

Breeding birds of Hayl al Jawari area, Jebal Sarah, Jebal al Akhdar mountains, northern Oman

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The Hayl al Jawari area of Jebal Sarah, west of Jebal Shems ('J. Shams') in northern Oman is a reserve of the Diwan of Royal court of Oman. It is one of the best, if not the best, remaining example of highland habitat in northern Oman, with many stands of juniper, olive and other native trees. It has a number of breeding birds which are rare everywhere else in Arabia and some that perhaps only breed at that locality. I have visited the area on three occasions since 2008 but never in summer. I was intrigued to hear of the reports of Jens and Hanne Eriksen (Eriksen & Eriksen 2013) who visited the site in June and July and found several rare summer visitors which bred or almost certainly bred. To further investigate these species I had hoped to visit the reserve 26 April–30 May 2017 though I was absent 29 April–4 May. My objective was to examine which avian species breed in the reserve particularly in summer, assess their numbers, discover more of their ecology and identify any threats or conservation issues that they face. Migrant and visiting birds were also recorded as were other fauna. An extended PDF report of this survey is available on request from the author.

DESCRIPTION OF THE AREA, HABITATS AND WEATHER CONDITIONS DURING MAY

The underlying geology of this part of the western Jebal Al Akhdar is limestone, with only silty calcareous soils in shallow wadis and hollows. Typical of limestone districts there are a number of small caves and at least one sinkhole.

For the purposes of the study I divided the study area into three main parts: the lower plateau and southern hills 2200–2350 m, the upper plateau of Jebal Sarah 2450–2685 m and the escarpment which divides the two (Figures 1, 2). Within this area of c1600 ha I identified a number of sites (Figure 2) where tree cover and undergrowth were particularly dense and gave them special attention as they were likely good locations for many of the breeding birds.



Figure 1. Position of the Hayl al Jawari study area relative to the Jebal al Shems ('Jebel Shams') summit, Jebal al Akhdar mountains, northern Oman. Map based on Google Earth.

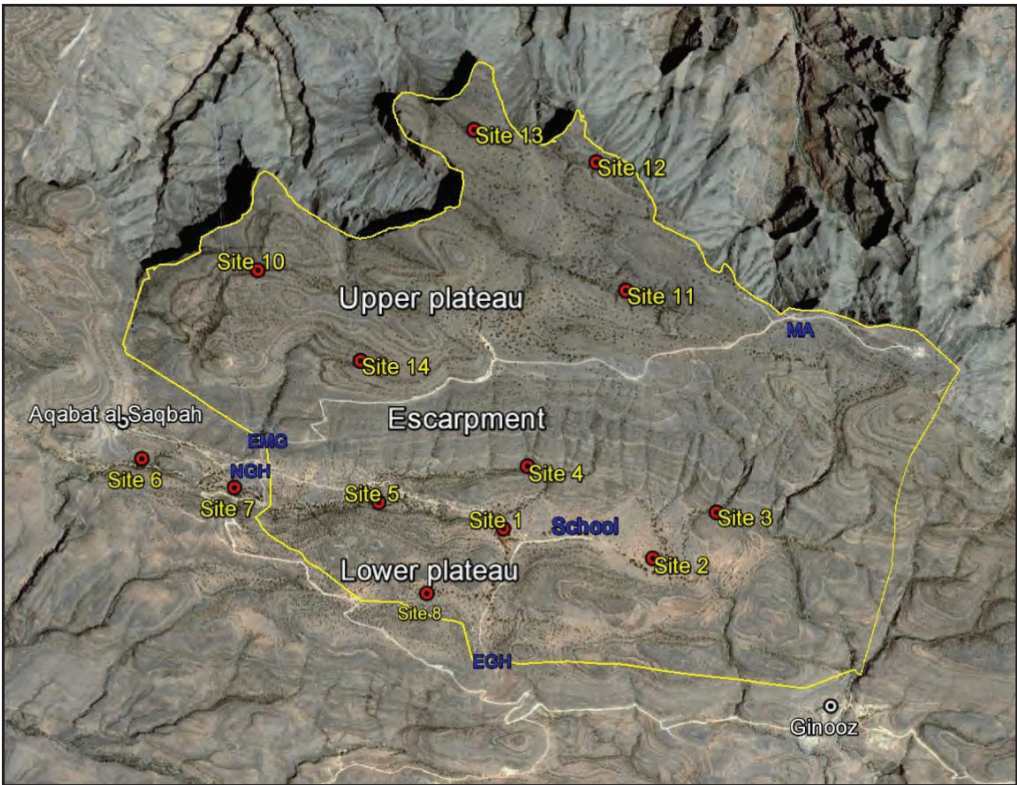


Figure 2. The Hayl al Jawari study area, Jebal al Akhdar mountains, northern Oman. Map based on Google Earth. Key: EGH = existing guard house, EMG = existing military gate, MA = Military area, NGH = Suggested new gate to serve both MA and the reserve.

The lower plateau is of generally uniform altitude, some 4.5 km long, west–east, and between 200–500 m wide, north–south. The eastern third drains to the east and the rest to the west. However there is an area of c20 ha which drains into a sink hole situated at 23° 18.351' N, 57° 07.374' E. To the south of the lower plateau the ground rises some 60 m as a low hill. The prominent vegetation of the lower plateau are many mature trees of juniper *Juniperus excelsa polycarpus*, olive *Olea europaea africana*, and buut *Reptonia mascatensis*. Smaller bushes present were nimpt *Sageretia thea*, *Zizyphus hajarensis*, Arabian buckthorn *Lycium shawii*, *Daphne mucronata*, a honeysuckle *Lonicera aucheri*, soapberry *Dodonaea viscosa*, a perennial daisy *Euryops arabicus*, aloe *Aloe vera/barbadense*, a climber *Clematis orientalis* and tussock grass *Cymbopogon jwarancusa*. A very few other grasses appeared after rain 12/13 May. By far the most vegetation was in the wadi ‘water courses’ where the dominant trees can form a canopy with a thick understory of bushes and other perennials (Plates 1, 2). The upper plateau is bordered on the south and west by the escarpment and the north and east by a continuous precipice, in places nearly 300 m high. Here there are many large specimens of juniper though olive and buut were much less in evidence. Here most of the junipers were in excellent condition although there was evidence of ancient wood cutting. The range of shrubs and bushes is similar to the lower plateau but most were not so frequent. Two small plants which were only seen on the upper plateau were the broom-like *Ephedra intermedia* and *Teucrium mascatense*. Both were probably eaten by herbivores on the lower plateau. The escarpment between the upper and lower plateaus, has a height of between c150 m in the west to almost 300 m in the east, it differs from the



Plate 1. Part of the lower plateau (site 2) showing juniper *Juniperus excelsa* and tussock grass *Cymbopogon schoenanthus*. The bushes include *Dodonaea viscosa*, *Sageretia thea*, *Daphne mucronata* and *Euryops pinifolius*. © Mike Jennings



Plate 2. The upper plateau (site 11) is dominated by junipers and tussock grass, there were only a few olive trees *Olea europaea*. © Mike Jennings



Plate 3. On the morning after the heavy hailstorm of 12/13 May, banks of hail were still present by wadis. © Mike Jennings

lower plateau in that there are few large trees of any species because the run off of water is much quicker and soil is very limited.

There are no permanent human habitations in the reserve area but there is a school in the middle of the lower plateau which provides education to children from the surrounding villages and accommodation for the teaching staff during term time (this school is due to be relocated). The reserve security guards have a building which is manned continuously on the southern boundary. On the upper plateau there is a military installation with an access track constructed in 2013 which includes accommodation for military staff.

Weather during the survey period was generally warm in the day in the range 20–24°C and about 10–15°C at night although on several days early morning temperatures fell below 10°C and the minimum was 4°C on 7 May. Daytime temperatures increased towards the end of May with 29°C on 29 May. Many days were at least partly cloudy for most of the day. There was significant rain causing the wadis to run c3 May (when I was absent). On 11 May it rained hard for a few minutes but did not cause the wadis to run. However on 12 May there was prolonged heavy rain from late afternoon, including much hail, to early morning 13 May. This caused all the wadis to run and cascades formed down the side of the escarpment. The hail washed down the wadis to form deep drifts where it settled (Plate 3).

ORNITHOLOGICAL HISTORY

Study of the birds of this part of Oman commenced with the pioneering work by Michael Gallagher and the Oman flora and fauna survey 1975 (Gallagher 1977). In that year in April a multi-disciplinary team of biologists crossed the western Jebal Al Akhdar, east of the Jebal Shems summit, and recorded for the first time several resident and breeding birds in the area. Since that time, and particularly following the opening of travel possibilities

within Oman in the early 1990s, a number of resident and visiting naturalists have recorded birds in the region and passed details to the Oman bird records committee database, maintained by Jens Eriksen, the Oman bird recorder. Jens passed me relevant information from the database for the purposes of my own survey. The reserve and Jebal Sarah were not accessible and reported on until 2008 when the pristine habitats and grandeur of the area were first published briefly (Jennings 2009). Jens and Hanne Eriksen made important observations at Hayl al Jawari in 2012 and 2013 (Eriksen & Eriksen 2013) when a number of interesting potential breeding species were present. These were Turkestan Shrike *Lanius phoenicuroides*, Eastern Olivaceous Warbler *Iduna pallida*, Eastern Orphean Warbler *Sylvia crassirostris*, Hume's Whitethroat *Sylvia althaea*, Isabelline Wheatear *Oenanthe isabellinus* and Common Rosefinch *Carpodacus erythrinus*.

OBSERVATIONS OF BREEDING BIRDS IN 2017

My own field work was concentrated on visiting the identified sites (Figure 2) as frequently as possible, this was best done on foot. Methods used included use of a sound recorder, photography (including a trail camera for night use). I had the use of a single 13 m mist net but that was unfortunately destroyed by torrential rain on first use. A number of early morning walked censuses were carried out to help assess numbers of common birds present. Table 1 presents a summary of the status of each breeding species and a population estimate. Of the likely 29 breeding species no less than nine are breeding seasonal visitors. Whilst the other species mainly breed late February–mid April the visitors mostly breed relatively late, end of May–July. It seems that late breeders are able to utilise a twofold food bounty provided by the fruiting of the buut tree *Reptonia mascatensis* and *Daphne mucronata* in June and July and secondly the bloom of invertebrates which would follow rain in May. Individual species notes follow.

Egyptian Vulture *Neophron percnopterus*. This Endangered species is a relatively common and widespread resident in Hayl al Jawari, recorded most days, up to 3 birds together. It was not confirmed nesting but there are probably of the order of up to three pairs breeding in the area.

Lappet-faced Vulture *Torgos tracheliotos*. This vulture is also classified as Endangered, one or two birds were observed on three days within the reserve. It was not confirmed to breed during the survey but it is a wide ranging, scarce breeding resident throughout northern Oman which has bred on nearby Jebal Shems.

Bonelli's Eagle *Aquila fasciata*. There is probably a breeding pair in or near to the reserve as it is regularly recorded in the area (OBRC), only one adult was seen to the southeast corner of the reserve on 5 May and another (probably this species) was seen Jebal Shems on 30 May.

Barbary Falcon *Falco pelegrinoides*. A single adult was disturbed from a precipice at c2550 m asl, on the upper plateau, near site 12 on 23 May. The bird was agitated and remained in the area from where I disturbed it until I left the vicinity; it probably was actively nesting at the time.

Arabian Partridge *Alectoris melanocephala*. Not seen on the lower plateau but heard from there calling high up on the escarpment and on the upper plateau. It was shy and difficult to approach on account of being a long term quarry species and is probably still hunted occasionally.

Table 1. Likely avian breeding species at Hayl al Jawari with status and estimated populations.

	Status	Estimated population (number of breeding pairs) Hayl al Jawari
Egyptian Vulture <i>Neophron percnopterus</i>	Uncommon breeding resident, seen most days	≤3
Lappet-faced Vulture <i>Torgos tracheliotos</i>	Rare breeding resident	≤1
Bonelli's Eagle <i>Aquila fasciata</i>	Rare resident probably breeds	≤1
Barbary Falcon <i>Falco pelegrinoides</i>	Rare breeding resident	1–2
Arabian Partridge <i>Alectoris melanocephala</i>	Common breeding resident	35
Grey Francolin <i>Francolinus pondicerianus</i>	Rare breeding resident	5
Rock Pigeon <i>Columba livia</i>	Common breeding resident	50
Common Wood Pigeon <i>Columba palumbus</i>	Common breeding resident	80
Laughing Dove <i>Spilopelia senegalensis</i>	Very common breeding resident	600
Pallid Scops Owl <i>Otus brucei</i>	Common breeding resident	180
Little Owl <i>Athene noctua</i>	Uncommon breeding resident	25
Pallid Swift <i>Apus pallidus</i>	Very common breeding visitor	750
Hoopoe <i>Upupa epops</i>	Probable scarce breeding visitor	Not applicable
Desert lark <i>Ammomanes deserti</i>	Uncommon breeding resident	30
Pale Crag Martin <i>Ptyonoprogne obsoleta</i>	Common breeding resident	40
Long-billed Pipit <i>Anthus similis</i>	Common breeding visitor	140
White-spectacled Bulbul <i>Pycnonotus xanthopygos</i>	Very common breeding resident	1100
Isabelline Wheatear <i>Oenanthe isabellinus</i>	Rare breeding visitor, may only breed at one other site in northern Oman	Insufficient information
Hooded Wheatear <i>Oenanthe monacha</i>	Rare breeding resident	3
Hume's Wheatear <i>Oenanthe albonigra</i>	Common breeding resident	275
Streaked Scrub Warbler <i>Scotocerca inquieta</i>	Common breeding resident	275
Eastern Olivaceous Warbler <i>Iduna pallida</i>	Rare visitor that might breed	Not applicable
Eastern Orphean Warbler <i>Sylvia crassirostris</i>	Uncommon breeding visitor, not confirmed breeding elsewhere in Oman	30
Hume's Whitethroat <i>Sylvia althaea</i>	Uncommon breeding visitor, not known to breed elsewhere in Oman	17
Arabian Babbler <i>Turdoides squamiceps</i>	Uncommon breeding resident	25
Turkestan Shrike <i>Lanius phoenicuroides</i>	Rare breeding visitor, only breeds in the highlands of northern Oman	3
Brown-necked Raven <i>Corvus ruficollis</i>	Uncommon breeding resident	Insufficient information
Common Rosefinch <i>Carpodacus erythrinus</i>	Likely rare breeding summer visitor, the only likely breeding site in Arabia	Insufficient information
Striolated Bunting <i>Emberiza striolata</i>	Uncommon breeding resident	Insufficient information

Grey Francolin *Francolinus pondicerianus*. A recent colonist of these highlands, first recorded at Hayl al Jawari in 2012 (OBRC) and is now resident. It occurs in small numbers on the lower plateau only, being heard much more often than seen. There are probably five or less breeding pairs.

Rock Pigeon *Columba livia*. Widespread resident of northern Oman but rather scarce and there were surprisingly few recorded in the reserve. An active breeding colony of c50 pairs was located at a cliff face cave on the upper plateau, near site 12 on 23 May. It was not seen elsewhere in the reserve. Feral pigeons occur at some local villages.

Common Wood Pigeon *Columba palumbus*. An uncommon but local breeding resident in the highlands of northern Oman, mainly above 2000 m. Seen or heard at all parts of the Hayl al Jawari reserve but not recorded everyday. Shy and difficult to approach due to a tradition of local hunting. Usually observations were limited to distant cooing of individuals especially in the early morning, occasionally 3–4 males could be heard cooing at the same time. It was more numerous on the upper plateau and escarpment. Not recorded foraging on the ground. The population is probably about one pair in each 10 ha, although only about half the reserve is suitable for it.

Laughing Dove *Spilopelia senegalensis*. Common breeding resident throughout the reserve, more numerous on the lower plateau. There is probably a pair in every 2 ha of the lower plateau and about a quarter of this density in other parts of Hayl al Jawari.

Pallid Scops Owl *Otus brucei*. A widespread resident and commonly calling at night on the lower plateau. They call, often for long periods, mostly from dusk and in the early evening but may call at any time in the night, before and at dawn. Apparently not predated or displaced by Little Owl *Athene noctua* which occurs in the same area and both species may be heard calling at the same time. Very numerous, there is probably at least one pair in every 5 ha of the lower plateau. The upper plateau was not visited at night but it is likely to be less numerous there.

Little Owl *Athene noctua*. A resident in rocky, scrub covered or lightly wooded hillsides and ravines, mainly on the lower plateau and the escarpment, but much less common than Pallid Scops Owl. The Upper Plateau was not visited at night but there is likely to be a small population there also.

Pallid Swift *Apus pallidus*. A common breeding visitor to Hayl al Jawari it was seen on most days but in very variable numbers, some days none, on other days several hundred might be feeding at head height for an hour or so over the lower plateau. Twice heard feeding at night (audible regular strong wing beats from low level passes). Not found to breed on the lower plateau however there were numerous colonies on or visible from the upper plateau. On 15 May many hundred were seen circling and entering cliff crevices c500 m to the north of the precipice at site 10, there were other active colonies at sites 11 and 12 later in the month. It may well be the most numerous breeding bird in the area.

Hoopoe *Upupa epops*. A migrant throughout Oman and a local breeding summer visitor to northern Oman. Not confirmed to breed at Hayl al Jawari but likely to. Only one observation of an adult on 23 May.

Desert Lark *Ammomanes deserti*. An uncommon sedentary resident that is increasingly less numerous with altitude, it is rare above 2000 m which accounts for the few records at

Hayl al Jawari (up to 2350 m). It was not seen on the upper plateau. Nest building was recorded but this probable late season breeding attempt was abandoned.

Pale Crag Martin *Ptyonoprogne obsoleta*. An uncommon breeding resident usually seen as singletons or pairs. No breeding activity was noted at the reserve but active nests were found in nearby areas.

Long-billed Pipit *Anthus similis*. A common resident which moves to lower altitudes when not breeding. Observed at all sites. Frequents tussock grass plains with light bush cover and open hillsides where it finds invertebrate prey. One bird observed feeding in tussock grass walked between tussocks searching tussock bases but mainly reached up to take prey on the top of tussocks. The species' long legs, neck and bill facilitate this behaviour but it would also jump to secure prey and climb onto tussocks to take prey it could not reach from the ground. Breeding was thought to be over but there was still plenty of song in May.

White-spectacled Bulbul *Pycnonotus xanthopygos*. A common resident, one of the most populous species, found throughout the reserve. It was assumed that most breeding of this species was complete by the end of April.

Isabelline Wheatear *Oenanthe isabellinus*. Mainly a migrant and winter visitor throughout Oman but an uncommon, perhaps erratic, breeding summer visitor above 2000 m. There are records of juveniles being seen at Hayl al Jawari on July 2012 and June 2013 (Eriksen & Eriksen 2013). A single bird was seen near the school throughout the day, 29 May.

Hooded Wheatear *Oenanthe monacha*. A rare resident in northern Oman, a single male was singing on the escarpment above site 3 on 11 May, another was seen on Jebal Shems.

Hume's Wheatear *Oenanthe albonigra*. A common resident throughout the reserve. Seen feeding by dropping onto invertebrates from a low perch and searching ground vegetation, it also pursues flying insects and takes berries. Commonly singing at Hayl al Jawari with pairs and territorial disputes frequent. A female was seen twice leaving a hole in an olive tree c1.5 m above ground level on 21 May, which on inspection proved to be a deep hole into the trunk but with no visible nest. When the site was examined again on 24 May the hole contained a lot of grass and the female was seen collecting tussock grass blades throughout the day, she never travelled more than 40 m from the nest to collect this material. The male did not appear to take part in nest building but sang occasionally nearby. There were also some feathers in the nest that day arranged in the cup as if about to receive eggs. However on 25 May the nest was lined completely with copious amount of animal hair and had a well-formed cup. The nest was again examined on 27 May when it contained one white egg, and the nest was last visited on 30 May when it held three eggs. This appears to be the first record of a Hume's Wheatear nesting in a tree hole anywhere in its range which extends from eastern Arabia and Iran to Kashmir. Another bird was flushed from a large olive tree with many holes at site 8 on 29 May, despite the bird scolding me no nest could be located but it seemed almost certainly to be in one of the tree holes.

Streaked Scrub Warbler *Scotocerca inquieta*. An uncommon resident, seen most days in pairs or very small groups throughout the reserve. It is a noisy species that moves around a lot and can give the impression that it is more numerous than is the

case. Breeding was probably complete by the end of April, although there was one observation of food carrying on 21 May.

Eastern Olivaceous Warbler *Iduna pallida*. Only recorded in the canopy of a large olive tree at site 1 on 18 and 21 May. It was methodically gleaning the outer leaf foliage, very agile and hanging, reaching and sometimes leaping to take prey items. It gave no song or call and did not respond to a recording played to it. It is not yet recorded as a breeding species in the area but there are records in the reserve on 10 June and 25 June so breeding is likely.

Eastern Orphean Warbler *Sylvia crassirostris*. A local breeding summer visitor in the Jebal al Akhdar range, above 2000 m, including Hayl al Jawari. It was recorded most days from 27 April, but only on the lower plateau (at sites 1–8). It was found in places with thick bushy cover and tall juniper trees. It finds its food mainly in the outer branches of juniper trees but was also seen occasionally gleaning the outer branches of olive and buut trees. Several males might sing at the same time, often only 40 m apart but song was intermittent, birds might sing well for ten minutes or so and then become quiet and could not be found. The most frequent singing was late morning 10.00–12.00 h. Towards the end of May song could be heard in the predawn chorus and also after sunset. One male tracked during an extended song period moved around continuously from tree top to tree top feeding and singing over an area of c1.75 ha. Song was mostly given unseen from the shaded topmost branches of juniper trees. There were no records of pair chases, males showing aggression to each other, birds carrying nesting materials or collecting food for young, and the overall impression gained on leaving on 30 May was that active nesting had not yet started. There is an OBRC record of a female carrying a faecal sac on 9 June 2013.

Hume's Whitethroat *Sylvia althaea*. An uncommon local summer visitor to the highlands above 2000 m of the Jebal al Akhdar, northern Oman. Not yet confirmed to breed but there are records on the OBRC database in the area in June and July so almost certainly does breed. Observed Hayl al Jawari from 19 May although suspected a day or two before that date, and then seen/heard almost every day but only on the lower plateau. In the field it gives the impression of a dark capped Common Whitethroat *Sylvia communis* rather than similarity to the Lesser Whitethroat *Sylvia curruca*. Compared to the Eastern Orphean its flight is jerkier and it flies more often in the open, sometimes for distances of 100 m. It is much more likely to show itself during feeding and singing than the Eastern Orphean Warbler. Also regularly sings in flight which the other species only did once. It occupies the same juniper, olive, buut forested sites and thick scrub areas as the Eastern Orphean Warbler but it spends much more time in olive trees gleaning the tops and outer branches for invertebrates than that species. It also visits buut trees but less frequently junipers. Sometimes it is seen at ground level and in low bushes which the other species avoids. No interactions were noted between the two species. There were no records of birds collecting nesting material, food for young or of juveniles and the impression gained on leaving on 30 May was that the species had not started nesting. Only about half as numerous as the other *Sylvia* species.

Arabian Babbler *Turdoides squamiceps*. Resident throughout the reserve, seen or heard almost every day, always in small groups which are mobile and relatively wide ranging. Breeding was thought to be complete at the start of the survey as no evidence of active breeding was recorded.

Turkestan Shrike *Lanius phoenicuroides*. A common migrant with a few in winter in northern Oman and a rare breeding visitor in the highlands above 2000 m. A very few birds were present on the lower plateau but it was not recorded for sure on the upper plateau. One was seen catching invertebrates disturbed by a group of donkeys. This species is secretive when nesting and it could be difficult to locate. A nest was found on 6 May and its progress was monitored until 29 May. It was placed c8 m above ground level in a mature juniper tree, on a branch c80 mm wide, placed in a multiple fork where foliage concealed the nest from all directions except from below. The nest was untidily constructed but quite compact, only the outer nest was seen which was made of grasses, twigs, juniper bark strips and included a piece of polythene and a red plastic net bag, the type oranges are sold in. Nest building was noted on 6 May, both adults were at the nest site in the following days the male apparently feeding the female on the nest, chattering and singing, also there were aggressive encounters with other males. Last observed incubating on 28 May, on 29 May both adults appeared to be feeding young in the nest. Another nesting pair was present on nearby Jebal Shems.

Brown-necked Raven *Corvus ruficollis*. A widespread resident in small numbers throughout northern Oman, a pair was noted on two occasions in the reserve, once on the lower plateau and again near a military antenna of the upper plateau. Nesting would have taken place early in the year.

Common Rosefinch *Carpodacus erythrinus*. There are records on the OBRC database of adults in breeding condition and in song and juveniles of indeterminate age in June and July at Hayl al Jawari (OBRC). It seems very likely that the species breeds. None were observed or heard in May 2017.

Striolated Bunting *Emberiza striolata*. A widespread resident in the highlands of northern Oman. There are records on the OBRC database from Hayl al Jawari but it was not recorded there during May 2017, however one was seen nearby on 19 May and it was commonly singing Jebal Shems 17 May.

OTHER POTENTIAL BREEDING SPECIES

There have been single records of Sand Partridge *Ammoperdix heyi*, Short-toed Snake Eagle *Circaetus gallicus* and Common Kestrel *Falco tinnunculus* at Hayl al Jawari all of which are potential breeding species but none of them were seen during 2017. I had a single observation on Jebal Shems on 30 May of an adult white phase Booted Eagle *Hieraetus pennatus*, where it was circling over a juniper and olive clad hillside. The species breeds through Turkey, northern Iraq and northern Iran and migrates through the Arabian peninsula in small numbers. This was the first record from the northern Oman highlands during the summer period. A record in northern Oman at this date opens the possibility that the species could breed in northern Oman.

The only *Strix* owl species occurring in northern Oman is Hume's Owl *Strix butleri*, its distribution is very poorly known in the region. One objective of the present study was to try to determine whether this newly discovered species for Oman occurs in the Hayl al Jawari region. A single intriguing observation is reported. On 10 May at the eastern extreme of site 3, I heard at c07.30 hr (in daylight) a single tremulous hoot lasting c1.5 s, which sounded like the hoot that some *Strix* owls give during daylight hours when young are left alone in the nest. At this site a sound recording of Hume's Owl was played over a period of c30 minutes on three occasions and at two other occasions elsewhere at dawn and sunset but no further *Strix* hoots were heard. Interestingly a shepherd boy met at

the rock where the owl was heard was able to pick out the call of *Strix butleri* as known to him, having listened to various recordings of owls. He was able to imitate its call very convincingly. More study is needed in the area to determine if *Strix butleri* does indeed occur at Hayl al Jawari.

Lichtenstein's Sandgrouse *Pterocles lichtensteinii* is a relatively common breeding resident of northern Oman, it occurs mainly below 2000 m in stony, rocky habitats. A single observation of an almost full grown juvenile was made outside the reserve at 1300 m on 16 May. However on 20 May a bird thought to be this species was heard calling, early morning, at Hayl al Jawari, site 1. If the species is breeding in Hayl al Jawari then it is very scarce.

There are three species breeding nearby in the highlands which were not recorded in Hayl al Jawari. These were Eurasian Collared Dove *Streptopelia decaocto*, which was not present above 650 m at Hamra (a town on the approaches to Jebal al Akhdar). Purple Sunbird *Cinnyris asiaticus* which was seen on Jebal Shems, feeding at flowers of *Calotropis* and also above Hamra, it may merely visit higher altitudes to feed after breeding at lower levels. The House Sparrow *Passer domesticus* breeds at human sites at the same altitude as Hayl al Jawari on Jebal Shems some 11 km southeast.

OBSERVATION OF MIGRANTS

Previous observations in the highlands of northern Oman indicate that only a small number, both in terms of species diversity and total numbers, of migrant species pass through or stay any time in these mountains and this especially applies to the end of the spring migration season *ie* late April and May. Only eight species of migrants and non-breeding visitors were recorded at Hayl al Jawari during the survey, none were present everyday or were numerous, these were:

European Roller *Coracias garrulus*
Blue-cheeked Bee-eater *Merops persicus*
European Bee-eater *Merops apiaster*
Common Whitethroat *Sylvia communis*
Spotted Flycatcher *Muscicapa striata*
Willow Warbler *Phylloscopus trochilus*
Swallow *Hirundo rustica*
Reed/Marsh Warbler *Acrocephalus* sp

OTHER FAUNA

Excluding the feral goats and donkeys (see below), four mammal species were recorded within Hayl al Jawari, mostly through use of a trail camera. Species noted were a medium sized bat (Chiroptera) seen at dusk around juniper trees; Red Fox *Vulpes vulpes* was recorded several nights coming to a camera trap on the lower plateau; a gerbil sp (probably Wagner's *Gerbillus dasyurus*) was photographed by a trail camera on the lower plateau and appears to be common; Black Rat *Rattus rattus* was observed in the daytime near rubbish and photographed at more than one camera trap site on the lower plateau. There was no evidence gained of any wild herbivores such as Ibex *Capra ibex*, Arabian Tahr *Hemitragus jayakari* or gazelle *Gazella* sp however there is certainly suitable habitat for these species should the reserve be further protected through the installation of effective fencing, banning hunting and the removal of domestic stock and feral donkeys. Other vertebrates included an amphibian and three reptiles. Invertebrates included ten butterflies and five dragonfly species were photographed and identified.

SOME CONSERVATION ISSUES

The integrity of the natural environment of the Hayl al Jawari area is under threat from three sources, large numbers of stock animals (sheep and goats) appear to have uncontrolled access to the reserve area for at least a major part of the year, resulting in overgrazing and excessive browsing; similarly the presence of a population of feral donkeys every day is exacerbating the over-grazing by domestic stock and tourist and casual visitors result in damage to trees and they litter. These threats reduce the diversity of plant species and vegetation generally and stop regeneration of perennial plant species.

Sheep and goats

Today grazing of stock animals is largely uncontrolled with flocks concentrating on the most heavily vegetated parts but when times are lean flocks may visit every part of the reserve area. The exact status of grazing flocks within the reserve is not known but it would seem it is theoretically restricted as graziers were seen to bring flocks to the edge of the reserve and then encourage them to enter but not accompany them into the reserve itself. No precise or structured counts were made of grazing flocks within the study area but early morning flocks of goats (and a few sheep) encountered entering the reserve from the direction of a village to the east (at site 3) and from another village to the south (at sites 6/7) were counted as 190 on 6 May and 256 on 24 May, respectively. These counts were not thought to be unusual so there would seem to be upwards of 400 stock animals in the reserve on most days. All of the specially identified sites on the lower plateau (sites 1–8) were much frequented by flocks. Goats are particularly destructive, they are well known to browse trees and bushes by standing on their hind legs and even climbing into trees. They nibble any vegetation that might be nutritious. Sheep were seen to get on their knees to eat tiny 2 mm sprouting plants and some were even scratching at the ground with their front hooves to expose emerging shoots and perhaps roots. In early May observations suggested that every edible plant that could be found or reached by goats and sheep had been eaten and this had resulted in a complete absence of fresh grass and flowering annuals. A very few juniper seedlings were noted but no examples of olive or buut seedlings were found. Because stock animals are no longer accompanied by herders individuals do go feral and the future feral population of goats may well continue the overgrazing problem even if domestic flocks are excluded from the reserve.

Donkeys

Feral breeding animals are now widespread in the highlands of northern Oman, they originate from domestic animals turned loose after their usefulness as beasts of burden came to an end with the coming of motor vehicles and roads. They have no predators and exert an unnecessary extra pressure on the environment of the reserve 365 days a year. They were noted as particularly hungry in late April and early May, when there was no green vegetation, they were raiding litter receptacles to find food, including cardboard and were bold and persistent around campsites. A count on the lower plateau on 28 May found 19 animals there with probably a few more missed. If there were similar numbers on the escarpment and upper plateau then Hayl al Jawari may have upwards of 50–60 donkeys.

Human impacts: tourism and visitors

Hayl al Jawari is a scenic area with wonderful shady stands of juniper and olive trees which people obviously wish to enjoy. However tourists have not always been a positive force within the reserve. From about 2008 when the area was first opened with a track from the main tourist sites of Jebal Shems, the site became increasingly popular with



Plate 4. During the survey a good example of the type of negative impact of casual visitors was witnessed. A group of young men were stopped from entering the Hayl al Jawari reserve in their car by the guard, they then proceeded to a track outside the reserve but adjacent to sites 1, 5 and 8 where they set fire to a group of four juniper trees. Their visit only lasted a couple of hours and they were definitely associated with the burning trees but whether the fire was deliberate or a careless accident is not known. All four trees were destroyed. Note how the humus-rich soil smoulders several metres from the actual fire and can thus spread to other trees. © Mike Jennings

tourists and weekend campers. As numbers of visitors increased problems started to arise with damage to vegetation by overuse, by fires, rubbish left and wildlife hunted and disturbed. So much damage was being done that the area eventually was protected by a guard post and a physical barrier preventing vehicular access in 2013–14. In 2017 the gates were manned or locked continuously which effectively kept day trippers from the reserve, except those on foot. This has meant that the site has been able to recover a little from tourist pressure in the last 2–3 years. Today the only access to the site is for children going to school and their teachers and local people on foot. There is no access to day trippers, campers or other outsiders in vehicles. At about 2013 a military camp was created on the top of Jebal Sarah and a track constructed up the escarpment and along the upper plateau. That track is a physical barrier on the escarpment near to site 7, with a locked gate preventing unauthorised vehicles getting to the top of Jebal Sarah. Whilst the use of the reserve area by the public should be welcomed on a controlled basis there needs to be some form of penalty structure in place for those who transgress the park rules.

CONCLUSIONS

Results of the present study and previous research show that the avifauna of Hayl al Jawari has at least 29 breeding species and a small number of other species probably breed. This puts the site at least on a par with any similar site in the Jebal Al Akhdar mountain range. Indeed there are species found at the reserve that are very rare elsewhere in these

mountains and in some cases not found breeding anywhere else in Arabia. The region is not of particular importance for migrant species generally and only a small range of species and low numbers migrate through the area. Population levels are generally healthy and bird habitats are diverse. Although there remains generally good indigenous tree cover throughout the study area, the flora of the lower plateau is much threatened by overgrazing by stock animals and feral donkeys and further degradation of natural habitats can be expected in the future if nothing changes. Whilst uncontrolled tourism is a threat to the local fragile environment (Plate 4) there is much scope for local people and visitors to enjoy the unique site given proper control and regulation. Being one of the best remaining highland natural habitats left in northern Oman the site offers a wonderful setting for a properly protected area. Such a reserve would be invaluable for the study of indigenous plants and fauna and might also be a centre for the reintroduction of native ungulate fauna.

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LITERATURE CITED

- Eriksen, H & J Eriksen. 2013. *Hayl al Jawari, 11-12 July 2012 and 9-11 June 2013*. Privately published.
Gallagher, MD. 1977. Birds of Jabal Akhdar. *Journal of Oman Studies (Special Report)*: 27–58.
Jennings, MC. 2009. Is the Orphean Warbler breeding in Northern Oman? *Phoenix* 25: 1–2.

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