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Inventory for *Oreohelix florida*, a New Mexico Endemic Landsnail
Progress Report

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Introduction

The New Mexico endemic Florida Mountainsnail, *Oreohelix florida*, is a State endangered species known as a fossil from four small, arid "sky island" mountains in southern New Mexico. It is named after the type locality in the Florida Mountains, just southeast of the town of Deming in Luna County. Noted malacologist H. A. Pilsbry discovered its shells there in the 1930's at what he called "central peak", which is probably what is today known as Baldy Peak, a massive limestone outcrop in the center of the mountain range. Pilsbry considered that *Oreohelix florida* could be extant elsewhere in the Florida Mountains, but possibly extinct at Baldy Peak.

With a few exceptions, most of the snails in the genus *Oreohelix* are calciphilic, inhabiting limestone talus, where calcium is available for shell production and growth. Inside a talus slope, landsnails can regulate their temperature and the amount of exposure received by changing the depth at which they aestivate or forage. The talus is a unique microhabitat, which accumulates leaf litter (often from oak trees on the periphery) and other detritus, upon which the snails will forage. Rains are of great importance because they cool off the surface of the talus, allowing the snails to emerge and begin foraging. It is not uncommon to witness great numbers of snails out foraging immediately after a rainstorm. Thus, it was crucial that our survey efforts were focused in limestone talus during or immediately following a rain event.

Methods

At each limestone talus slope, the surveyors documented the location with a global positioning system, noted the canyon, date, time, slope, aspect and dominant vegetation. The ambient temperature and the amount of precipitation received within the days prior the survey was also recorded. The two surveyors split the talus into halves, as to not overlap search efforts. As each surveyor came to a suitable habitat area, defined as having enough soil and litter accumulation around limestone rocks, the % rock, % soil, and % litter was recorded within a 1m wide by 2m long rectangle. (1m x 2m is typically enough space to survey within 5 min.)

A point number and start time was recorded before the surveyor began turning over rocks and looking for snails. Rocks of small to moderate size were turned over and picked up as each side was examined for the presence of foraging or aestivating snails. Larger rocks were merely rolled over, as they could not be lifted. Each observer surveyed 5 minutes at each of their respective plots.

The time elapsed from the beginning of the survey to the discovery of the first shell and the first live individual was recorded. Surveyors continued turning deeper rocks within the 1m x 2m rectangular plot for 5 minutes. At the end of the survey, the size of the rocks, litter composition, and level of soil moisture encountered within the plot was noted. Three values were taken to determine the variation of rock size within the plot. All measurements were estimates of the diameter of the rocks in centimeters or in meters: 1) the diameter of the smallest rocks in the plot (e.g. 1 centimeter in diameter), 2) the diameter of the average-sized rocks (e.g. 15 cm diameter), and 3) the size of the largest rocks in the plot (e.g. .75 m diameter). Soil moisture level measurements were somewhat subjective; we used the categories "low", "moderate", and "high." The soil was picked up in the hands and compressed together in the palms. If the soil retained its compressed shape in an open palm then the moisture was described as "high." When the compressed soil broke down into smaller clumps in the palm of the hand, not retaining its squeezed form, the moisture level was described as "moderate." If the soil moisture was comparatively "low" or "dry," it could not be compacted in the hands.

One of the two surveyors used a hygrometer to determine the percent relative humidity, dew point, and temperature within the soil. While turning rocks within a plot, the surveyor recorded the %RH and temperature of the soil (the dew point can be inferred from a scale on the back of the unit) as shells and live snails were found.

Photo points were usually taken from the opposite side of the canyon or a better vantage point enabling viewers to see the majority, if not all, of the talus slope surveyed. As a suitable vantage point was found, a rebar was hammered into the substrate where the photographer stood to take the picture. The bearing of the camera towards the direction of the talus slope was determined with a compass. The roll #, picture #, and set focal length (e.g. 35-70 mm) used in taking the picture was noted. Surveyors took a GPS position of the rebar location, recorded the name and location of the talus slope photographed, and described the distance and bearing to obvious landmarks near the photo point. All photos were taken with Kodak Elite 400 slide film by a Minolta camera.

Overall Findings

Prior to the surveys, the investigator obtained a collection permit from the NM Department of Game & Fish and surface geology maps of the Florida and Tres Hermanas Mountains to target limestone formations, where this snail is thought to be an obligate. On the evening of July 30, 1997, a rainstorm lasted over two hours in the Florida Mountains. Early the next morning, two surveyors hiked to the mesic habitat at the base of Baldy Peak, a massive limestone outcrop. A total of 22 points were surveyed around the base of Baldy Peak. No live or fossil *Oreohelix* individuals were found. However, two other endemic landsnails,

Ashmunella walkeri (G1) and *Sonorella hachitana* (G1), were out foraging in great numbers. This was pleasing, not only to incorporate their occurrence records into the New Mexico Natural Heritage Program's Biological Conservation Database, but also to confirm that the survey was done at an ideal time (with enough moisture present in the soil to activate aestivating snails).

The only fossilized shell of *Oreohelix florida* found at Baldy Peak was not discovered at one of the 22 survey points. Surveyors were investigating a large limestone boulder with many embedded fossils at the base of Baldy Peak, when one surveyor discovered the fossilized *Oreohelix florida* shell under the boulder. The surveyors then completed several sample points in this location, but no other shells were found.

On August 1, 1997, the surveyors hiked to another site adjacent to Baldy Peak where there was much limestone deposition, but less mesic habitat. Due to the arid southwest-facing exposure, and the lack of rainfall the previous evening, this site was considerably drier than the first. In fact, only a few live *Sonorella hachitana* and no *Ashmunella walkeri* were encountered on the approach to the site. A total of 6 points were surveyed, with no live snails of any species found in the survey plots. Similar to the first site, only one fossilized shell of *Oreohelix florida* was discovered here, but it was found enroute between survey points, not during a survey. As there was no rainfall forecasted for the following days, the surveyors abandoned the efforts the evening of August 1, 1997.

Surveyors made an additional trip to the Florida Mountains on August 18, 1997, hoping to match the next survey attempt with another rain event that had been forecasted. Unfortunately, after experiencing no rainfall on August 19, and finding no other live snails foraging on limestone depositions in the xeric habitat around Gym Peak, the surveyors abandoned efforts once again.

Surveyors traveled to the University of Texas at El Paso to deposit the two fossilized *Oreohelix* shells with Dr. Art Metcalf, who has amassed the largest collection of landsnails in the southwest. Upon returning to Albuquerque, the surveyors noticed large thunderhead cloud formations congregating around the Florida Mountains, and made one last effort to camp, awaiting the rains. On August 23, 1997, the surveyors returned home with no rain events having occurred. No sites in the Tres Hermanas Mountains were surveyed due to the unfavorable weather conditions and apparent small amount of limestone habitat shown on the geology maps.

It is the New Mexico Natural Heritage Program's opinion that *Oreohelix florida* is in fact extinct in the Florida Mountains. The first survey site at Baldy Peak was not only surveyed in ideal conditions, with enough moisture present to activate landsnails, but is the only site in the Florida Mountains harboring enough mesic habitat to potentially support a relic population of *Oreohelix florida*. A future survey at that mountain is not recommended.

Partnerships

The two fossilized shells were deposited in the Invertebrate Collection at the University of Texas at El Paso with Dr. Art Metcalf, who confirmed their identification and added them to the collection as specimen # 13,725. In addition, the rancher who has the public grazing allotment for the Florida Mountains kindly gave us directions to the easiest access to them.

Next Steps

Additional surveys should be conducted during ideal conditions in potential habitat on the other three mountains where fossil shells of *Oreohelix florida* exist before the global rank is changed to extinct (GX).

Budget

Salary	\$554
Benefits	\$196
Professional Fees	\$2245
Travel	\$676
Supplies and Communication	\$144
Total	\$3815

Communications

Because this species has not been found alive, it is doubtful that this investigation would hold much general public interest and media appeal. However, a media communication on the numerous globally imperiled talus slope landsnails that exist on small “sky island” mountains as relicts of the more moist Pleistocene epoch could have substantial media appeal. We have no video tape or art, other than drawings of this species, however, photographs were taken of the Baldy Peak survey sites.