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EVIDENCE FOR THE HISTORICAL OCCURRENCE OF KLIPSPRINGER AND MOUNTAIN REEDBUCK ON KILIMANJARO: REPLY TO GRIMSHAW, CORDEIRO, AND FOLEY

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Grimshaw, Cordeiro, and Foley (1995) have published an updated summary of the mammals on Kilimanjaro. In this useful review, they provide a revised account of mammalian extinctions on Kilimanjaro that differs from the conclusions reached earlier (Newmark *et al.*, 1991; Newmark, 1996). The authors conclude that the historical occurrence of klipspringer *Oreotragus oreotragus* on Kilimanjaro is questionable and that mountain reedbuck *Redunca fulvorufula* was not found historically on the mountain. In contrast to their conclusions, I find evidence for the historical presence of both species overwhelming and present this evidence below. I also conclude that both species are currently locally extinct within Kilimanjaro National Park.

Both the historical and current occurrence of any species can only be documented unequivocally through the presence of a specimen. However due to ethical, legal, methodological, and storage constraints, workers are frequently unable to collect and deposit in curated museum collections many species, such as large mammals occurring in protected areas. Researchers are thus required, in many circumstances, to document the status of species through sightings as we (Newmark *et al.*, 1991) and more recently Grimshaw *et al.* (1995) have done in verifying the current status of virtually all large mammal species found within Kilimanjaro National Park/Forest Reserve/Game Reserve.

Establishing the "validity" of earlier sighting records is a challenge for any scientist. This is especially true if all workers agree that a species does not currently occur in an area but for which there are published sightings in the past. I suggest that there are three important lines of evidence that can be used to interpret the "validity" of a sighting. These are: (1) the professional experience of the observer(s); (2) the appropriateness of the habitat in which the species was sighted; and (3) the local distribution of the species in relationship to the location of the sighting. These three lines of evidence all support the historical presence of klipspringer and mountain reedbuck on Mount Kilimanjaro.

KLIPSPRINGER

There are three important published sightings for klipspringer on Kilimanjaro. The first record appears in Gillman (1923), who informed Moreau (1944) that F.J. Miller, a companion, made the identification. Gillman's description is as follows: "At about 3000 metres we passed a large herd of eland and two klipspringers. Boulder-strewn lavafields descend from what looks like a ridge on the right but is, in reality, the edge of the basis

platform above us." What is important about this sighting is that two individuals were seen, which is characteristic of this species, along with a description of appropriate habitat for klipspringer (see below).

The second recorded sighting was also made by F.J. Miller, 10 years later, and is included in a report he wrote for the Game Department (Miller, 1933). Miller was at the time of this second sighting an Honorary Game Ranger with the Tanganyika Game Department, a position he was awarded in 1931 because of his keen interest in wildlife (General Notice No. 495, 30 April 1931). He reports observing eland up to 16,000 feet and "a pair of duiker antelope were observed at 10,000 feet. They were greyish, with tufts on the frontal bone. Several pairs of klipspringer were seen up to 13,000 feet." It is clear, based on Miller's description that he was not confusing klipspringer with common duiker *Sylvicapra grimmia* (*contra* King, 1975). Additionally, as Grimshaw *et al.* (1995) point out Miller's second sighting describes pairs of animals which is highly characteristic of klipspringer (Dunbar & Dunbar, 1974; Kingdon, 1982; Smithers, 1983).

The third published account of klipspringer on Kilimanjaro was in Moreau (1944), who reported that Capt. M.S. Moore sighted a "single specimen at 12,500 feet." Capt. M.S. Moore was at the time of the sighting, one of the eight paid professional game rangers within the Game Department in Tanganyika and had 18 years of professional experience with the department. In 1944, he was appointed the director of the Game Department (Tanganyika Territory Staff List, March 1944). Thus, given Capt. Moore's extensive professional experience, it is virtually certain he correctly identified klipspringer.

The habitat above the montane forest on Mount Kilimanjaro where all the sightings were recorded is typical habitat for klipspringer. Grimshaw *et al.* (1995) question the validity of Miller's second sighting because they feel that the habitat is inappropriate. Unfortunately, their description of typical habitat for klipspringer as "rocks and kopjes with grass and patches of bush in between" is not entirely accurate. According to well known authorities, klipspringer habitat is described as simply "rocky habitat" (Smithers, 1983) or a "labyrinth of rocks on steep, rocky and well-drained hillsides, escarpments or valley or open screes of loose pebbles or cinders" (Kingdon, 1982). Contrary to suggestions by Grimshaw *et al.* (1995) that klipspringer require bush in between rocks, Dunbar & Dunbar (1974) found, in the only study of which I am aware to quantify klipspringer habitat in East Africa, that the percentage of ground cover in combination with rocky terrain was a better predictor of klipspringer density than rocky terrain in combination with bush cover. Regardless of whether klipspringer habitat is described as simply "rocky " or "rocks and kopjes with grass and patches of bush in between" such habitat exists above the montane forest on Kilimanjaro.

Above the montane forest on Kilimanjaro, there are vast regions consisting of rock, scree, and lava flows. There are also numerous sites between the forest boundary and Mawenzi peak along the Marangu trail which are covered with boulders and lava flows, and interspersed with grass and bush. An example of such an area along the Marangu route is the Maundi Crater region (*personal observation*).

Additional evidence for the historical occurrence of klipspringer on Kilimanjaro comes from the local distribution of this species on surrounding mountains and hills. Klipspringer are found currently on Mount Meru, 40 km to the west of Kilimanjaro, at the same elevation at which Miller and Moore recorded their sightings of this species on Kilimanjaro (Newmark, *unpublished data*; Kingdon, 1982). This population most likely became established on Mount Meru by passing through the montane forest belt, contrary to suggestions by Grimshaw *et al.*

(1995) that klipspringer will not pass through forest. Alternatively this population could have become established during a period when the forest belt was incomplete as suggested by Grimshaw *et al.* (1995). Additionally klipspringer have been recorded from Amboseli National Park (Williams, 1981), 30 km to the northwest, the hills around Tinga Tinga, 15 km west (Grimshaw *et al.*, 1995), and the Pare Mountains, 30 km to the southeast (Swynnerton and Hayword, 1951).

Thus given the descriptions accompanying the sightings, the extensive professional experience of the observers, the suitability of extensive areas of habitat at the elevations where klipspringer have been sighted on Kilimanjaro, and the recorded occurrence of klipspringer on all mountains surrounding Kilimanjaro, the evidence for the historical presence of klipspringer on Kilimanjaro is overwhelming.

MOUNTAIN REEDBUCK

There are four useful published sightings of mountain reedbuck above the montane forest on Kilimanjaro and one recent published account immediately below the montane forest. The first two published sightings are tentative, and are described by Moreau (1944), one of the most distinguished ecologists to have worked in East Africa. He reported that "I saw several small antelopes, which I thought were Chanler's reedbuck, on the north side of the mountain above the forest, at 9,000 to 11,000 feet." Additionally, he states that Capt. M.S. Moore, who professional experience is described above, "thinks the one he saw at 9,000 feet belonged to this species....".

The third and one of the three more important records of mountain reedbuck on Kilimanjaro is by G.H. Swynnerton (1949) who at the time of the sighting was the preeminent mammalogist in Tanganyika and had 11 years of professional experience with the Game Department.

In a report he wrote on a biological expedition to the Shira Plateau, Swynnerton (1949) records the following: "Evidence of buffalo and elephant was seen at Camp 1, but they did not appear to reach the Plateau at any point. Bushbuck (a young male was shot at Camp 1), reedbuck (probably Chanler's), common duiker and eland occur all over the Plateau, the latter being noted up to at least 15,000 feet, on the lower slopes of Kibo. Leopard and serval droppings were common all over the Plateau up to about 12,500 feet, one serval being seen by Salt in the centre of the Plateau. Three common duikers were seen and a pair of horns picked up measured five and quarter inches in length ...".

Grimshaw *et al.* (1995) have questioned the validity of Swynnerton's record based upon comments by King (1975) who reviewed Swynnerton's personal diary. (Unfortunately, Swynnerton's diary is now missing from the College of African Wildlife Management library, and thus I was unable to review it). King reported (1975) that Swynnerton's diary indicated that one of his companions, either Dr. G. Salt of King's College, Cambridge, O. Milton, or B. Cooper, a professional game ranger (see below), observed the mountain reedbuck. Given Swynnerton's acknowledged professional competency, it is highly unlikely that he would have included mountain reedbuck as a resident species on the Shira plateau unless he had carefully questioned his companion. It is obvious that Swynnerton was convinced that mountain reedbuck occurred on the Shira Plateau because 2 years later he described mountain reedbuck

occurring on Kilimanjaro "up to 15,000 feet" in his checklist of mammals of Tanganyika (Swynnerton & Hayman, 1951).

The fourth record, and the second of the three more important accounts of mountain reedbuck on Kilimanjaro, is by Child (1965) who was a former Senior Game Ranger with the Tanganyika Game Department and instructor at the College of African Wildlife Management, Mweka. He reported that B. Cooper, a Senior Game Ranger with over 13 years of professional experience with the Game Department (Tanganyika Staff List, January 1958), reported seeing mountain reedbuck as well as common duiker and eland *Taurotragus oryx* on the Shira Plateau. Given Cooper's extensive professional experience, it is virtually certain he correctly identified mountain reedbuck. Child (1965) also notes importantly that Cooper's observation confirms Swynnerton's earlier sighting of mountain reedbuck, common duiker, and eland on the Shira Plateau.

The fifth record, and the third of the three more important sightings of mountain reedbuck, and one which provides personally compelling evidence for the historical occurrence of this species on Kilimanjaro, is our (WDN, JMG, CAHF) earlier reported sighting (Newmark *et al.*, 1991) of mountain reedbuck between April and May 1990 on the Simba Farm at 1950 m approximately six kilometres to the west of Kilimanjaro National Park/Forest Reserve/Game Reserve boundary. If all earlier sightings of mountain reedbuck on Kilimanjaro are dismissed as "invalid" as King (1975) and Grimshaw *et al.* (1995) have suggested, our reported sighting of mountain reedbuck would be the first record for Kilimanjaro. This would truly be astonishing.

Additional evidence for the historical occurrence of mountain reedbuck on Mount Kilimanjaro comes from the appropriateness of the habitat on the Shira Plateau for mountain reedbuck. Kingdon (1982) describes the preferred habitat of mountain reedbuck as "grassy mountain ridges from 1,500 m upwards, they also live in rocky broken country on small outcrops and on volcanic lava flows and cinder cones ...". Similarly, Smithers (1983) describes mountain reedbuck habitat as "dry, grass covered, stony slopes of hills and mountains where these provide cover in the form of bushes or scattered trees." Furthermore, Irby (1979) describes mountain reedbuck habitat as "escarpments, cinder cones, and lava flows."

The Shira Plateau is quite rocky and contains numerous lava flows. The vegetation on the plateau is a combination of grasses, sedges, and various shrub associations (Salt, 1954; Hedberg, 1995). Thus the habitat on the Shira Plateau is clearly appropriate for mountain reedbuck. Additionally, mountain reedbuck is known to occur above the montane forest belt in *Themeda* grasslands at elevations upwards of 2200 m in the Drakensbergs Mountains in South Africa (Rowe-Rowe, 1983).

Mountain reedbuck could have easily reached the Shira Plateau using the grassy glades on the western side of Kilimanjaro as a movement corridor between lowland and highland regions on Kilimanjaro. These glades are thought to have been maintained in the past by fires lit by pastoralists (Wood, 1965) and extend on the western side of Kilimanjaro to within 600 m of the Shira Plateau (Lamprey *et al.*, 1991; Swedforest Consulting AB, 1988). Thus, for mountain reedbuck to have reached the Shira Plateau, individuals would have had to pass through approximately 500 m of "low density" open forest (Swedforest Consulting AB, 1988). Alternatively, mountain reedbuck could have reached the Shira Plateau during a period when the forest belt was incomplete or by traversing the forest belt.

Finally, the current local distribution of mountain reedbuck around Kilimanjaro provides further evidence for the historical occurrence of this species on Kilimanjaro. Records for mountain reedbuck exist from the Chyulu Hills in Kenya (Simon, 1962), 50 km to the north of Kilimanjaro, and from the hills immediately to the north of Mount Meru, located 40 km to the west of Kilimanjaro (*personal communication*, K. Kapanya).

Given the number of sightings, the extensive professional experience of the observers, the suitability of habitat, and the local distribution of mountain reedbuck around Kilimanjaro, the evidence for the historical presence of mountain reedbuck on Kilimanjaro is also overwhelming.

Both Grimshaw *et al.* (1995) and I agree that both klipspringer and mountain reedbuck do not currently occur within Kilimanjaro National Park/Forest Reserve/Game Reserve. I conclude, as reported earlier (Newmark *et al.*, 1991; Newmark, 1996) that klipspringer and mountain reedbuck are now locally extinct within this protected area.

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