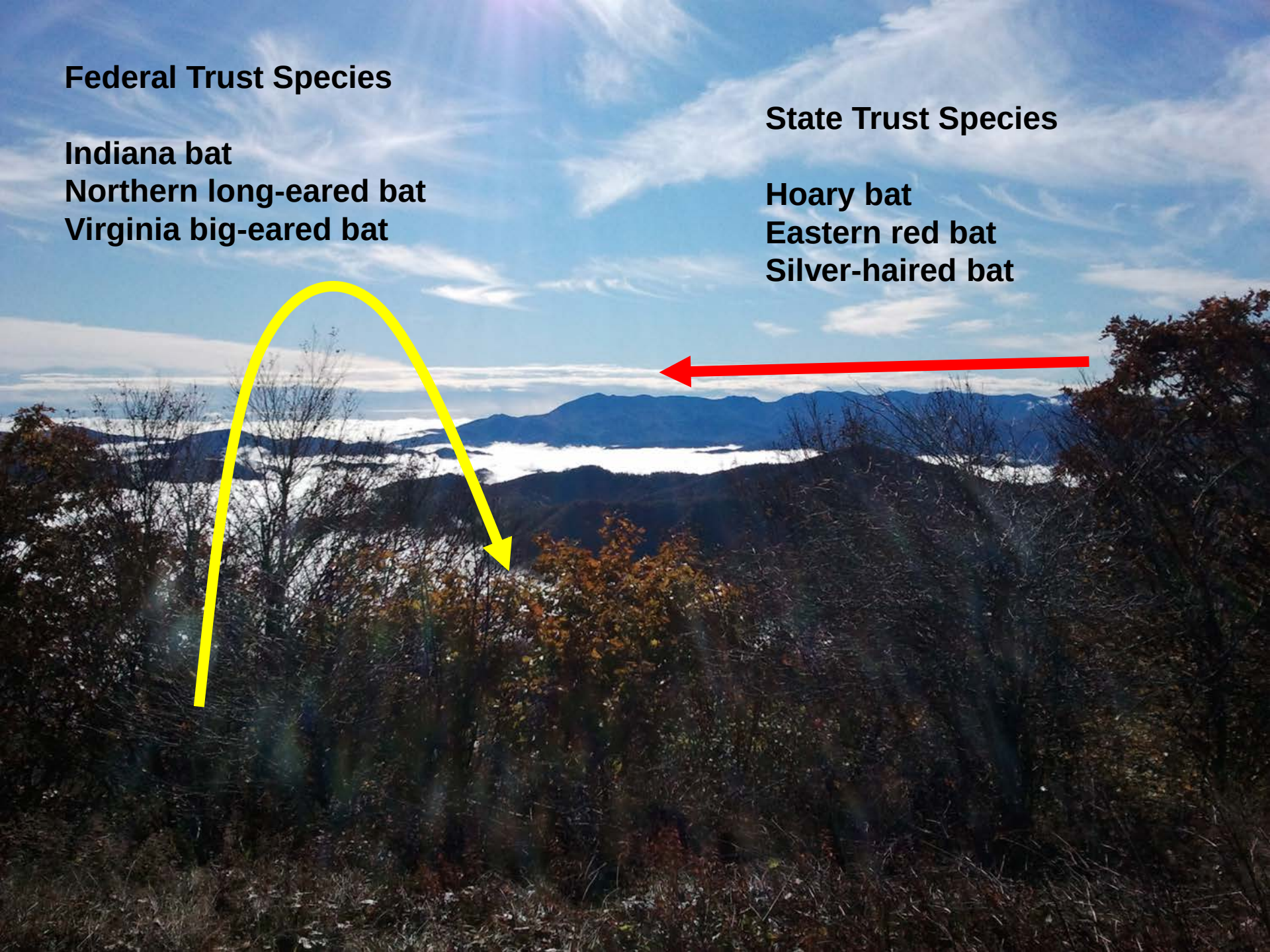
North Carolina


Eastern Red Bat (*Lasiurus borealis*)
VT CNRE/Alex Morrison


Hoary Bat (*Lasiurus cinereus*)
VT CNRE/Alex Morrison

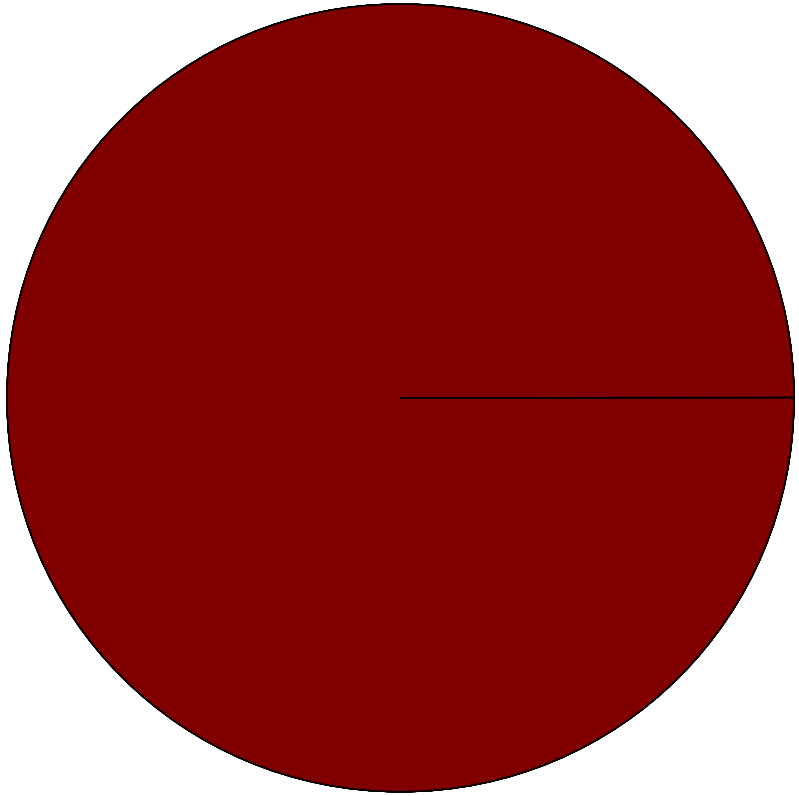

Silver-haired Bat (*Lasionycteris noctivagans*)


Northern Long-eared Bat (*Myotis septentrionalis*)


Federal Trust Species
Indiana bat
Northern long-eared bat
Virginia big-eared bat
State Trust Species
Hoary bat
Eastern red bat
Silver-haired bat

SPRING 2015 - 921 BAT PASSES

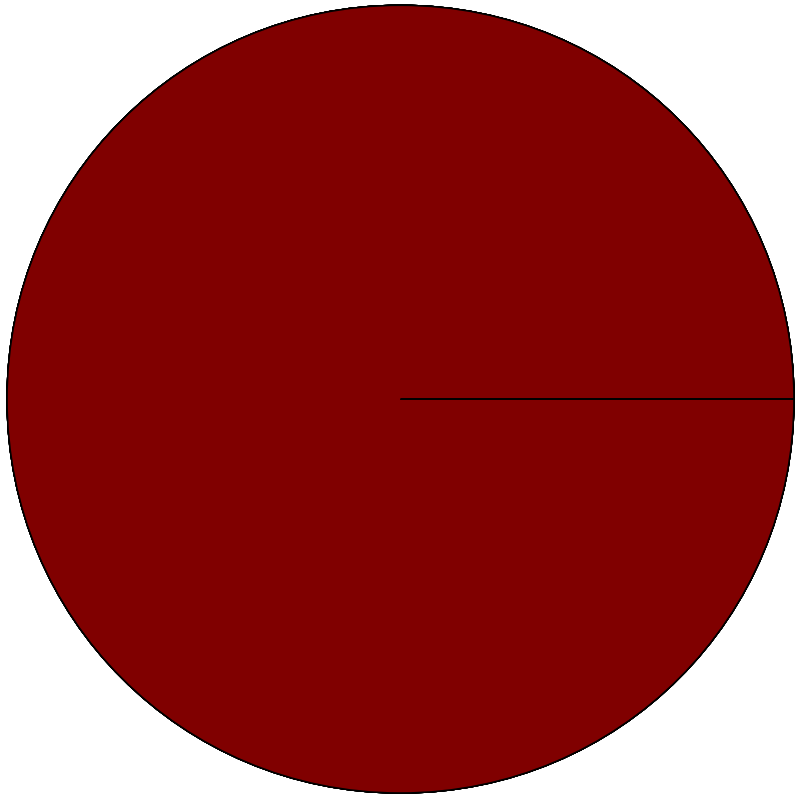
205 DETECTOR NIGHTS



- EASTERN RED BAT
- HOARY BAT
- SILVER-HAIRED BAT
- BIG BROWN BAT
- SMALL-FOOTED BAT
- LITTLE BROWN BAT
- NORTHERN LONG-EARED BAT
- INDIANA BAT
- TRI-COLORED BAT

SUMMER 2015 - 1545 BAT PASSES

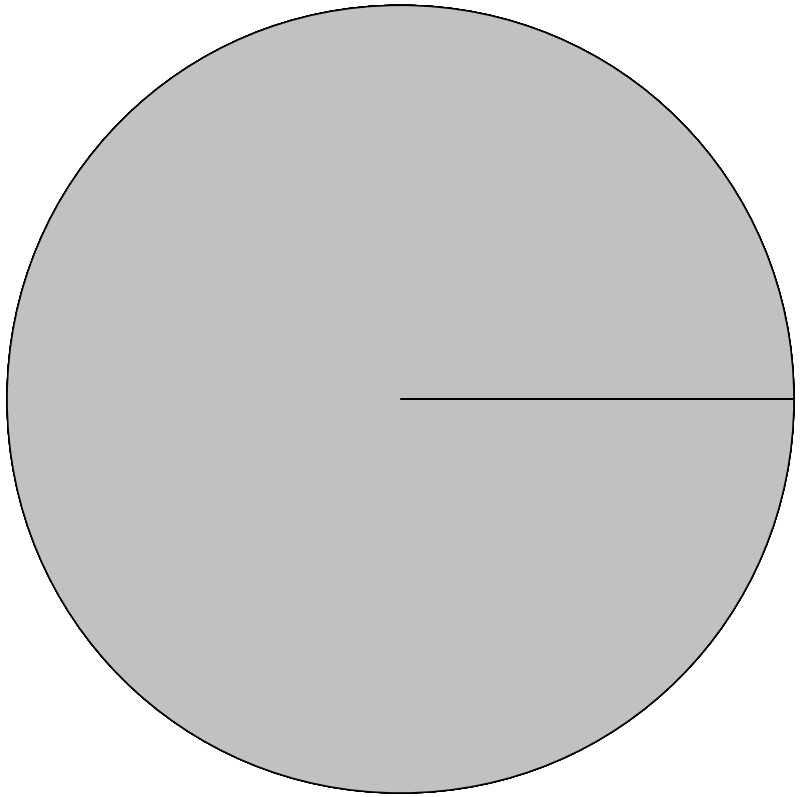
146 DETECTOR NIGHTS



- EASTERN RED BAT
- HOARY BAT
- SILVER-HAIRED BAT
- BIG BROWN BAT
- SMALL-FOOTED BAT
- LITTLE BROWN BAT
- NORTHERN LONG-EARED BAT
- INDIANA BAT
- TRI-COLORED BAT

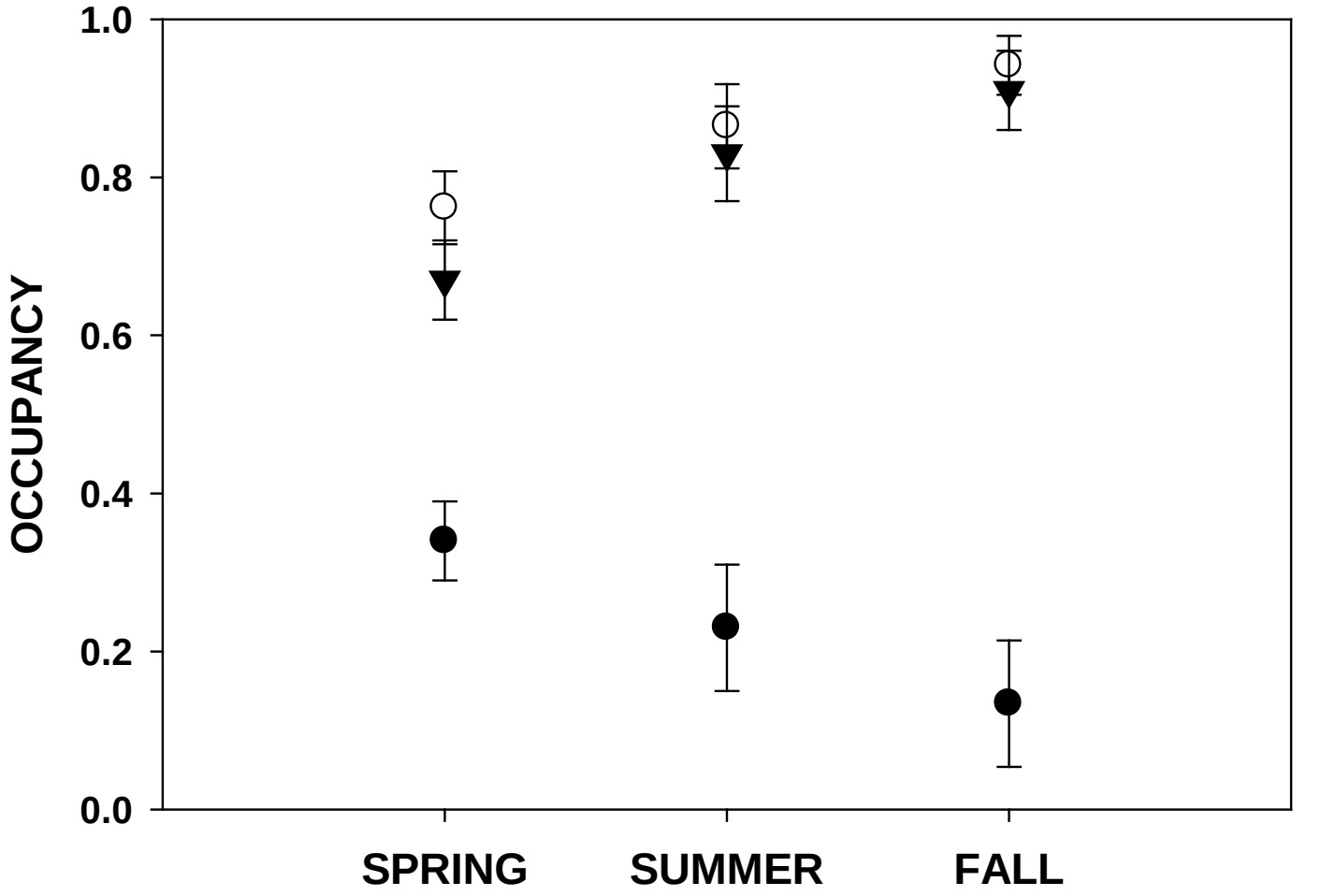
FALL 2015 - 539 BAT PASSES

158 DETECTOR NIGHTS

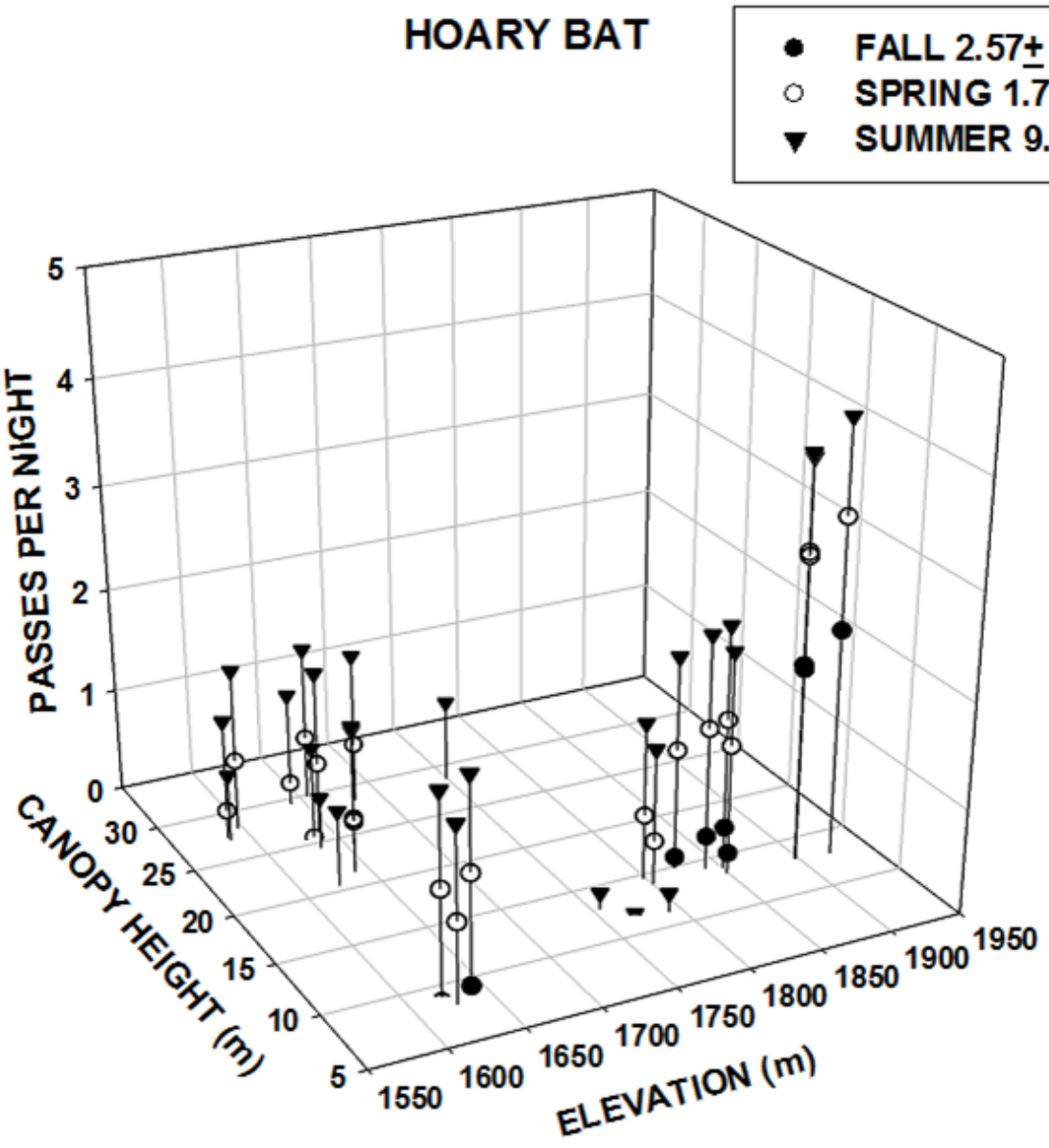


EASTERN RED BAT
HOARY BAT
SILVER-HAIRED BAT
BIG BROWN BAT
SMALL-FOOTED BAT
LITTLE BROWN BAT
NORTHERN LONG-EARED BAT
INDIANA BAT
TRI-COLORED BAT

TREE BATS IN SPRUCE-FIR



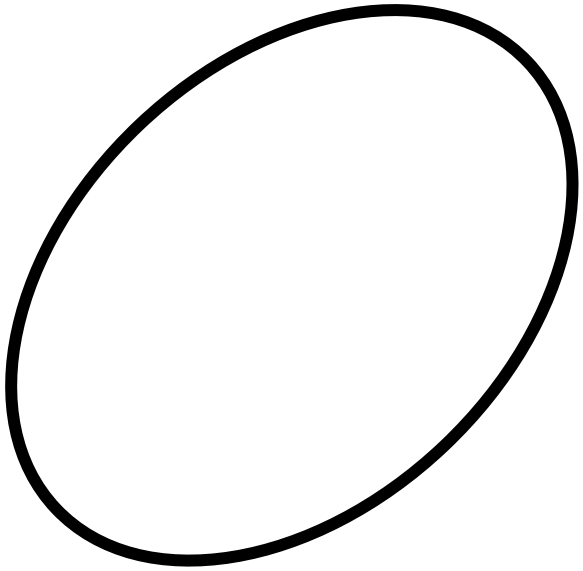
● EASTERN RED BAT - detection probability = 0.14 + 0.10
○ HOARY BAT - detection probability = 0.56 + 0.02
▼ SILVER-HAIRED BAT - detection probability = 0.41 + 0.25



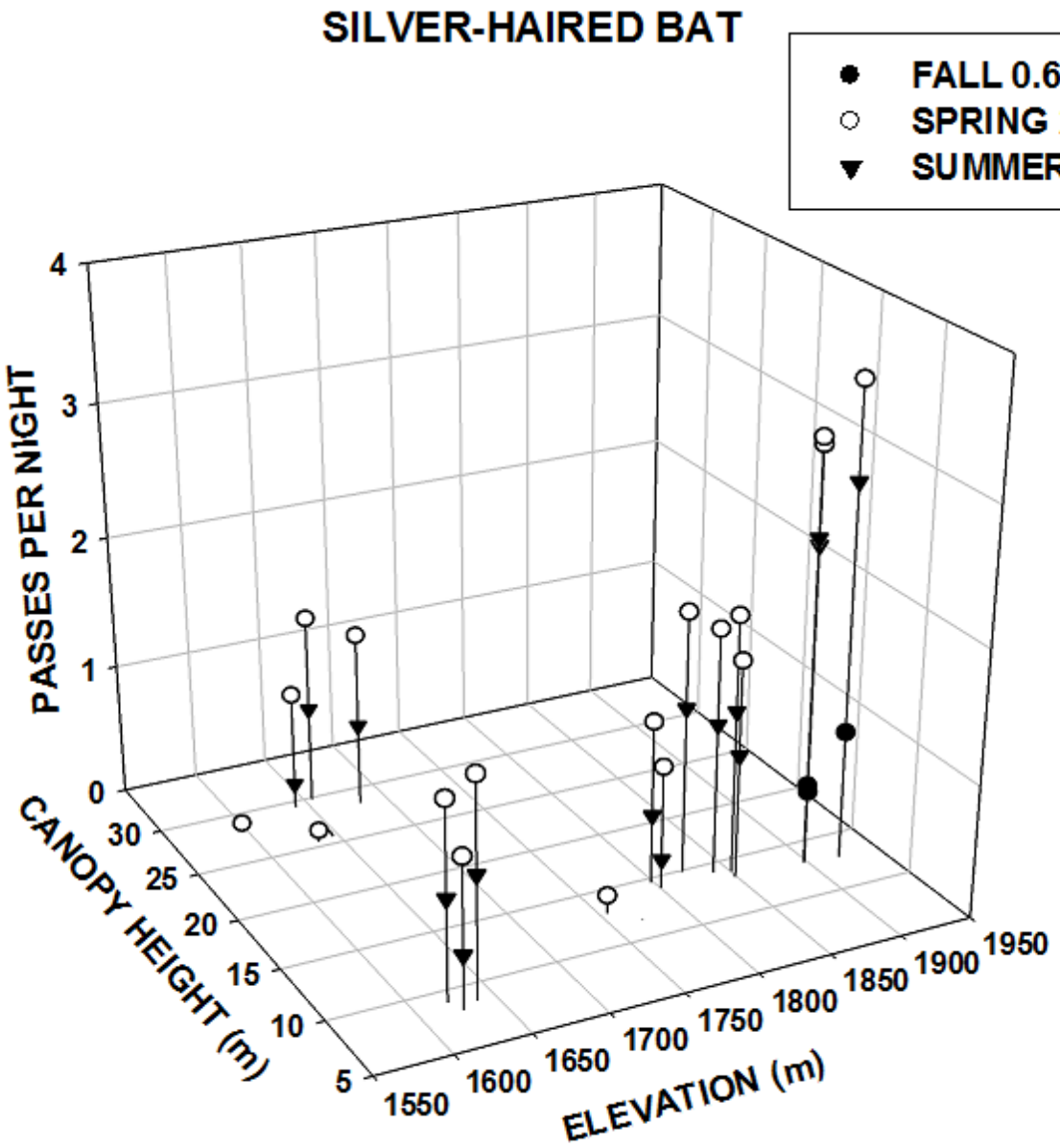
vs. SHEN NP

FALL 2.85
SPRING 29.8
SUMMER 19.6

Tennessee

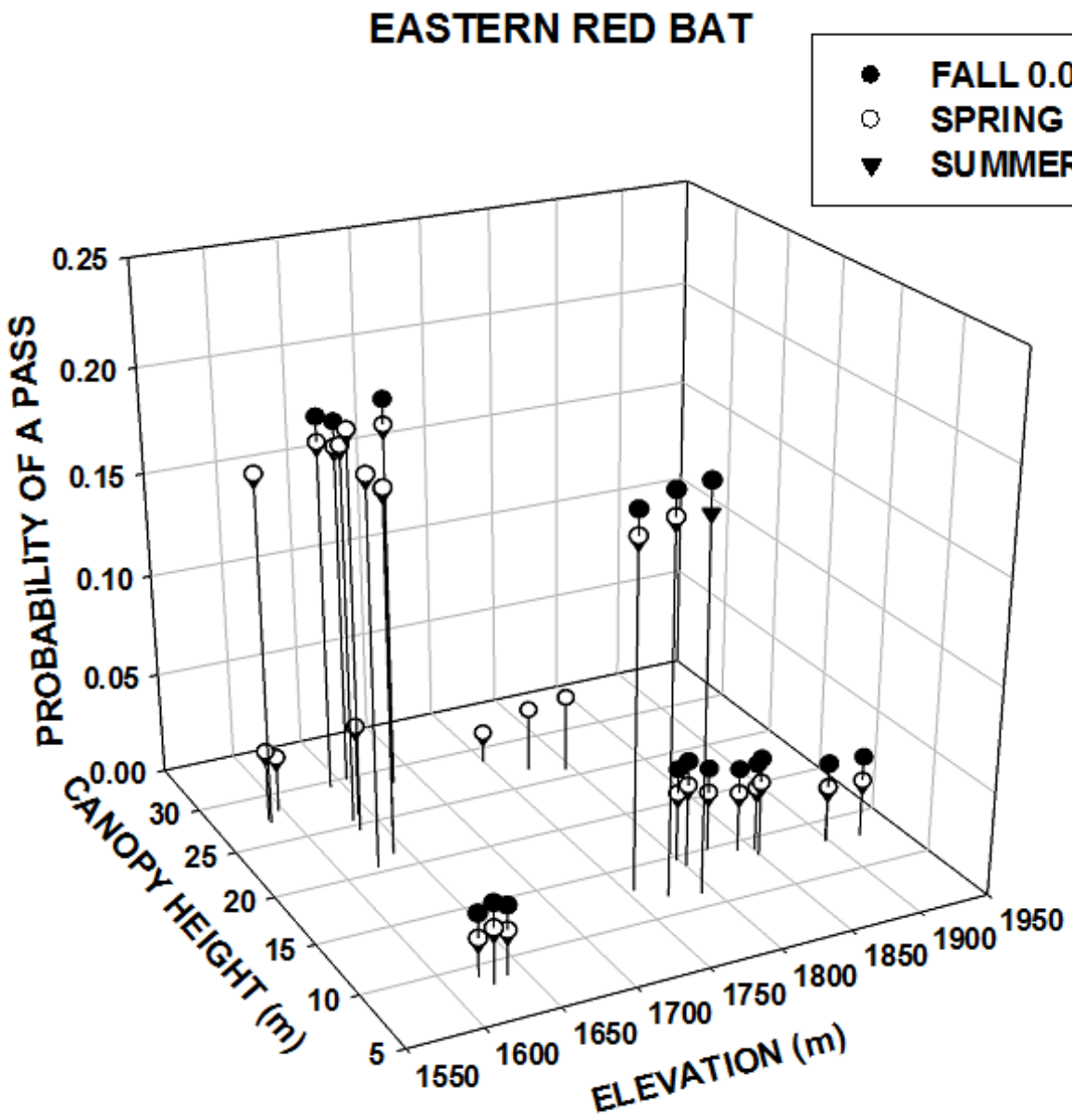


North Carolina



vs. SHEN NP

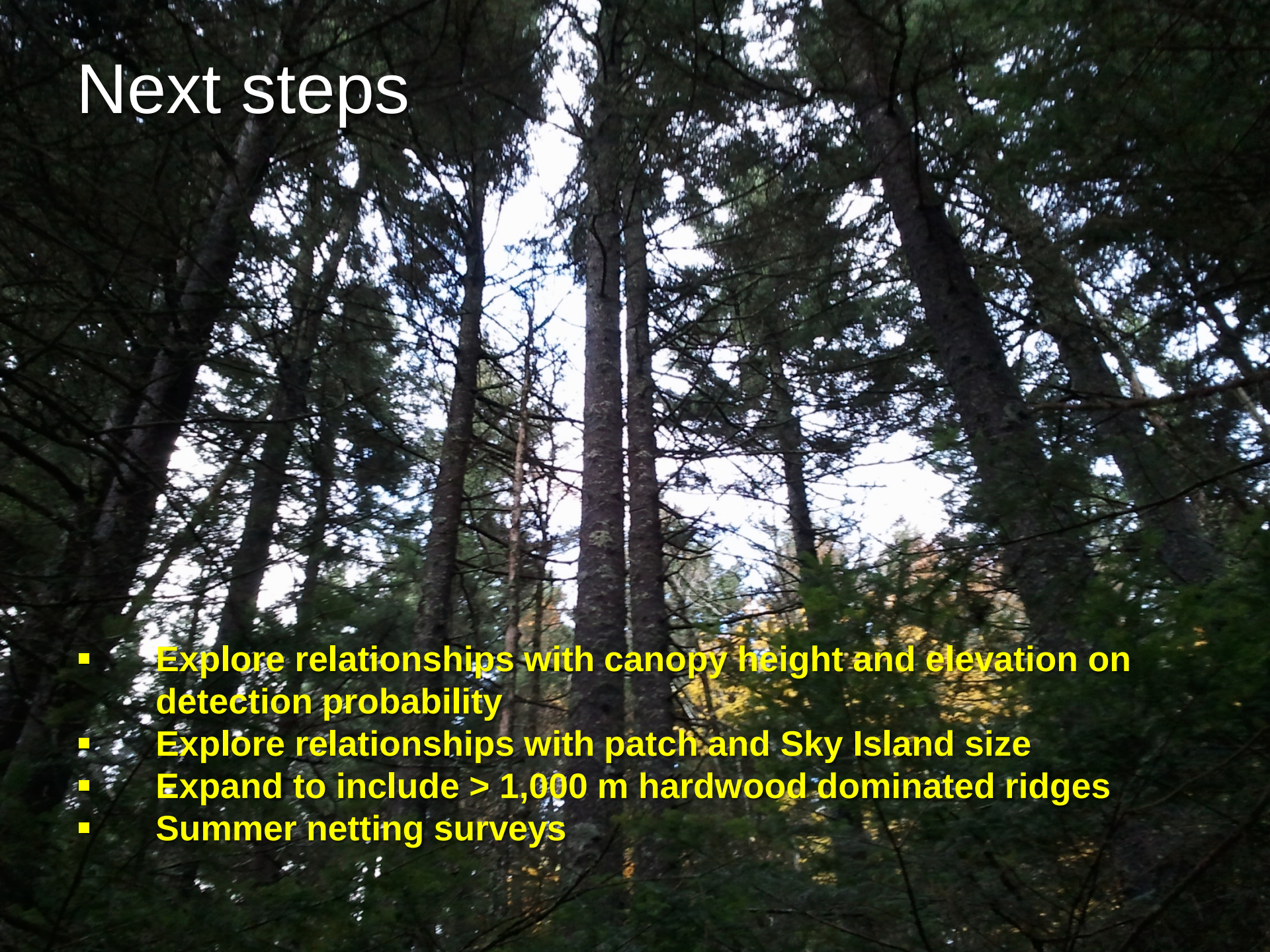
FALL 10.05
SPRING 14.6
SUMMER 13.58



vs. SHEN NP

FALL 6.75
SPRING 1.7
SUMMER 5.9

Next steps



- **Explore relationships with canopy height and elevation on detection probability**
- **Explore relationships with patch and Sky Island size**
- **Expand to include > 1,000 m hardwood dominated ridges**
- **Summer netting surveys**


NORTH CAROLINA
Wildlife
RESOURCES COMMISSION
U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR
USGS
science for a changing world
Road ruts ARE good bat management