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*Oreohelix eurekensis uinta* Brooks, 1939 (Stylommatophora:  
Oreohelicidae)**

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OREOHELICES OF UTAH, I. REDISCOVERY OF THE UINTA MOUNTAINSNAIL, *OREOHELIX EUREKENSIS UINTA* BROOKS, 1939 (STYLOMMATOPHORA: OREOHELICIDAE)

George V. Oliver<sup>1</sup> and William R. Bosworth III<sup>1</sup>

ABSTRACT.—*Oreohelix eurekensis uinta* had not been found since its original discovery and had never been reported as a living taxon, and this had led to speculation that it is extinct. However, searches for *O. e. uinta* had been confounded by multiple errors in the original definition of the type locality. The type locality has now been relocated and is here redefined, and *O. e. uinta* is reported for the 1st time as a living taxon. Although the holotype has been lost, existing specimens believed to be paratypes have been examined, and correction of errors in the literature concerning its size and proportions is provided. *O. e. uinta* has been detected only in a surprisingly small area (~0.03 ha) where potential threats to its continued existence are evident.

*Key words:* Oreohelix eurekensis uinta, Uinta mountainsnail, mollusks, gastropods, Utah, Uinta Mountains.

The Uinta mountainsnail, *Oreohelix eurekensis uinta*, was described by Brooks (1939) based on material collected at a single locality in northeastern Utah in the 1930s by E.R. Eller, but this taxon had not been found since its original discovery. Although searches for this taxon were conducted in 1992 (Clarke 1993, Clarke and Hovingh 1994), the type locality could not be relocated and the snail was not found. Clarke and Hovingh (1994) reported that vegetation in the area they thought to be the type locality of *O. e. uinta* had “been recently destroyed by fire with the object of improving grass cover for sheep” and commented that this “[b]urning of vegetation may have extirpated the snail population and this subspecies may be extinct.”

No attempts to relocate *O. e. uinta* other than that of Clarke and Hovingh (1994) have been reported. Clarke and Hovingh (1994) asserted that “[d]uring a comprehensive molluscan survey of the Uinta Mountains in 1939–1941 by Woolstenhulme (1942) no specimens of this subspecies were found.” However, Woolstenhulme’s (1942) work was, as stated by its author, a preliminary rather than comprehensive report and, despite its misleading title, largely does not pertain to the Uinta Mountains but deals mainly with the Wasatch Mountains to the west and non-mountainous areas both south and north of the Uinta Mountains.

Woolstenhulme’s (1942) report, in fact, provides very few records from localities actually within the Uinta Mountains.

In reviewing the scant literature (Brooks 1939, Pilsbry 1939) pertaining to *O. e. uinta*, we became convinced that, since the time of its description, no adequate effort had been made to find this taxon and speculation regarding its extinction (Clarke and Hovingh 1994) was premature, despite the fact that no living examples had been reported. Our goals, then, were to relocate the type locality with the objective of finding at least dead material (shells) and to search for living representatives of *O. e. uinta*, as well as to clarify and to expand, as much as possible, knowledge of this taxon.

#### METHODS

In the type description of *O. e. uinta*, Brooks (1939) stated the type locality as “on Hominy Creek, R. 1 W., T. 3 S., 3 miles north Uinta Special Meridian, near Whiterocks, Uinta Co., Utah.” There are, however, several errors in this locality statement. Although the spelling of Uintah County used by Brooks (1939) is incorrect, this is a commonly encountered error resulting from confusion with the spelling of the Uinta Mountains and one that does not impede understanding. However,

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since the Uintah Special Meridian (also misspelled by Brooks [1939]) runs north and south, not east and west, the phrase “3 miles north Uinta Special Meridian” is nonsensical. Furthermore, “T. 3 S.” is grossly incorrect, producing a locality far to the south of Hominy Creek.

While Clarke and Hovingh (1994) failed to note any of these errors in Brooks’ (1939) statement of the type locality, they did claim, incorrectly: “The name Hominy Creek does not appear on topographic maps.” The name Hominy Creek indeed does appear on 2 USGS 7.5-minute topographic maps, Ice Cave Peak, Utah (1965) and Pole Creek Cave, Utah (1965), and it also appears, misspelled as “Hominy Creek,” on the USGS 30 × 60-minute topographic map Dutch John, Utah-Colo.-Wyo. (1981).

Solutions to problems created by errors in the type description came from the discovery that Hominy Creek exists—and is mapped—and is not an older name for some other water body such as the Whiterocks River as Clarke and Hovingh (1994) believed. From this came the realization that the township designation “R. 1 W., T. 3 S.,” although wrong, is not completely inexplicable: R1W having been correctly derived from the Uintah Special Meridian and T3S having been incorrectly derived from the Salt Lake Meridian. Furthermore, if “3 miles west” of the Uintah Special Meridian is substituted for the nonsensical “3 miles north,” a reasonable locality is produced.

Corroboration of these conclusions came from the further discovery of an earlier publication by Brooks. Three years before publication of the type description, Brooks (1936) had announced the find of an undescribed *Oreohelix*, which at that time he referred to as a new species rather than a new subspecies, reportedly collected in 1935 rather than 1933 as he wrote later in the type description (Brooks 1939), and stated the locality of its collection as “Hominy Creek near Whiterocks, R. 1 W, T. 2 N, Uinta [*sic*] Special Meridian.” Although not a very precise locality, it is not, except for the minor error in spelling, erroneous or self-contradicting, and of particular importance is the correctly designated township: R1W, T2N, Uintah Special Meridian.

Guided by this earlier locality designation (Brooks 1936) combined with the necessary corrections to the locality stated in the type

description (Brooks 1939), in July 1998 we went to Hominy Creek, where we searched for *O. e. uinta* at 13 locations along the length of the creek, from near its source in Duchesne County to its mouth, the confluence of Hominy Creek and Farm Creek, in Uintah County.

## RESULTS AND DISCUSSION

At one of the 13 collecting stations along Hominy Creek, we were successful in finding *O. e. uinta*, of which we collected 84 dead shells as well as 3 live individuals on 10 July 1998, and we have compared these new specimens with Brooks’ specimens from the type locality.

### Type Specimens

In the type description of *O. e. uinta*, Brooks (1939) wrote: “Type in coll. Carnegie Mus., paratype in coll. Acad. Nat. Sci., Philadelphia.” John E. Rawlins of the Carnegie Museum of Natural History (letter, 6 January 1999) advised us:

The holotype of that name [*Oreohelix eurekensis uinta* Brooks, 1939], although supposedly at the Carnegie Museum, could not be found despite three thorough searches that included all of our known material in the family. . . . Further, our records do not reveal a catalog or accession number for anything under that name. . . . I checked the records and correspondence files carefully, and there is no evidence that this primary type was borrowed . . . and not returned.

We examined the single lot of *O. e. uinta* that is in the collection of the Academy of Natural Sciences of Philadelphia, catalogue number 164004, which contains 9 specimens that evidently are Brooks’ paratypes, despite his use of the singular “paratype” (Brooks 1939). Labels associated with these 9 specimens match closely the collection data reported by Brooks (1939) in the type description, including all locality errors, and provide the exact date of collection, 21 June 1933, which had been variously reported by Brooks (1936, 1939) as 1935 and 1933. Of these 9 specimens, the smallest individual may have been alive at the time of collection, as evidenced by the epiphragm covering the aperture when we examined it, although Brooks (1936, 1939) made no mention of any live material. The other 8 specimens appear to have been dead when collected, most of them rather obviously so. The vial

containing the 9 specimens had been divided, using a plug of cotton, into 1 group of 3 specimens in the bottom and another group of 6 higher in the vial. The 3 specimens in the bottom are the largest of the series, and they match the 3 shells illustrated in Pilsbry's (1939) Figure 348. Clarke and Hovingh (1994) reproduced Pilsbry's (1939) photographs of these 3 specimens, which they referred to as the "holotype" even though Pilsbry (1939) did not identify them as being type material. The shell that agrees with the one figured by Pilsbry in ventral view (lower left, Figure 348 in Pilsbry 1939), in addition to having a chipped aperture that matches that of the figured ventral view, still had a foreign, seemingly unnatural substance—presumably glue or wax used to hold it in position for photographing—adhering to the spire when we examined it. The 2 other specimens also agree with Pilsbry's photographs in various details (e.g., a small "scar" in the margin of the shell shown in dorsal view).

Brooks' (1939) measurements of the holotype, "[h]eight 8 mm., diam. 4.2 mm.," cannot be correct for an individual of the species *O. eurekaensis*—or for any member of the genus *Oreohelix* in which "[t]he shell is . . . usually depressed but varying from discoidal to pyramidal . . ." as defined by the author of this genus (Pilsbry 1905, 1939). While accepting the diameter of the holotype reported by Brooks (1939), Clarke and Hovingh (1994) believed that 2 typographical characters had been omitted from Brooks' (1939) statement of height and suggested that the actual measurement of shell height intended by Brooks was "probably 2.8" mm. However, Clarke and Hovingh's (1994) correction of the measurements of the holotype of *O. e. uinta* would make it only a little more than half the size of typical *O. e. eurekaensis* (see Pilsbry 1939) and would assign to *O. e. uinta* proportions that are very different from those of *O. e. eurekaensis* (i.e., *O. e. uinta* would be proportionately much higher spired). The more parsimonious explanation concerning the problematical measurements of *O. e. uinta* reported in the type description is that they were merely transposed, Brooks' (1939) intention having been: height 4.2 mm, diameter 8 mm. Measurements of the presumed paratypes (ANSP 164004), particularly the 3 figured by Pilsbry (1939), confirm this.

We have deposited 10 of the newly collected topotypes of *O. e. uinta* in the malacological collection of the Academy of Natural Sciences of Philadelphia (ANSP 401983).

#### Type Locality

The site at which we relocated *O. e. uinta*, and which we propose as a redefinition of the type locality of this taxon, is:

Utah, Duchesne County, south slope of the Uinta Mountains, T2N, R1W, SE  $\frac{1}{4}$  of SE  $\frac{1}{4}$  of SE  $\frac{1}{4}$  of section 4 (Uintah Special Meridian); along Hominy Creek  $\frac{1}{4}$  km upstream from "The Hole"; 13.8 km N and 5.3 km W of Whiterocks; 2645 m elevation.

It should be noted that this redefinition places the type locality in Duchesne County, not Uintah County as stated in the type description (Brooks 1939). This locality is, however, only 1.4 km west of the Uintah County line, and we believe the collector of the type material, Eller, was actually in Duchesne County in 1933 when he collected the type material. Importantly, the locality is precisely 3.00 miles west of the Uintah Special Meridian, while the type description states, as discussed above, that the type locality is "3 miles north Uinta Special Meridian," which supports our *a priori* conclusion that "west" rather than "north" was meant by Brooks (1939).

We found *O. e. uinta* only in a remarkably small area. The 4 farthest outlying shells (all dead) defined a quadrangle about  $14 \times 18 \times 28 \times 19$  m—an area of approximately 342 m<sup>2</sup> (~0.03 ha). Of the 3 live individuals, 2 were under the same rock, only a few centimeters apart, and the other was under a rock about 7 m away. The area of greatest concentration of shells was probably less than 1/10th of the total area in which shells were detected. Habitat somewhat similar to that found to be inhabited by *O. e. uinta* covered an area estimated to be at least 1 ha in the immediate vicinity, but we were unable to detect the presence of *O. e. uinta* beyond the limits mentioned above.

#### Habitat

The site where we located *O. e. uinta* was a relatively open, 45°, south-southwest-facing slope of broken limestone and loam. The sparse plant cover of the small area inhabited by *O. e. uinta* was predominantly chokecherry (*Prunus virginiana*), rose (*Rosa* cf. *woodsii*),

serviceberry (*Amelanchier* cf. *alnifolia*), pine (*Pinus* sp.), Douglas-fir (*Pseudotsuga menziesii*), thistle (*Cirsium* sp.), and wax currant (*Ribes cereum*), although we identified 9 other species of forbs and 2 other species of shrubs that were also present. Quaking aspen (*Populus tremuloides*) and sagebrush (*Artemisia* sp.) were prominent plants of the surrounding parts of the same slope, but only seedlings of these 2 plants were present within the area occupied by *O. e. uinta*; this was, in fact, the only noticeable difference between the area inhabited by *O. e. uinta* and the surrounding, seemingly uninhabited, but similar, area.

#### Associated Gastropods

Although we found and collected many species of gastropods during the course of our search for *O. e. uinta* at the 13 collecting stations along Hominy Creek, which included a wide array of habitats, we found very few molluscan taxa in close association with *O. e. uinta* at the single station where it occurs. The most common of these snail associates of *O. e. uinta* was its much larger congener the Rocky Mountain snail, *Oreohelix strigosa*, a very widespread and abundant snail in Utah, of which we found 155 dead shells and 6 live individuals within the area occupied by *O. e. uinta*; that is, *O. strigosa* was approximately twice as numerous, by counts of both live and dead individuals, as *O. e. uinta* in the small area where *O. e. uinta* occurs. The association of these 2 oreohelices is very close indeed, for under the same small rock that 2 of the living *O. e. uinta* were found, there was a live *O. strigosa* only 7 cm from 1 of the live individuals of *O. e. uinta*.

The few other snails found in association with *O. e. uinta* were each represented by very few individuals (fewer than 10 each, mostly dead shells); they were the Rocky Mountain column (*Pupilla blandi*), the variable vertigo (*Vertigo gouldi*), a species of vallyonia (*Vallyonia* cf. *cyclophorella*), the forest disc (*Discus whitneyi*), the striate disc (*Discus shimekii*), the brown hive (*Euconulus fulvus*), the amber glass (*Nesovitrea electrina*), and the western glass-snail (*Vitrina pellucida*).

#### Conservational Considerations

Despite the fact that *O. e. uinta* had never been reported as extant, it was formerly a Category 2 candidate taxon, one

for which information now in possession of the [U.S. Fish and Wildlife] Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available (U.S. Fish and Wildlife Service 1994),

until Category 2 was eliminated by the U.S. Fish and Wildlife Service on 28 February 1996. It is designated a "species of special concern" on the state's Utah Sensitive Species List (Utah Division of Wildlife Resources 1998).

The site inhabited by *O. e. uinta* is within the Ashley National Forest. Despite the moderately high elevation of the locality, cattle were conspicuously present in the area, and there was ample evidence of their use of the site where we found *O. e. uinta*. Because the inhabited site is steep, dry, and highly erodible, trampling and grazing by cattle could be devastating to the habitat of the snails, if not to the snails themselves; furthermore, grazing in this area removes plant cover, adding to the destabilization of the slope, altering the immediate habitat, and removing important food sources for these snails.

Timber harvest is a potential threat to *O. e. uinta*. Even though the particular patch of habitat occupied by the snails is not covered by arborescent growth, the surrounding area is, there being large conifers along Hominy Creek only 18 m from the lower edge of the inhabited portion of the slope, as well as scattered aspens on much of the slope itself.

We have communicated with personnel of the U.S. Forest Service regarding the rediscovery of *O. e. uinta*, and they have expressed their interest in taking action to protect the site of its occurrence.

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