Habitats and foraging of Hooded Wheatears *Oenanthe monacha* in Jordan

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Wheatears (genus *Oenanthe*) are the most characteristic insectivorous passerines in the deserts of the Middle East. A few studies have focused on the ecology including interspecific interactions and ecological segregation (Cornwallis 1975, Panov 2005, Kaboli *et al* 2007a,b) and phylogenetic relationships (Tye 1989, Aliabadian *et al* 2007) of a number of wheatear species. However, the Hooded Wheatear *Oenanthe monacha* remains one of the least known species within its genus as it is difficult to locate and observe for the following reasons: it has a discontinuous distribution and often occurs at low densities across its range, which extends from NE Africa to Pakistan. Secondly, it is usually restricted to inaccessible habitats of the desert, where it moves constantly over large distances across its huge territories (Panov 2005). The Hooded Wheatear's morphology stands out among other members of its genus in having a slimmer body, comparatively lower body mass, a longer tail, a longer beak and weaker feet, with short, slender tarsus and toes (Tye 1989, Plate 1). These morphological traits represent probably adaptations to catching flying insects (Cornwallis 1975, Panov 2005, Kaboli *et al* 2007b) and possibly to utilising large and structurally complex territories.

In Jordan, the Hooded Wheatear is a thinly distributed resident of arid rocky terrain in the lower parts of the rift margins, from the Wadi Mujib area south to the Aqaba mountains, and in the Rum desert (Andrews 1995). It is rare to uncommon along the lower rift margins *eg* at Mujib and Dana reserves (RSCN 1995, 2001), but appears to be more frequent at Wadi Rum (RSCN 2000). It has also been recorded in adjacent, low-lying flat areas, *eg* near the shores of Aqaba and the Dead Sea and in sandy/stony plains and dry salt marshes in Wadi Araba (Andrews 1995, Khoury pers obs).

We summarize observations on the Hooded Wheatear carried out in three territories in SW Jordan that shed some light on the little known aspects of habitat selection and usage in this species.

Plate 1. Female adult Hooded Wheatear *Oenanthe monacha*, trapped in August 2007, Wadi Rum. © *Marc Förschler*.

METHODS AND STUDY AREA

Direct observations were carried out at three territories after one or more birds were located and observed holding territory or lengthily feeding at a site. Foraging birds were followed and observed from a distance by the observers who covered an area of 2–3 km² per site. During an observation, a foraging bird was observed for periods ranging from 10 minutes to 1 hour. Habitat description was carried out in terms of topography, vegetation and distribution of rock-outcrops and boulders.

The first territory was in the low-lying rift margins of the Dana reserve and adjacent part of Wadi Araba (30°45'N, 35°15'E), at the mouth of Wadi Mhash (territory 1, Table 1) at an altitude of 50–100 m below sea level. The two other territories (territories 2 & 3) were located in the Wadi Rum reserve (29°35'N, 35°25'E) at an altitude of *c*1000 m asl. Territory 2 (Table 1) was located at Jebel Hubeila (Plate 2), near the entrance of the reserve, while territory 3 was close to Khazali (Plate 3; see RSCN 2000 for map). Both areas are hyper-arid

Table 1. Description of three feeding habitats of Hooded Wheatear in Jordan. + present, – absent.

	Territory 1 Mhash-Wadi Araba	Territory 2 Hubeila-Rum	Territory 3 Khazali-Rum
Number of birds	2 (pair)	3 (ad ♂, 2 imm)	2 (pair)
Date	12 May 1995	22–24 August 2007	25 August 2007
Plain	+	–	+
Broad wadi bed	+	+	–
Water runnels	–	+	–
Slope [°]	0–5	0–10	0–5
Rock cover [%]	10	15	1
Stone cover [%]	10	55	1
Gravel cover [%]	10	10	5
Sand cover [%]	70	20	93
Dwarf shrubs [%]	25	20 (patchy)	30
Shrubs [%]	5	1	1

desert with an average annual precipitation below 100 mm and average yearly temperatures of 22–24°C (National Atlas of Jordan 1984). They are characterized by a variety of habitats including rocky, steep slopes and mountains (sandstone, granite), as well as plains of flat sand dunes and/or broad wadi beds and stone-covered alluvial fans. The study areas lie within the botanical Sudanian penetration zone, and the vegetation of flat, sandy areas is dominated by the dwarf shrub *Hammada salicornica,* and the shrubs *Haloxylum persicum* and *Retama raetam* (Albert *et al* 2004).

RESULTS

Topography

The three territories studied were similar in topography, containing a combination of steep, barren, rocky hillsides containing cliffs, and flat plains and/or wide wadi beds (Plates 2 & 3). The steep areas and cliffs were used for nesting as indicated by birds carrying food in the first territory (Dana reserve), and for roosting as indicated by the daily activity of birds at the two other territories (Wadi Rum): after sunrise or before sunset, birds were seen leaving or heading to the steep, rocky hillsides and cliffs.

Feeding habitat and foraging behaviour

All feeding activity appeared to occur in flat areas (plains or wide wadi beds) adjacent to the steep hillsides and cliffs, which were covered mainly by sand or stones and contained a moderate cover of dwarf shrubs but no or very low cover of shrubs higher than 1 m (Table 1, Plates 2 & 3). In the five individuals observed in Wadi Rum, both ground foraging (perch and pounce) and aerial pursuits after flying insects were observed. Especially when foraging among dwarf shrubs, aerial pursuits were frequent and usually consisted of flying after grasshoppers close to the ground, during which the birds showed remarkable manoeuvrability and persistence. Vertical aerial pursuits to a height of up to 30 m were also observed several times. During the rapid flights around solitary small bushes, the birds often flushed their prey into the open space where they were easily taken by sudden sharp turns reminiscent of a swallow or bee-eater in flight. The individuals we observed while foraging at the two territories in Wadi Rum were virtually in constant motion, systematically searching an area by moving from one stone/small rock or dwarf shrub to the next, rarely perching at one point for longer than 20 seconds and rarely returning to the same perch. In one case a female also foraged by hopping over a longer distance along a small sandy water

Plate 2. Habitat of Hooded Wheatear, Jebel Hubeila, Wadi Rum reserve. © *Marc Förschler.*

Plate 3. Habitat of Hooded Wheatear, Khazali, Wadi Rum reserve. © *Marc Förschler.*

runnel in a wadi bed, scanning small bushes and gravel for grasshoppers and other prey. This behaviour was observed before sunset and was possibly linked to a decrease of active flying insects. Individuals sharing the same territory (Table 1) were widely spaced, *ie* feeding solitarily, keeping a distance of over 100 m between them. When disturbed by an observer or for other reasons the wheatears changed their foraging area by flying a considerable distance away. Each bird apparently covered an area of up to 1–2 km² per foraging session (morning or afternoon), with considerable overlap between individual feeding areas within the same territory.

Interspecific interactions

Each of the three territories overlapped with or included at least one territory of White-crowned Wheatear *O. leucopyga*, which were usually along piedmonts and on gentle slopes and rock boulders between the foot of a steep hillside or cliff and the adjacent plain or wadi bed. Encounters were rare, probably because Hooded Wheatears tended to over-fly piedmonts when moving between steep hillsides/cliffs and the feeding areas. On one occasion, in territory 2, the two species met along the flat bed of a wadi, close to the piedmont. The approach of a White-crowned Wheatear resulted directly in the retreat of the adult male Hooded Wheatear further into the broad wadi bed. Panov (2005) observed a Hooded Wheatear male that was challenged and then pursued by a territorial White-crowned Wheatear.

DISCUSSION

The extensive territories of Hooded Wheatear, which appear to be larger than 2 km² (as indicated by the area used by feeding birds only), combine rocky, steep hillsides and cliffs with sandy plains and/or broad river beds. Cliffs and rocky, steep hillsides are used for nesting and probably are important for thermoregulation as they offer extra shade during the hot hours around midday. The extensive flat areas are required for feeding as they usually contain higher densities of arthropods than the barren and unproductive hill sides (Cornwallis 1975). The view that Hooded Wheatears select the most barren deserts (Cornwallis 1975, Snow & Perrins 1998) due to exclusion from more vegetated habitats by other, more dominant, wheatear species could not be confirmed as the feeding sites in Jordan contained a moderate cover of dwarf shrubs. Piedmonts within the studied territories with more dominant species, particularly White-crowned Wheatear, appeared to be avoided by over-flying. Interspecific competition may have been a selective force leading to divergence in morphological and behavioural traits related to territory size and use (*cf* Kaboli *et al* 2007a,b), as well as food items and feeding techniques of the two species. According to Panov (2005), the Hooded Wheatear occupies the same ecological niche

among desert birds as bee-eaters, although it also obtains food on the ground. Furthermore, it seems to be more tolerant to hot conditions than the White-crowned Wheatear, apparently changing later to shady areas. In our study sites, they stayed in the sunny and hot wadi bed an extra hour or two during the late morning than other wheatears.

The Hooded Wheatear has a small range and is therefore of conservation importance (Evans 1994). The former view of this species as being restricted to inaccessible habitats, which are rarely affected by human development, may lead to a lack of conservation action. Although quantitative ecological data is still required, including seasonal variation, our observations suggest that the species needs extensive, flat feeding sites within its territory, which may experience destruction and degradation by man. Grasshoppers and other large insects such as butterflies and dragonflies play an important role in the species' diet (Panov 2005, pers obs) and may be affected by degradation of desert vegetation. One of the most positive developments in the Wadi Rum protected area, since its establishment in 1999, was the control of off-road driving and subsequent decrease in disturbance and the regeneration of the natural vegetation in the sandy wadis and plains adjacent to the sandstone mountains.

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