

**BFO Management Guidelines for Healthy Forest Reserve Program on Copperbelly Watersnakes (*Nerodia erythrogaster neglecta*) and Indiana Bats (*Myotis sodalis*) within the State of Indiana**

These guidelines were developed by the Bloomington Field Office (BFO) of the U.S. Fish and Wildlife Service (FWS) to conserve the federally threatened copperbelly watersnake (CWS) and endangered Indiana bat (Ibat) and their associated habitat within the State of Indiana. Adherence to these guidelines will result in forest and wetland habitat that is suitable for CWS and Ibat use, and will result in the avoidance of take of these listed species.

Because the risk of incidental take of CWS and Ibat in areas managed in accordance with these guidelines is discountable or insignificant, the BFO 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 70% canopy cover (on a stand-by-stand basis, depending on size of stands) shall be maintained after any timber harvest activities. A canopy shall be defined as that formed from a mature tree crown.
2. Shagbark hickory (*Carya ovata*) or shellbark hickory (*C. laciniosa*) trees shall not be harvested or removed during timber stand improvement (TSI) activities, unless the combined density of these species exceeds 16 trees/acre. If present, there shall be no more than 15% of the combined stem density of these two species manipulated (ie. girdled) by TSI activities. All TSI activities shall not use herbicides on shagbark and shellbark hickory.
3. Standing snags shall not be felled/removed, except where they pose a serious human safety hazard (a tree with <10% live canopy should be considered a snag). Snags that have no remaining bark and no visible cracks, splits, or hollows may be felled as well as any snags leaning more than 45° from vertical.
4. The following species of trees have been identified as having relatively high value as potential Indiana bat maternity 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> )

(Tree species based on literature and unpublished roosting data).

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" will be based on species specific age classes and shall be determined prior to the first timber harvest of species >20" dbh. Following 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 (a tree with <10% live canopy should be considered a snag). An additional 6 live trees per acre >11" dbh (of the species listed above) must also be maintained. The "per acre" requirement can be expressed as the average per acre on a stand-wide basis, depending on the definition of a stand.

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.

5. Timber harvest or TSI activities occurring within 100 feet of a perennial stream, intermittent stream or emergent or scrub-shrub wetland will be restricted to single tree selection. No forestry skidders or heavy machine use shall be permitted within the zones. All harvested trees must be removed in a way that provides the least amount of soil disturbance (e.g. cables).
6. No felling or manipulation of trees >3" dbh while CWS and Ibats may be present from 1 April through October 31 (i.e., trees may be felled or manipulated from 1 November through March 31).
7. Group selection harvesting shall be limited to 10% of harvest area, with openings not to exceed 2 acres. All openings shall not break connectivity of the stand, nor be within 1 acre of the nearest other group selection harvest.
8. In addition to Items 1 – 7, all forest management activities shall follow best management practices.

## **WETLAND MANAGEMENT GUIDELINES**

1. Management and restoration treatments shall be timed according to specific biological periods of time to minimize the risk of negative impacts to the CWS. Equipment operators and others onsite shall monitor CWS activity while applying these treatments to avoid direct impacts to individual snakes.
  - A.1. Earth work to restore wetlands shall be conducted between 1 May and 1 October.
  - A.2. Implementing projects to plant or maintain desired vegetation using mechanical treatments, including planting or mowing, shall **not** be conducted between 1 April and 31 October.. However, tree planting in areas of unsuitable habitat (e.g. agricultural land) may be undertaken inside this timeframe if identified in the initial ranking process by a USFWS representative.
2. Known hibernacula shall not be disturbed. Areas that are potential CWS hibernacula, such as crayfish burrows, will be avoided to the maximum extent possible.
3. Wetland basins shall not be restored in a manner that makes them suitable to over winter fish, and landowners shall be advised not to attempt to stock fish.
4. Water within restored wetlands shall not be purposely drawn down or raised during the winter.

## **PRESCRIBED FIRE GUIDELINES**

1. Prescribed burns shall not be conducted from 15 April through 31 October..
2. Temporary fire breaks shall be created/maintained around any known Indiana bat primary maternal roost trees that fall within a proposed burn area prior to the burn.