Artificial roost structure use by Indiana bats in wooded areas in central Indiana
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This study documented use of artificial roost structures by two federally endangered Indiana bats *Myotis sodalis*. Designed to determine if Indiana bats will roost in man-made structures, the study is being conducted near the Indianapolis International Airport. Potential roosting habitat for Indiana bats was lost as the result of runway construction. As partial fulfillment of habitat replacement requirements, 3,202 artificial roost structures were placed in wooded areas near the airport. Artificial structures are checked a minimum of once per year for the presence of roosting bats. This poster provides documentation of two adult male Indiana bats roosting in artificial structures. The first bat was found in a single bat box on 26 June 1995 and fitted with a radio transmitter. During eight days the bat was tracked, it was found in natural roosts on three occasions and artificial roosts (another single box, a triple box, a cedar shake garland) on five occasions. This suggests the bat found artificial roost sites equally suitable to natural roosts. This is the first documented observation of an Indiana bat using man-made structures. Natural roosts used by the bats were an American elm *Ulmus americana* and a shagbark hickory *Carya ovata*. The second bat was found in a triple bat box on 25 June 1996 and fitted with a radio transmitter. The bat was tracked later that day to a single box before the signal was lost. Prior to roost structure installation, the density of potential roosts in the woodlot was 15 trees per hectare; after structure installation the density of potential roosts was raised to 30.4 roost sites per hectare. By monitoring artificial roost structures during the next four years we hope to further identify roost site preference by this species.

Risk contours used to delineate safe / unsafe chemical aerosol concentrations for *Myotis sodalis* and *Myotis grisescens*
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Certain military installations use aerosols that may be toxic to endangered species. Military aerosols are commonly released from grenades, smoke pots, and generators and function as obscurants for troops and equipment. To determine the toxicity of aerosols and at what concentrations they cause adverse toxic effects, toxicity threshold values were determined for specific aerosols being studied. Threshold values are concentrations that are expected to result in adverse toxic effects. We selected NOAEL (No Observable Adverse Effect Level) as our toxicological benchmark value. Specific *Myotis sodalis* and *Myotis grisescens* NOAEL values were not available for any of the aerosols under investigation. NOAEL values for *Myotis sodalis* and *Myotis grisescens* were estimated by normalizing (adjusting for differences in doses based on body weight) values reported for standard laboratory test animals (e.g. rats, mice, guinea pigs). The normalized NOAEL values for the two species of bat were used in an air dispersion model to determine the distance the NOAEL concentration travels from release points. Down wind and cross wind dispersion were modeled. Risk contours were developed to depict areas where toxicity threshold values may be exceeded. Chemical release guidelines were based on developed risk contours. These contours indicate how far away from a hibernaculum or maternity colony an aerosol release could occur without causing toxic effects to bats.

Chiropteran hindlimb morphology: Use in determining phylogenetic relationships
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In an ongoing study, I am investigating phylogenetic relationships among bats using characters from the hindlimb. Over 35 characters have been identified through an anatomical comparison of hindlimb bones and related structures in over 40 species of bats (including members of each extant family). Dermoptera and Scandentia were used as outgroups. Some characters (e.g., fusion of digits 3 and 4 in the Thyropterida) appear in only one family, while others (e.g. a bony hook on the greater trochanter of the femur) appear to be homologs shared by some families but not others. Interesting observations include significant structural variation in the calcaneus. In microchiropterans that possess a calcaneus, the base of this structure articulates with the calcaneal tuberosity (the distal end of the "heel bone" in humans). In megachiropterans, the calcaneus does not articulate with the calcaneal tuberosity but emerges proximal to the calcaneus, from the tendon of the