

Assessment Report

Interval: October 2010-October 2011

Jester Estates Cave

By: Nico M. Hauwert, PhD, PG 5171

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Jester Estates Cave is a cave listed on the CoA/Travis county Balcones Canyonland Conservation Plan Permit for listed endangered invertebrates.

Introduction

CoA BCP cave biologist Mark Sanders noted during faunal surveys that Jester Estates Cave, is much wetter than when he first found it in the 1990's, and was concerned that the constant saturation might impair habitat. James Reddell reported in Elliott (1997) that Jester Estates Cave was wet with a mud pool prior to the surrounding subdivision construction. In the same report, Lee Sherrod of Horizon Environmental also reported applying Amdro to the preserve in 1991 and drilling 9 boreholes for bait traps.

On October 30, 2008, about two and a half years ago Mark noticed a neighbor had a leaking pool that was fixed but saturated the soil more than halfway of the 230 ft from the pool to the cave entrance. On Thursday June 9, 2011 a pc pipe was observed near the fenceline and pointed toward the preserve that appears to serve to drain swimming pool. From the debris buildup and white precipitate, it looks like flows recently discharged to the preserve from the pipe. Mark also reported seeing dead fire ants and vegetation, where adjacent neighbors may have applied pesticides across the fenceline. A pile of leaves was also observed over a hundred feet in the preserve apparently had been dumped.

In FY2011, additional data was gathered including mapping of the surface catchment, collection of a water sample analysis, mapping of the cave, mapping of the local stratigraphy, and installing of a drip meter to better understand the cave and its water sources. The additional data may also help evaluate impacts or enhancements to the cave.

Surface Catchment

The surface area contributing runoff to the entrance of Jester Estates Cave was mapped by Nico Hauwert using a combination of mapping surface divides using a Trimble GeoExplorer (accurate within 1 meter or 3 feet horizontally and vertically when postprocessed) and two feet contour interval coverage (Figure 1). While no discrete channels divert flow to the entrance and the source is largely upslope sheet flow, a slight depression has developed within 50 feet of the entrance that serves to focus runoff to the entrance, as an immaturely-developed internal drainage basin. On May 12, 2011 Mark

Sanders and Nico Hauwert directly observed a stream of water enter the cave during a brief but intense flash flood.

On June 9, 2011, the cave entrance and the surface divide for the catchment area near the cave was located using a Trimble GeoExplorer Global positioning Unit (GPS) with a horizontal and vertical accuracy within 1 meter (3 ft). The cave entrance hasp coordinates are 3094264, 10115925, with gps elevation 972+0.9 ft msl or 2 ft contour interval coverage estimates elevation of 975 ft msl. The two-foot interval contours were primarily used to estimate the uphill catchment area. The natural surface catchment area appears to be dissected by the subdivision and roads to the northeast.

Cave Mapping

Jester Estates Cave was mapped on October 30, 2006 by Peter Sprouse, Kathleen O'Connor, and Vickie Siegel of Zara Environmental LLC. It was remapped on June 9, 2011 by Nico Hauwert and Mark Sanders in order to map cave geology, drips, and faunal survey locations. Survey data collected in 2006 was incorporated into the 2011 map. The cave entrance is a round 2-3 ft diameter round shaft descending 11 ft into a further descending solution enlarged fissure dipping about 60 degrees. Much of the fissure and ceiling of laterally extensive bedding plane has extensively honeycombed burrowed beds. Just above the ceiling of the lower cave bedding plane, one honeycombed bed is particularly water bearing and distributes drips across the whole roughly 50 feet lower cave extent, although some areas drip more than others. One drip near the entrance fissure where Mark placed a bottle on May 24 produced only 50 ml/16 days. Mud-cracks were observed in mud cave floor between pools of water. The passage to the back room of the bedding plane is very muddy and tight, having a right angle turn.

Water Sampling

On June 9, 2011, a water sample was collected from a mud pool below D1 drip and bottle placed by Mark on May 24. This sampling was intended as a test case to see if tap water sources can be chemically distinguished away from their source. The chemical results have not yet been compared to other type samples collected, such as sample tap waters and other cave drips. About 0.6 liter of turbid sample was collected, enough for field parameters, total chlorine, major ions, metals, sr isotope, and oxygen/deuterium isotope analysis. I filtered all but the metals and field parameters. The total chlorine sample turned slightly pink with reagent and read 0.04 mg/l in slightly turbid sample (a filtered retest the next day read 0.15 mg/l and 0.13 mg/l at 4/5 min that I assume was an error. A retest read 0.03 mg/l). Specific conductance read 196 uS/cm when tested outside the cave. The turbidity may have caused the initial ph reading of 8.0, which declined to 7.36 at 273 NTU, stabilizing at 7.59 pH. The pink total chloride reading, the 196 uS/cm Sp cond, and persistent drip so far in a drought all suggest a tap water source.

A large plastic pan was installed under the D1 drip area for collecting future samples and volumetrically measuring net drip rate over a larger area, along with a continuous drip gauge under an individual drip.

Local Geology

The underlying contact of the Dolomitic Member of the Edwards Formation and underlying Cedar Park Member of the Walnut Fm is marked by a distinctive massive wackstone of clear to grainy matrix containing abundant caprinid and toucasia. This bed is the lowermost bed of the Dolomitic Member of the Edwards Formation. As a massive resistant bed, this bed typically is a cliff forming, is honeycombed from preferential dissolution of the rudist fossils. According to Mark Sanders this bed favors the rare plant, Canyon Mock Orange. In the Butler Preserve near Kiki Springs about 3,000 ft northwest of Jester Estates cave and along Jester estates Road about 6,000 feet south, the contact of the Dolomitic member and Cedar park lies between 905 to 910 feet msl. Since the base of Jester Estates Cave is mapped to an elevation of 945 ft msl, the Walnut Formation is anticipated to lie about 30 feet beneath the current cave extent.