## The Harvestman Transplant

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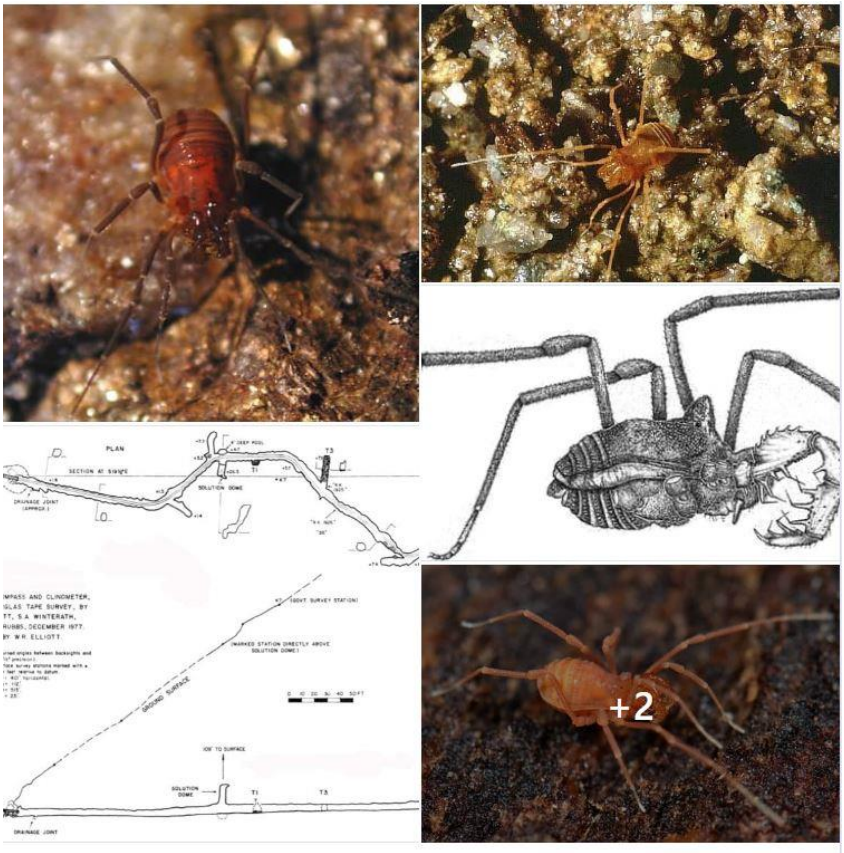
(***(1)*** etc. are removed names of specific locations, for confidentiality)

In the mid 1970's, New Melones Reservoir began filling, threatening a population of endangered harvester spiders within a cavern up stream of the dam. In December of 1971, Mr. Thomas Briggs, a systematist and field associate with the California Academy of Sciences informed the Army Corps of Engineers of the possible endearment status of fauna within ***(1)*** Cave that was currently undescribed at that time. Briggs requested efforts be made to preserve specific arthropods as well as other cave life that they would be dependent on. The primary target was known as banksula melones, also called the harvestman spider, genetically endemic to two of the affected and soon to be flooded caves. This specific spider is not found anywhere else in the world.

Further discussions with Briggs led to his suggestion that the harvestmen could probably be moved from ***(1)*** Cave to other nearby caves or mines which will not be affected by the new lake. In the New Melones Lake environmental statement of 1972, the Corps of Engineers made this statement: "Consideration is being given to relocating cave dwelling biological specimens that will be affected by the project to other caves."




In April of 1975, Briggs informed the Corps that ***(1)*** Cave might contain other species which have not been identified or described. He also stated the requirements for a relocation of the targeted cave life and associated fauna as follows: "a mine within limestone, moist year round, and it must have a constant temperature zone in total darkness." At approximately the same time, Briggs notified the Office of Endangered Species of the status of various cave fauna so that it might be studied for endangered species status.

Later in 1975, it was noted that the project for the reservoir would flood 30 caves along the river. Luckily in 1975, the Army Corps of Engineers sponsored a transplant of the affected cave fauna. The plan was to move the cave fauna from ***(1)*** Cave to a 50 year old abandoned mine nearby, nicknamed the "***(2)*** Mine." Thomas Briggs was put at the head of the operation. The mine was to be fitted with tubular steel as well as with a pad locked lid. The mine is on Bureau of Land Management land and has been barred from the possibility of having a mining claim put on it.

Six transplant operations were performed between July 19 and November 2, 1975. Approximately 142 man hours were spent in the field, with each transplant requiring two days. About 100 pounds of soil, rock and roots were, transplanted from the cave to the mine in styrofoam containers to minimize temperature and humidity changes. The live specimens were placed in vials containing moist soil and leaf litter. A constant temperature of 61°F and 100% relative humidity were monitored throughout the study at the collection sites. The specific collection sites were 80' from the cave entrance.

Specimens were placed 211' from the entrance of the ***(2)*** Mine within a 6' diameter study zone. On a return trip to the site on November 23, 1975, it was identified that only one species remained of the original 26 that were moved within the 6' study zone, while the rest were not found.

Unfortunately and unbeknownst to Briggs and the Corps of Engineers, a mining claim had been filed on the ***(2)*** Mine on October 30, 1976. Upon later inspection of the site, Briggs furiously reported that, "The site was found to have been disturbed, partly by miners who entered earlier in the year and drilled nearby and partly by a skunk which was observed in the mine. Wood scraps and sticks had been moved off the transplant soil. In spite of the drought, the inner wall of the site was moist. Drought conditions, however, may account for less life being observed. Wood scrap was replaced on the site."

Briggs soon concluded that the site was badly damaged by mining activity and the result caused exposure to drying conditions. He recommended that additional and larger transplants be made. Presumably, the claimants were persuaded to drop their claim on the mine. Uncertain of the first transplant and due to mining damage, the Army Corps of Engineers then conducted sponsorship for a second transplant in the winter of 1977 to 1978. The primary target was banksula melones yet again. Other species were moved as well as more banksula melones members. 27 of 35 identified species in ***(1)*** Cave were relocated to the ***(2)*** Mine successfully. A population total of 1,355 cave fauna were relocated. Despite painstaking collection efforts, the harvestman spider specifically only had 26 adults and 26 juveniles in total captured and moved successfully to their new permanent home approximately a mile and a half away.

The estimated flooding of ***(1)*** Cave was projected to occur in early 1979, so this really limited proper testing time to see if the second transplant was successful in the long term. Of

the 35 species in the affected cave, many were arthropods, and of those, some have yet to be scientifically identified or classified by systematists.

Due to the transplant and relocation of the banksula melones, a new species of spider has been identified in the ***(2)*** Mine by the name of collembola. Some how, this new species managed to work its way east into ***(3)*** Cave. Later trips to the mine and cave took place in late 1978, but due to access conditions being challenging, many days were lost in the effort to gain access to the mine and cave. For example, tire chains were required for traction in the steep terrain, with some grades measuring up to 34%.

Another example of lost time was the frequent flooding of the South Fork of the Stanislaus River. The river crossing at ***(1)*** Cave is normally 1’ or 2’ deep, but it was frequently too deep and swift to ford safely by truck or on foot. This problem was partially overcome by rigging a 150’ steel cable between large trees and doing a manual traverse above the river by means of hauling ropes, seat slings and a large pulley. Heavy containers of cave soil and fauna often had to be transported in this way. However, an extra 45 minutes or more was spent in rigging up and traversing on each trip to the cave.

In addition to weather problems, it soon became clear that the trails to the cave and the mine were far from safe for personnel, especially when wet and when they were carrying heavy loads. A new trail had to be constructed by hand to get safely from the river to ***(1)*** Cave. The trail from the mine road required much manual labor to make it safe and negotiable. Altogether, about 3 days of work were lost in constructing trails to the mine alone.
Another unforeseen problem was the flooding of the ***(2)*** Mine from within. Until the heavy rains which began about mid-December, the mine contained little to no free water and the walls were quite dry. Relative humidity ranged from 80% just inside the gate, to 90% at the study zone, to 99% at the end of the mine. By January 10, 1979, the mine was becoming wet and by January 17, it was seeping considerable amounts of water even at the end. With time, the mine had become progressively wetter from the entrance toward the end, as one advances under greater overburden. By January 18, a 9” deep pool had formed in the first straight section of the mine, being fed by continual sheet flow along the floor toward the entrance. A siphon hose was installed to attempt to drain the pool. After 24 hours of siphoning, roughly 1,339 gallons of water had been removed with no change in water level, therefor, the pool was being filled at the same rate that it was being drained. Luckily a small ditch was added inside of the mine to allow water to drain.

In late 1979, and to great joy, multiple banksula melones specimens were seen inside of the mine. The ***(2)*** Mine has a true horizontal length of 513’ and a vertical relief of about 25’. The mine slopes upward slightly from the entrance and seepage water runs along the floor toward the entrance where it pools and exits through a natural joint in the west wall. Apparently most of the mine was excavated as a quartz gold mine in the 1920's, according to a personal communication from Mr. Al Ponce of Sonora, whose boyhood home was in ***(4)*** Gulch near the mine. The initials "R .K ." are engraved on the wall in two places, along with the dates 1925 and 1926.

In the 50 to 55 years of the mine's existence there has been considerable calcite deposition such that parts of the mine resemble a cave. Ore cart rails are still in place but are encrusted with flowstone throughout the mine. The floor of the main tunnel has accumulated several inches of flowstone. Many pisolites, also known as cave pearls, are nested in floor pockets in several places. Small rimstone dams of translucent calcite have formed along the wall in several places. The walls and ceiling are decorated with short tubular stalactites and thin draperies. Since it seems possible to obtain an accurate date on the mine, these deposits could be of research value to speleological mineralogists interested in calcite deposition rates. The mine tunnel intersects what appears to be a natural solution dome, at the highest point in the mine. The last known record of banksula melones was recorded as stable within the ***(2)*** Mine. Wood, fungus, and microarthropods provided exceptional food sources for the harvester. The banksula melones population has spread to survive throughout the entire mine. The ***(2)*** Mine is still quite vulnerable to those who would stake mining claims and attempt to work the mine. There has been no known studies recently to see if banksula melones still thrives. Efforts will be taken soon, though.