ARTIFICIAL ROOST USE BY NORTHERN LONG-EARED BATS IN WEST VIRGINIA FROM 2016-2017

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Introduction

The populations of many bat species have been in decline due to white-nose syndrome (WNS) (Kunz et al. 2011, Grange 2015). Among these bat species, the northern long-eared bat (Myotis septentrionalis) (NLEB) is thought to be most vulnerable to extinction (Silvis et al. 2016). The NLEB was listed as Federally Threatened in April 2015 (USFWS 2018). To offset forest loss, the United States Fish and Wildlife Service (USFWS) West Virginia Field Office (WVFO) has required artificial roosts as conservation measures for Rare, Threatened, and Endangered (RTE) bats.

Fig. 1: Photo of adult NLEB female captured from two-chambered rocket box.

Objectives

- Determine if artificial roost structures have had a positive impact (i.e. reproduction, roosting networks, etc.) on northern long-eared bat conservation in West Virginia.
- Determine if the Myotine Suitable Habitat Assessment Model (MSHAM) (De La Cruz and Ward 2016) was useful in placement of artificial roosts.

Study Area

West Virginia

- Artificial roosts installed on 59 sites in ten (10) counties throughout West Virginia (WV):
  - Brooke, Boone, Clay, Doddridge, Marshall, Pleasants, Ritchie, Tyler, Webster, & Wetzel.

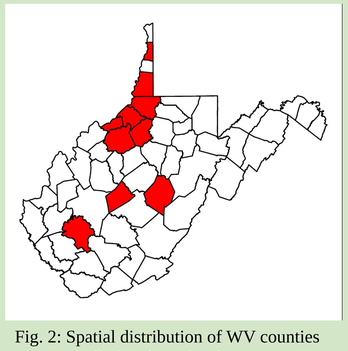

Fig. 2: Spatial distribution of WV counties installed with artificial roosts.

Materials & Methods

Artificial Roost Design & Construction

- AllStar Ecology, LLC. (ASE) designed and produces three (3) types of artificial roosting structures:
  - Two-chambered rocket box
  - Four-chambered nursery box
  - Artificial bark

Fig 3: From L to R: 2-chambered rocket, 4-chambered nursery, and artificial bark.

Artificial Roost Installation

- Roosts installed using the MSHAM to aid in placement.
- Total of 490 roosts installed (380 two-chambered rocket boxes, 53 four-chambered nursery boxes, and 57 artificial barks).

Artificial Roost Monitoring Surveys

- Bi-annual occupation surveys occurred May-August 2016-2017 using a red LED to determine bat occupancy.

Artificial Roost Bat Capture

- If bats were present in an artificial roost, capture was attempted that evening by a permitted biologist to determine species composition and reproductive status.

Fig 4: Photo of a NLEB maternity colony in four-chambered nursery box.

Fig 5: Photo of rocket box trap created by Neil Lafleur (ASE Bat Biologist).

Results

- Site occupancy averaged 72.9% for both years.
- Box occupancy rose by 24.64% for roosts in their 2nd year of monitoring.
- 2016 – 8 NLEB maternity colonies found in artificial roosts.
- 2017 – 14 NLEB maternity colonies found in artificial roosts.
- Site fidelity at 5 of 59 sites in 2017.

Results (Continued)

- 98.36% (359) of bats captured were NLEB (see Table 1).

Table 1: Number of bats captured from artificial roosts by species and year.

Bat Species	2016	2017
NLEB	131	228
EPFU	4	2
Total	135	230

- MSHAM results (see Table 2).

Table 2: 2016-2017 bat occupancy per MSHAM ratings.

	Unsuitable	Low	Fair	Good	High	Total
Total boxes with bat presence 2016-2017	9	10	42	126	71	258
Total Installed 2016-2017	27	25	90	236	112	490
Occupancy Rating per MSHAM Rating	33.30%	40.00%	46.67%	53.39%	63.39%	52.65%

Discussion

- Higher artificial roost occupancy and maternity colonies in 2nd year due to longer time period on the landscape.
- Higher bat occupancy seen in higher MSHAM ratings.

Conclusions & Management Implications

- NLEBs use artificial roosts as part of their roosting network and reproduction process in WV.
- Success has shown artificial roosts as viable conservation measures after tree clearing.
- MSHAM was useful in placement as the higher the rating, the more likely a bat would occupy a structure.

Literature Cited

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