

Appendix E

RESEARCH NEEDS

1. Determine whether the cliffline prescription area is appropriate to maintain desired microclimate and hydrologic conditions.
2. Earlier work with white-haired goldenrod indicated that the species might be suffering from genetic depression. Work to determine genetic changes following controlled crosses is needed to see if such crosses would benefit the species without genetic loss.
3. Vegetation response to regular prescribed fire is needed to help managers make better decisions for actions on the ground.
4. The response and potential control or encouragement of invasive non-native weeds following increased use of prescribed burning is needed.
5. Determine the effect of forest overstory management and prescribed burning on the incidence of use of treated areas by Indiana bats.
6. Determine regional relationships between stream discharge, basin drainage area and stream channel geometry in the Licking and Kentucky basins.
7. Determine historical pre-European distribution of yellow pine forest types on the escarpment.
8. Determine forest community change throughout the Holocene.
9. Determine the distribution of various age classes and vegetative types and determine which age classes or vegetative types may be lacking but needed for certain bird life history requirements.
10. Develop treatments to protect forest from devastating introduced insects and diseases, particularly oak decline (including gypsy moth defoliation induced as a special case), and hemlock woolly adelgid.
11. Determine rates of nest predation and parasitism by the brown-headed cowbird in various habitats and management regimes.
12. Determine how best to use fire to regenerate and initiate stands of oak-pine and pine-oak.
13. Determine how best to regenerate and maintain uneven-age (multi-age) stands of various native forest types.
14. Determine seasonal movement of blackside dace.
15. Determine the life history of duskytail darter.
16. Determine minimum viability of all species on the forest.
17. Determine the life history of PETS mussel species.
18. Determine the feasibility of artificial reproduction of the mussels specifically *Pegias*, *Villosa*, and *Alasmodonta*.
19. Determine the effects of sediment and sedimentation on aquatic insects, fish and mussels.
20. Determine the effects of soil compaction and trampling on archeological deposits in rockshelters.



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