

BIOLOGICAL ASSESSMENT OF FOUNTAIN CAVERN NATIONAL PARK

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As part of the land use planning process in Anguilla, the government is interested in knowing more about the biological resources at existing and proposed park sites. The Fountain Cavern is an underground cave of geologic, historic and biological interest. The government acquired 4.75 acres over and around the cavern in the late 1980's and declared it a national park. To date there has been no development of the site as a park. At the present time there is some discussion about acquiring more land in order to provide a larger "buffer zone" around the cavern itself, and to make the surface area of the park more amenable to additional uses like nature trails, picnic areas, etc.

Site visits were made to collect information on biological resources in the Fountain Cavern area in December, 1995 and January, 1996. This included twilight bat surveys at the cave entrance, bat counts during daylight roosting hours within the cavern, snorkel surveys to confirm the presence of cave shrimp in the pools, and vegetation surveys (quantitative and qualitative). In addition, a literature review was conducted, the pertinent results of which are summarized below.

BATS

The historic information on bats at the cavern is limited to a survey conducted in May, 1988 (Genoways, 1989). The Antillean Cave Bat or Brown Flower Bat, *Brachyphylla cavernarum*, was captured both at the opening and inside the cave in "large numbers". Another visiting scientist estimated the bat colony to contain 150-250 individuals at that time (McFarlane, 1989). *B. cavernarum* is a cave-roosting bat which eats a wide variety of fruits as well as some insects (Genoways, 1996). One specimen of the Funnel-eared Bat, *Natalus stramineus*, was captured at the entrance to the cavern in 1988 (Genoways, 1989). It is an insect feeder whose populations are quite low in the Antilles (Genoways, 1996). The Fountain Cavern may be the only suitable habitat for *N. stramineus* in Anguilla since it must drink freshwater to live, and there are so few deposits of freshwater on the island which are accessible to bats.

The status of the bats of Fountain Cavern was not studied in any way following the survey in 1988 until late 1995. Twilight bat counts were conducted on three separate occasions in December, 1995 and January, 1996. The largest number of bats observed to emerge from the cavern on any one evening was 21. A visual assessment of guano accumulation and roosting habitat within the cavern indicated that the current population of bats within the cavern is quite small. No more than a dozen bats were seen within the cavern on a site visit in January, 1996.

Several hypotheses have been proposed to explain the severe decline in the bat population of the Fountain Cavern between 1988 and 1995. These hypotheses are summarized below.

1. The continued presence of the metal cage over the cavern entrance has negatively affected the bats as they enter and exit the cavern on foraging flights.
2. Some unknown disease or other pathogen affected the colony.
3. The droughts of the early 1990s reduced food supplies and subsequent colony size.
4. The bats starved following Hurricanes Luis and Marilyn in 1995 which effectively stripped every plant on the island of leaves and fruits and decimated insect populations short-term.

Further information about bats, and about their value in ecotourism can be obtained from Bat Conservation International, P.O. Box 162603, Austin, Texas, 78716, USA.

CAVE SHRIMP

The rare cave crustacean *Stygiomysis holthusi* has been reported from the Fountain Cavern (Botosaneanu, 1980 as cited in McFarlane, 1989). Cave shrimp are small, usually blind, invertebrates which inhabit pools of freshwater. They are usually distributed by groundwater connections between caves. If those groundwater connections are severed the shrimp become isolated and often speciate. The only source of organic carbon, or food, in most caves comes from bat guano. That holds true for the pool in the rear chamber of the Fountain Cavern. However, the pool near the entrance probably receives some organic carbon from bat guano and also from dirt and leaves which drift in from the entrance hole and flow downhill to the pool.

In January, 1996 both pools in the Fountain Cavern were visited by two snorkelers with hand-held lights in order to determine whether or not cave shrimp are still present in the pools of the cavern. It took nearly twenty minutes of searching in each of the pools before individual shrimp were sighted. However, it was confirmed that cave shrimp do live in both pools. Specimens were not collected. For the time being, it is assumed that the shrimp in these pools are *Stygiomysis holthusi*.

OTHER ANIMALS IN THE CAVE

There are no other historic reports of animals or insects in the cavern. However, on a site visit in January, 1996 it was noted that a large cockroach, and a small lizard (not typical of *Anolis gingivinus*) were noted inside the cavern. The lizard was on the roots of the trees which descend down the entrance hole. In addition, biting mosquitos were abundant in the front chamber of the cavern throughout the site visit.

Little is known about the current fauna of the Fountain Cavern. This is an area which warrants further detailed study, especially before any additional entrances are opened into the cave ecosystem.

PLANT SURVEY

Site visits were conducted by Oliver Hodge, Mary Walker and Judy Dudley in January, 1996 in order to obtain a plant species richness inventory for the parkland surrounding the Fountain Cavern. A total of 87 plant species were identified (species list attached). It appears that this is one of the more biologically diverse sites studied on the island, with the exception of Katouche. The relatively high plant biodiversity is explained by the fact that there are several habitat types within the grounds of the small park. The habitat types found on-site include: coastal sandy beach, low coastal dunes, evergreen bushland, and herb grassland. Evergreen bushland is the habitat type which covers the greatest area at the site.

A quantitative survey of the species composition of the evergreen bushland habitat at the site was conducted at point-intercepts along replicate line transects. Overall the evergreen bushland habitat at this site has a simple structure. Fifty percent of the sample points had only one species of plant present, indicating that canopy species inhibit understory plants. There were numerous areas (20% of the total points) that had no plants species, but rather were rock or plant litter. This indicates that soil development is poor and that the species present are not always able to establish on limestone pavement. The most common species in this evergreen bushland were: sage cop (*Lantana involucrata*), nanny bunch (*Croton betulinus*), and white cedar (*Tabebuia heterophylla*).

In general the evergreen bushland at the site is rather unremarkable. However, the mixture of habitat types at the site along with lots of disturbance-mediated "edges" (beach edges, road sides, trails, etc.) has resulted in a wide variety of niches which are currently occupied by a relatively diverse mixture of plants. This site has high conservation value not only as the locality of the unique cavern, but also because of its diverse plant community.

REFERENCES

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