

## Forest Management Practices for Conserving Indiana Bats

The following general guidelines are intended to assist land managers and land owners in managing forests in a way that is consistent with the conservation of the endangered Indiana bat (*Myotis sodalis*). The guidelines consider the Indiana bat's needs for foraging and roosting habitat to survive and successfully reproduce. Note that these guidelines will likely result in habitat that is suitable, but generally less than optimal, for Indiana bats. Application of these guidelines is intended to minimize the risk of "take" of Indiana bats.

### FOREST MANAGEMENT GUIDELINES

1. Retain at least 60% canopy closure within forested stands.
2. Retain all snags, except where they pose a serious human safety hazard due to their location near a building, yard, road or powerline. A tree with less than 10% live canopy should be considered a snag. When possible, delay removal of hazard trees until bats are hibernating (between November 15 and March 31).
3. Do not harvest or manipulate shagbark hickory trees (*Carya ovata*) unless the density of shagbark hickory exceeds 16 trees per acre. If present, maintain at least 16 live shagbark hickory greater than 11" dbh (diameter at breast height) per acre. If there are no shagbark hickory trees greater than 11" dbh to leave, then the 16 live shagbark hickory trees per acre must include the largest specimens in the stand.
4. The following species of trees have been identified as having relatively high value as potential Indiana bat roost trees:

shagbark hickory ( <i>Carya ovata</i> )	eastern cottonwood ( <i>Populus deltoides</i> )
bitternut hickory ( <i>Carya cordiformis</i> )	northern red oak ( <i>Quercus rubra</i> )
mockernut hickory ( <i>Carya tomentosa</i> )	scarlet oak ( <i>Quercus coccinea</i> )
pignut hickory ( <i>Carya glabra</i> )	black oak ( <i>Quercus velutina</i> )
other hickories ( <i>Carya</i> spp.)	white oak ( <i>Quercus alba</i> )
silver maple ( <i>Acer saccharinum</i> )	chestnut oak ( <i>Quercus prinus</i> )
sugar maple ( <i>Acer saccharum</i> )	slippery elm ( <i>Ulmus rubra</i> )
red maple ( <i>Acer rubrum</i> )	American elm ( <i>Ulmus americana</i> )
green ash ( <i>Fraxinus pennsylvanica</i> )	black locust ( <i>Robinia pseudoacacia</i> )
white ash ( <i>Fraxinus americana</i> )	

This list is based on review of literature and data on Indiana bat roosting requirements. Other species may be added as they are identified. Other tree species with exfoliating bark, crevices or cavities could also serve as potential roost trees.

5. At least 3 live trees per acre greater than 20" dbh (of the species listed above) should always be maintained in the stand. These must be the largest trees of these species in the stand. An additional 6 live trees per acre greater than 11" dbh (of the species listed above) must also be maintained.

In areas of the stand where there are no trees greater than 20" dbh to retain, then 16 live trees per acre must be retained, and these must include the largest specimens of the preferred species (see list above) in the stand.

6. No harvest or timber stand improvement activities within 100 feet on both sides of perennial streams, and within 50 feet on both sides of intermittent or ephemeral streams.
7. Do not cut trees between April 1 and November 15. This corresponds to the Indiana bat reproductive and spring/fall emergence and swarming seasons.
8. Do not carry out prescribed burns in forest habitat between April 1 and November 15.