

Proactive Cave Management on the Hoosier National Forest

*Julian J. Lewis, J. Lewis & Associates, LLC
Cave, Karst & Groundwater Biological Consulting
E-mail: Lewisbioconsult@aol.com*

*Kelle Reynolds
Karst Coordinator and Wildlife Biologist
Hoosier National Forest*

Abstract

The Hoosier National Forest encompasses a significant part of the karst of southern Indiana. Over 130 caves have been found on National Forest Service lands including the Lost River Cave System (17 miles of mapped passages) and Gory Hole (deepest pit in Indiana). Many caves have been given enhanced conservation status due to their location within designated forest service special areas or designated wilderness areas. Examples are Dillon Cave (Grease Gravy Special Area), Gypsy Bill Allen Cave (Gypsy Bill Allen Special Area), Gory Hole (Tincher Karst Special Area), Lost River Cave System (Wesley Chapel Special Area) or Patton Cave (Charles Deam Wilderness Area). Proactive management involves a detailed understanding of the caves with documentation of the complex resources involved. Through co-

operation with the Indiana Karst Conservancy caves and karst features are being inventoried and mapped. A detailed bioinventory of caves on the Hoosier National Forest is being conducted and is providing a data-intensive basis for cave management plans. As a result of the cave bioinventory over 60 species have been placed on the Region 9 Regional Forester List of Sensitive Species. For each of these species a detailed conservation assessment is prepared as well as an assessment of the habitat and community in which it occurs. These assessments include a list of the caves from which each species is known, habitat requirements, analysis of threats, conservation actions currently being taken and provisions for the management of the species and their unique habitats.

The Hoosier National Forest encompasses a significant part of the karst of southern Indiana. At present 136 caves have been found on National Forest Service lands including the Lost River Cave System (17 miles of mapped passages) and Gory Hole (deepest pit in Indiana). Proactive management involves a detailed understanding of the caves with documentation of the complex resources involved. A multi-faceted approach has been developed for conservation management of caves and karst on the Hoosier National Forest

Cave resource inventory

Through cooperation with the Indiana Karst Conservancy caves and karst features are of the Hoosier National Forest are being inventoried. The cave resource values inventory includes characterization of the cave as well as biological, geological and cultural features. The cave information is placed on the Indiana Cave Survey database (<http://www.caves.org/survey/ics/>).

Subterranean bioinventory

A detailed bioinventory of subterranean habitats including caves, springs and wells on the Hoosier National Forest is being conducted and is providing a data-intensive basis for cave management. Between 2000 and 2003 a total of 120 caves have been sampled for fauna, of which 51 species were classified as obligate subterranean species and 73 were of significant global rarity, that is G1-G3 (Lewis, Burns, and Rafail, 2003).

Regional Forester's List of Sensitive Species

As a result of the cave bioinventory over 40 species have been placed on the Region 9 Regional Forester List of Sensitive Species. For each of these species a detailed conservation assessment has been prepared. Each includes an executive summary, includes a list of the caves from which each species is known, habitat requirements, analysis of threats, conserva-

tion actions currently being taken and provisions for the management of the species and their unique habitats. These assessments are available on the internet at, for example for the troglobitic beetle *Pseudanophthalmus youngi*: http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/insect_Pseudanophthalmus_youngi-YoungsCaveBeetle.pdf

Community conservation assessments have also been prepared for: (1) cave streams, (2) riparian cave habitat, (3) non-riparian terrestrial cave habitat, (4) cave guano habitats, (5) springs, (6) epikarstic aquifer habitat, (7) interstitial aquifer habitat, and (8) hyporheic habitat.

These assessments include an: (1) executive summary, (2) description of the habitat and community, (3) environmental conditions, (4) current community condition, distribution and abundance on the Hoosier National Forest, (5) Regional Forester Sensitive Species, (6) potential threats, (7) summary of land ownership and existing habitat protection, (8) summary of management and conservation activities, (9) research and monitoring, and (10) pertinent references. An example of a community conservation assessment can be found at:

http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/riparian_cave_habitat.pdf

Cave management plans

Cave and karst habitat located on the Hoosier National Forest are subject to standards and guidelines for caves and karst protection and management as outlined in the Hoosier National Forest Land and Resource Manage-

ment Plan (Forest Plan) (USDA Forest Service 1991, 2000). These standards and guidelines include the following:

- Caves are protected and managed in accordance with the Federal Cave and Karst Resources Protection Act of 1988, Forest Service Manual 2353, Memorandums of Understanding between the forest service and the National Speleological Society, the Indiana Karst Conservancy, Inc., the Forest Cave Management Implementation Plan, and individual specific cave management plans.
- Except where modified by an existing cave management prescription, vegetation within a 150- to 200-foot radius of cave entrances and infeeder drainages with slopes greater than 30 percent will generally not be cut. No surface disturbing activities will be conducted on any slopes steeper than 30 percent adjacent to cave entrances. Similar protection areas will be maintained around direct drainage inputs such as sinkholes and swallow holes known to open into a cave's drainage system of any streams flowing into a known cave.
- Allow no sediment from erosion of access roads and drilling sites to wash into caves or karst features.

In addition, management plans are being prepared for every cave in the Hoosier National Forest. These plans include resource inventory in the following categories: (1) biological, (2) geological, (3) paleontological, (4) hydrological, (5) cultural, (6) recreational, and (7) educational. For each cave a management and monitoring plan is specified.

Proactive Management Examples

Planning for the new I-69 linking Indianapolis and Evansville proposed several prospective corridors for the construction. The path for Alternative 5 runs from Indianapolis to Bloomington, then south to Bedford and swings through southern Lawrence County before turning to the southwest and ending at the junction of I-64 and I-164 north of Evansville. This proposed route goes through the Hoosier National Forest Tincher Karst Special Area. The Tincher Karst is characterized by the presence of hundreds of sinkholes, caves and springs. Many of the caves in the area are pits, for example, Gory Hole, the deepest pit in Indiana. As part of the cave bioinventory of Lewis, *et al.* (2003), the fauna of 24 caves had been sampled in the Tincher area revealing the presence of 23 species of troglobites and stygobites. Most of these species were of high global rarity



Biologist ascending the drop in Turtle Plunge, a typical pit in the vicinity of the Tincher Karst Special Area.

(Global Rank of Rarity 1-3) and included taxa endemic to the area, some new to science. Based on this information I-69 Alternative Route 5 was rejected.

The Lost River Cave System is centered around Wesley Chapel Gulf Cave, the third longest cave in Indiana with 17 miles of surveyed passages. The caves of the Lost River System have been rather thoroughly sampled (Lewis 1994; Lewis et al. 2003) and were known to contain a globally significant subterranean fauna of 20 obligate subterranean species. This knowledge was in hand at the time that the Blanton Property was offered for sale. This biological treasure was immediately purchased by The Nature Conservancy based on the proactive data and will be transferred to the Hoosier National Forest.

Literature Cited

Lewis, Julian J. 1994. Lost River cave and karst biological survey. Final Report, U.S. Army Corps of Engineers, Louisville District, Contract No. DACW27-94-M-0110, 63 pages.

Lewis, Julian J.; R. Burns; and S. T. Rafail. 2003. The subterranean fauna of the Hoosier National Forest. Final Report, to Hoosier National Forest, Bedford, Indiana, 164 pages.



The Packards Cave Pseudoscorpion (Kleptochthonius packardi) is an example of an ultrarare troglobite found in caves on the Hoosier National Forest.

USDA Forest Service. 1991. Land and Resource Management Plan Amendment for the Hoosier National Forest.

USDA Forest Service. 2000. Land and Resource Management Plan, Amendment No. 5, for the Hoosier National Forest.