

Healthy Forest Reserve Program - Forest Management Guidelines for the Indiana Bat (*Myotis sodalis*) and Listed Aquatic Species In the Upper Cumberland River Watershed Of Kentucky

These guidelines were developed by the Natural Resources Conservation Service (NRCS) in consultation with Kentucky Field Office (KFO) of the U.S. Fish and Wildlife Service (FWS) to conserve the federally endangered Indiana bat (Ibat) and the following federally listed aquatic species (LAS) and their associated habitats: Blackside Dace (*Phoxinus cumberlandensis*), Palezone Shiner (*Notropis albizonatus*), the Cumberland Darter (*Etheostoma susanae*, a candidate species), Duskytail Darter (*Etheostoma percnurum*) and mussel species such as Cumberland Elktoe (*Alasmidonta atropurpurea*), Cumberland Bean (*Villosa trabilis*), Littlewing Pearlymussel (*Pegias fibula*), Orangefoot Pimpleback (*Plethobasus cooperianus*), and Rough Pigtoe (*Pleurobema plenum*). Adherence to these guidelines will ensure that forestland enrolled in the program (a) is suitable for Ibat use and managed in a way that maintains its suitability, (b) provides improvements in water quality for LAS, and (c) is managed so that avoidance of adverse effects to these federally listed species can be avoided.

Because the risk of incidental take of Ibats and LAS in areas managed in accordance with these guidelines is discountable or insignificant, the KFO will provide a written concurrence letter to the Natural Resources Conservation Service advising them that they are in compliance with Section 7 of the Endangered Species Act as long as these guidelines are followed while implementing the Healthy Forest Reserve Program.

FOREST MANAGEMENT GUIDELINES

1. At least 60% canopy cover (on a stand-by-stand basis) shall be maintained after any timber harvest or management activities. A canopy shall be defined as that formed from a mature tree crown.
2. Any openings created through harvest or forest stand improvement activities shall not exceed 2 acres in size and shall not break connectivity of the stand nor be within 250' of other created openings.
3. Group selection harvesting shall be limited to 10% of a harvest area. Openings created during a group selection harvests shall follow the criteria in number 2 above.
4. At least 5 of the largest shagbark hickory (*Carya ovata*) or shellbark hickory (*C. laciniosa*) trees per acre shall be maintained and not harvested or removed during timber stand improvement (TSI) activities. All forest stand improvement activities shall not use herbicides on shagbark and shellbark hickory.
5. Standing snags shall not be felled/removed, except where they pose a serious human safety hazard (a tree with <10% live canopy can be considered a snag). Snags that have no remaining bark and no visible cracks, splits, or hollows may be felled

(because they are not considered to be Indiana bat habitat) as well as any snags leaning more than 45° from vertical.

- The following species of trees have been identified as having relatively high value as potential Indiana bat maternity and roost trees:

shagbark hickory (<i>Carya ovata</i>)	eastern cottonwood (<i>Populus deltoides</i>)
shellbark hickory (<i>Carya laciniosa</i>)	northern red oak (<i>Quercus rubra</i>)
bitternut hickory (<i>Carya cordiformis</i>)	post oak (<i>Quercus stallata</i>)
silver maple (<i>Acer saccharinum</i>)	white oak (<i>Quercus alba</i>)
sugar maple (<i>Acer saccharum</i>)	slippery elm (<i>Ulmus rubra</i>)
green ash (<i>Fraxinus pennsylvanica</i>)	American elm (<i>Ulmus americana</i>)
white ash (<i>Fraxinus americana</i>)	black locust (<i>Robinia pseudoacacia</i>)
scarlet oak (<i>Quercus coccinea</i>)	chestnut oak (<i>Quercus prinus</i>),
black oak (<i>Quercus velutina</i>)	

U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) DRAFT Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

At least 3 live trees per acre >20" dbh (of the high-value species listed above) shall always be maintained in the stand (a tree with <10% live canopy should be considered a snag). These "leave trees" shall be determined prior to the first timber harvest of species >20" dbh. Following the first timber harvest, the 3 largest live trees per acre >20" dbh (of the high value species listed above) shall be always maintained in the stand. An additional 6 live trees per acre >11" dbh (of the species listed above) must also be maintained if present. The "per acre" requirement can be expressed as the average per acre on a stand-wide basis.

If there are no trees >20" dbh to leave, then 16 live trees per acre must be left, and these must include the largest specimens of the listed species remaining in the stand.

- Tree harvest activities must occur between November 15th and March 31st to ensure adverse effects to the Ibat are avoided.
- Forest Stand Improvement activities shall be completed through methods that leave deadened trees standing except in cases where deadened snags pose a safety concern or are too small to girdle and leave standing. All forest stand improvement activities that require the felling of a tree must be completed between November 15th and March 31st to ensure avoidance of adverse effects to the Indiana Bat.
- Timber harvest activities occurring within a 125' Streamside Management Zone (SMZ) of perennial and intermittent stream will be restricted to single tree selection. The SMZ begins at the top of the stream bank and extends 125' on each side of the stream if applicable. Harvest and forest stand improvement activities within the SMZ shall ensure canopy cover of mature trees exceeds 80%. No forestry skidders or heavy machine use shall be permitted within the SMZ except at designated crossings.

These crossings must be installed and used according to the current version of the “Kentucky Forest Practice Guidelines For Water Quality Management” developed by the University of Kentucky, Cooperative Extension Service. Trees harvested in the SMZ must be removed without heavy machinery entering the SMZ in a way that provides the least amount of soil disturbance (e.g. cables).

10. Additional forest management requirements could be identified if habitat critical to a target species is identified. Examples of these could be additional harvest setbacks from bat hibernaculum or state or federal listed plant populations. Consultation with the Service will occur where the potential for adverse effects to other listed species exists.
11. In addition to Items 1 – 10 above, all forest management activities shall follow best management practices according to the Kentucky Forest Practice Guidelines For Water Quality Management” developed by the University of Kentucky, Cooperative Extension Service.
12. In addition to the management guidelines required above, the Restoration Plan will include conservation practices that are needed to ensure easement Conservation Values are achieved and maintained. This plan will be developed by NRCS and the participant in consultation with the USFWS and the Kentucky Division of Forestry (KDF) or other forestry professional as approved by NRCS. Required practices may include Forest Stand Improvement (666), Shallow Water Development and Management (646) – Ephemeral Pools, Upland Wildlife Habitat Management (645) – Cave Gates, Fish Passage (396), and Stream Habitat Improvement and Management (395).