Habitat Conservation Plan Field Notes

TREE REMOVAL – For the purpose of the habitat conservation plan (HCP), tree removal is defined as the removal of trees greater than 9 inches diameter at breast height (DBH). Avoidance measures that limit tree removal activities do not apply to the following, except within 150' of a known bat maternity roost during April 1 – August 31:

- Trees less than 9 inches DBH.
- Eastern red cedars.
- Live exotic invasive trees (e.g., Bradford pear, tree of heaven).
- Brushy exotic invasive species (e.g., bush honeysuckle, autumn olive).
- Multi-stemmed trees where none of the stems are greater than 9 inches DBH (e.g., Osage orange).

Site	Buffer Size	Tree Removal	Prescribed Fire (RxB)
All Caves on MDC Lands	20 acres	Avoid tree removal during periods of March 15–April 30 and Sept. 15–Oct. 31. Manage toward old growth.	Minimize RxB during the periods of March 15–April 30 and Sept. 15–Oct. 31. During Sept. 15–April 30, RxB should be conducted under conditions that maximize smoke dispersal and will care smoke away from the hibernacula entrance.
Priority Hibernacula	5 miles	Avoid tree removal during March15–April 30 and Sept. 15–Oct. 31.	
Sodalis Nature Preserve	10 miles	Permitted ONLY during Nov. 1–March 14.	Permitted ONLY during Nov. 1–March 14.
Noise Minimization Measures	Avoid activities that produce more than 85 decibels within 50 feet of known hibernacula. Avoid blasting or pile driving within ¼ mile of known hibernacula; if unavoidable, then conduct between May 1–Sept. 14.		

		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Annual Cycle		Hibernation				Emergence, Migration	Migration, Maternity Colony Establishment		Pups are Flightless		Maternity Colony Breakup	Migration, Swarming, Breeding	
Maternity Roost Buffers (150')	**Tree Removal and Prescribed Fire (RxB)**	Protect known maternity roost trees					Avoid all tree removal and RxB					Protect known maternity roost trees	
Priority Bat Management Zone (PBMZ)	**Tree Removal**	Follow PBMZ management plan					Avoid removal of trees greater than 9 inches DBH					Follow PBMZ management plan	
	RxB	Follow PBMZ management plan						Avoid RxB		Follow PBMZ management plan			

Habitat management on MDC lands outside of a PBMZ, hibernacula buffer, or maternity roost buffer

Implement roost tree retention guidelines in all forest and woodland habitats on MDC lands:

- Retain all snags except where public or worker safety concerns exist.
- Retain all known maternity roost trees for covered bats.
- Retain patches or aggregations of trees, which are generally preferred over a scattered distribution of trees.
- Retain multiple den trees, unless none are found:
  - Retain a minimum of three den trees (optimum of seven) per acre in heavily forested areas (defined as 70-100 percent forested).
  - Retain up to 25 den trees per acre in riparian forests.
  - Prioritize den trees with cavities higher than 20 feet above the ground.
  - When den trees are not present, retain a 0.2-acre (105-foot-diameter) group of trees around at least one large-diameter tree that may potentially serve as a den tree.
- Retain two to four super-canopy trees (trees that are taller than the surrounding trees), or those with potential to become such trees, per acre in riparian areas and bottomland forests to promote structural diversity and provide large leafy surfaces for foraging.
- When creating snags, MDC and landowners participating in the HCP will leave, if present:
  - One existing, potential, or future snag greater than 20 inches DBH per acre.
  - Four existing, potential, or future snags between 10–20 inches DBH.

Even-Aged Stand Management Conservation Measures	Uneven-Aged Stand Management Conservation Measures
Snag Retention	
Retain all snags except where public or worker safety concerns exist or where catastrophic weather events or disease or insect outbreaks in a stand constitute a threat to the health of the surrounding forest.	Retain all snags except where public or worker safety concerns exist or where catastrophic weather events or disease or insect outbreaks in a stand constitute a threat to the health of the surrounding forest.
Retain Patches/Leave Trees	
In stands ≥ 20 acres where harvest reduces basal area below 30 ft^2/ac, uncut patches totaling at least 5% of the harvested area will be retained. In stands ≥20 acres where harvest reduces basal area below 30 ft^2/ac, create leave-tree patches that are variable in size (but a minimum of 0.25 acre) and located throughout the harvest unit. When working in a riparian corridor, depending on stocking rate, always leave at least ⅓ of the typical-sized trees and 40 ft^2 of basal area or greater. One-half to ⅔ of typical-sized trees is recommended. In stands ≥20 acres where harvest reduces basal area below 30 ft^2/ac, leave one or more large live trees (retain hickory 16" or greater DBH if available), otherwise retain trees > 18" DBH or as large as available) to provide for a continuous supply of future roost trees. In stands ≥20 acres where harvest reduces basal area below 30 ft^2/ac, locate leave-tree patches near or adjacent to riparian management zones, wetlands, or seasonal pools. Wildlife openings are encouraged; however, riparian buffers should not be used for all reserve islands because snag and leave-tree patches are also important in upland forest treatments. Locate patches in draws and along protected slopes, near the edge of the stand on ridge-top locations, or just below the ridge to reduce the potential for windthrow. Focus patches to coincide with such features as wetland inclusions, ponds, one or more active den or cavity trees, or at least good candidates for potential cavities.	Maintain a minimum basal area of 30 ft^2 and where possible retain at least 16 live trees greater than 9" DBH per acre (with at least 6 trees per acre of the largest available trees of species favored by roosting bats, which will vary by bat species and geographic location). Where insufficient large trees (≥ 9" DBH) are available to meet silvicultural management needs while providing the number and size of trees noted above, use the 16 largest trees available per acre, to provide adequate canopy cover and roost-tree availability. When working in a riparian corridor, always leave at least ⅓ of the typical-sized trees.
Openings	
If openings are created for forest regeneration, those stands will be thinned and/or burned during appropriate seral stages to create and maintain high-quality foraging habitat in the future.	Create relatively small openings (< 5 acres) where practicable because they may provide the best balance between maintaining foraging and roosting habitat. Where practicable, maximize the amount of edge habitat (e.g., through the creation of long and narrow openings) to provide a greater amount of foraging habitat and additional predator protection. When creating openings, consider both the bat species and the amount of sunlight needed for forest regeneration. Larger openings provide more sunlight to regenerate future roost trees. However, an opening too large (> 45 acres) may affect bat occupancy.

Implement bat-friendly management measures within prescribed burn plans:

- Prescribed burn plans should be written to ensure conditions are conducive to maintaining scorch heights less than 15 feet from April 1 – August 31 in high-quality bat roosting habitat. Use ignition tactics that reduce fire intensity and flame length so that the critical plume temperature at which bats could be injured (140°F) does not reach roost height. The covered bats typically roost 15–30 feet above the ground. Leaf scorch (when leaves are visibly damaged) and trunk scorch are good indicators of when bats are at risk.
- To minimize impacts on roosting bats, retain snags within fire lines when and where they do not pose a hazard to public or worker health and safety.