

The State Of Jordan's

Birds

2013



The black morph Desert Lark is a species restricted to the black lava desert of Jordan

برية الأردن
Wild Jordan



الجمعية الملكية
لحماية الطبيعة
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FOREWORD

Birds are considered one of the most important vertebrate groups in the world since they play a major role in numerous ecological processes, as well as being appreciated by people for their astonishing calls and marvelous colours. Sadly, this group is encountering a huge deterioration which is tipping the majority of its populations and species closer to extinction.

The diversity of birds recorded in Jordan is amazing and this is primarily due to the location of Jordan between three continents. This has led to the presence of a variety of species with the Afrotropical, Oriental and Palearctic origins. Major migration routes, specifically the Jordan Rift Valley, also play a major role in enhancing the numbers of bird species occurring in Jordan.

So far, a total of 434 bird species have been recorded and still new records are being added. For this reason, Jordan has always been a land for ornithologists and conservationists interested in birdwatching and monitoring. Nevertheless, bird species are under severe threat in Jordan and, if we don't manage this situation, many of the species which we are familiar with will disappear, mainly due to destructive human activities.

The Royal Society for the Conservation of Nature has been very active in conserving bird species through implementing laws and establishing protected areas. However, much of the habitat that birds depend on are outside our protected areas. The destiny of this wider environment is critical for conservation, and therefore more efforts must be made to protect these wonderful creatures.

I am very confident that this report "The State of Jordan's Birds" will be welcomed by conservationists, practitioners, communities and policy makers alike, providing guidance and raising awareness of the importance of birds and the urgent need for conservation measures.

We hope that this report will sound an alarm in the minds of all those concerned for the sustainability of bird diversity and wider biodiversity in Jordan, waking us up to the huge efforts needed to implement effective actions to safeguard our birds and their habitats .

I would like to praise the Royal Society for the Conservation of Nature (RSCN) and BirdLife International for this important publication and acknowledge everyone involved in its creation for their valuable contributions.

H.E. Khalid Irani
President, Board of Directors of the Royal Society for the Conservation of Nature
Chairman of BirdLife International



FOREWORD

The Royal Society for the Conservation of Nature is an independent, nongovernmental organization devoted to the conservation of Jordan's natural heritage. RSCN was founded in 1966, with His Majesty the late King Hussein as Honorary President, and has been given the responsibility by the Government to care for and protect the Kingdom's biodiversity. As such, it is one of the few voluntary organizations in the Middle East to be granted such a public mandate. RSCN has gained a wide global fame for its pioneering work in integrating nature conservation programmes with socio-economic development.



The RSCN is working with a mission of "create, manage and advocate for a national network of protected areas to conserve Jordan's biodiversity and support local community development, while promoting wider public support and action for the protection of the natural environment within Jordan and neighboring countries" .

Since its establishment, the RSCN achieved nature conservation through several means including 1) setting up and efficiently managing a national network of protected areas to conserve sites representing Jordan's ecosystems and habitats, 2) enforcing hunting laws, specifically in protected areas and other areas of special biodiversity values, 3) implementing development initiatives targeting local communities living around protected areas, 4) developing a national environmental education program targeting local students who live around protected areas hoping to form a nucleus for future employees in protected areas, 5) providing training and capacity building programmes for RSCN staff and other active national and regional organizations working in the field of nature conservation, 6) expanding in membership (including 'Friends'), sponsorship and support programmes to widen the public and political support base for RSCN programmes.

This report titled "The State of Jordan's Birds" will certainly raise awareness and knowledge about the spectacular biodiversity in Jordan among responsible people and organizations from the government, NGOs, private sector, conservationists, decision makers and public and will indeed support nature conservation in Jordan

I would like to extremely thank all people who contributed their time and knowledge to make this work achievable, and my appreciation extended to BirdLife International for the continuous support in bringing out this publication.

Yehya Khaled
Director General- RSCN

FOREWORD

Jordan lies on the eastern flyway between northern Eurasia and Africa. Each year countless numbers of migrant birds pass through on their way between their northern breeding grounds and African wintering areas. The variety of birds that use this flyway is truly staggering. Although Jordan is 80% desert, with its own characteristic breeding avifauna, there are also many exciting habitats and spectacular scenery that offer breeding sites and refuges to passing migrants.



On my first visit to Jordan in April 2000, the Royal Society for the Conservation of Nature (RSCN) gave me a fantastic opportunity to visit many parts of the country to map the birds that occurred there. I saw the flat, desolate expanse of the Eastern Desert, rugged grandeur.

November that same year I fell in love with the small pools and reedbeds of the Azraq Wetland Reserve, and I first witnessed the flooded Qa al Azraq with its tens of thousands of ducks and waders, one of the most impressive wildlife spectacles in the Middle East. My subsequent visits to Jordan, most recently in April 2011, have shown me how tremendously varied the migrant and breeding avifauna are.

The RSCN has striven to protect the varied habitats and wildlife of Jordan in a world where human activity often puts those invaluable natural resources at risk. The Society's hard working and dedicated staff has set up a magnificent network of reserves and protected areas where biodiversity can thrive. Their high quality research work has provided insights into many aspects of Jordan's wildlife. By enforcing wildlife law, RSCN has combated those who would seek to destroy that very resource. Through their work with children and local communities, they have been able to put many Jordanians in touch with their exceptional natural heritage.

Since 1995, Ian Andrews's fine book "The birds of the Hashemite Kingdom of Jordan" has given all with an interest in birds a wonderful resource to inform their interest. This new report has taken that work further, providing an unparalleled insight into Jordan's birds. It explores every aspect of Jordan's avifauna and looks in detail at the issues that affect them. All too often it is man's many activities that put at risk this wonderful natural asset. RSCN will continue to work for wildlife and people under very difficult circumstances. This report will make a significant contribution to that important task.

Pete has been involved in bird research in Jordan for more than a decade ever since his first visit to the country to help in building the capacity of researchers for the waterbird census. Since then, Pete has not stopped coming back.

Pete Ellis
Royal Society for the Protection of Birds (RSPB)
Northern Isles Manager, UK

ABOUT THE REPORT

The Royal Society for the Conservation of Nature (RSCN) is the Partner of BirdLife International in Jordan. RSCN works on bird conservation through research and the Important Bird Areas (IBAs) programme. It has played a key role in protecting a variety of bird species, including nationally and globally threatened species, through establishing protected areas in Jordan.

This report is nothing more than a humble endeavour by the authors to pay homage to the beautiful birds that, in one way or another, use the astounding nature of Jordan during their lives. The idea to produce such a report was merely a notion in the minds of several people for many years and now it has become a reality. The birds of Jordan have gone through many ups and downs through documented history. This report tries to put some of these stories on record. The authors hope that this documentation of the diversity of birds of Jordan will be used as a tool to raise the awareness of Jordanians of all ages about these magnificent creatures that share with them the earth, water and air of this majestic land.



Pregerine Falcon
© Sameh Odeh

INTRODUCTION

The birds of Jordan

Birds are considered an important part of all ecosystems since they provide several ecological processes and services, such as pollination, seed dispersal and pest control, and they are exceptional indicators of environmental viability. Despite the relatively small area of the Hashemite Kingdom of Jordan, it is home to a huge variety of bird species. Over years of ornithological studies and field trips in Jordan, a total of 434 species, belonging to 66 families, have been recorded. Of these, 69 species are breeding residents, 21 are migrants that are only present during the non-breeding season, and 344 are migrants which pass through the country between their breeding and non-breeding grounds. Among the total bird species recorded, 98 are considered rare or accidental, and three are introduced.

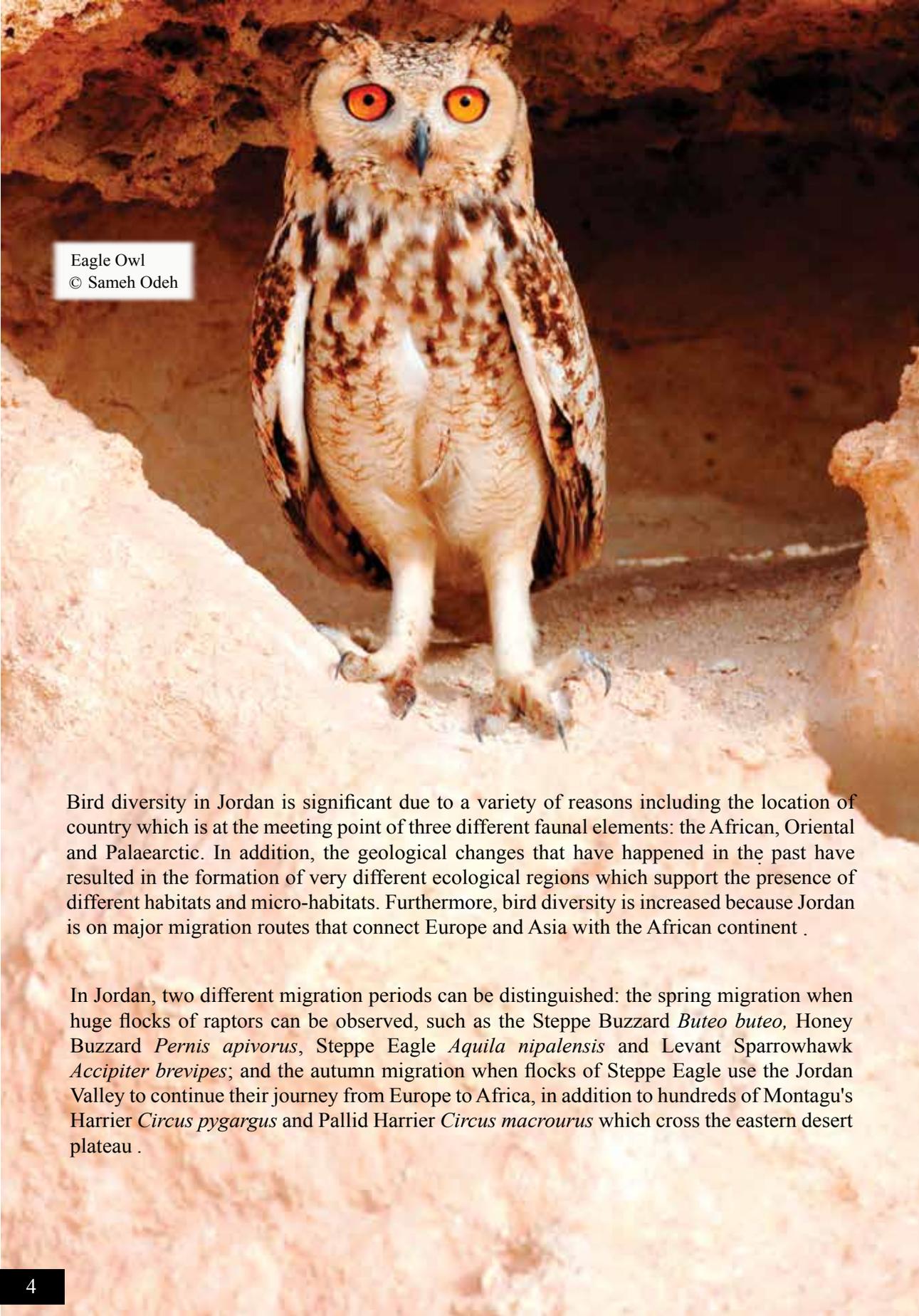
A total of 34 species that occur in Jordan are assessed as globally threatened by BirdLife International on behalf of the International Union for the Conservation of Nature and are listed as such on the IUCN Red List, including three Critically Endangered (CR), three Endangered (EN) and six Vulnerable (VU) species, with a further 14 species assessed as Near Threatened (NT). Despite the lack of a national Red List for bird species in Jordan, declines have been observed in many other species.



Sinai Rosefinch
© Sharif Jbour



Montagu's Harrier
© Sameh Odeh



Eagle Owl
© Sameh Odeh

Bird diversity in Jordan is significant due to a variety of reasons including the location of country which is at the meeting point of three different faunal elements: the African, Oriental and Palearctic. In addition, the geological changes that have happened in the past have resulted in the formation of very different ecological regions which support the presence of different habitats and micro-habitats. Furthermore, bird diversity is increased because Jordan is on major migration routes that connect Europe and Asia with the African continent .

In Jordan, two different migration periods can be distinguished: the spring migration when huge flocks of raptors can be observed, such as the Steppe Buzzard *Buteo buteo*, Honey Buzzard *Pernis apivorus*, Steppe Eagle *Aquila nipalensis* and Levant Sparrowhawk *Accipiter brevipes*; and the autumn migration when flocks of Steppe Eagle use the Jordan Valley to continue their journey from Europe to Africa, in addition to hundreds of Montagu's Harrier *Circus pygargus* and Pallid Harrier *Circus macrourus* which cross the eastern desert plateau .



Red-backed Shrike
© Nashat Hamidan



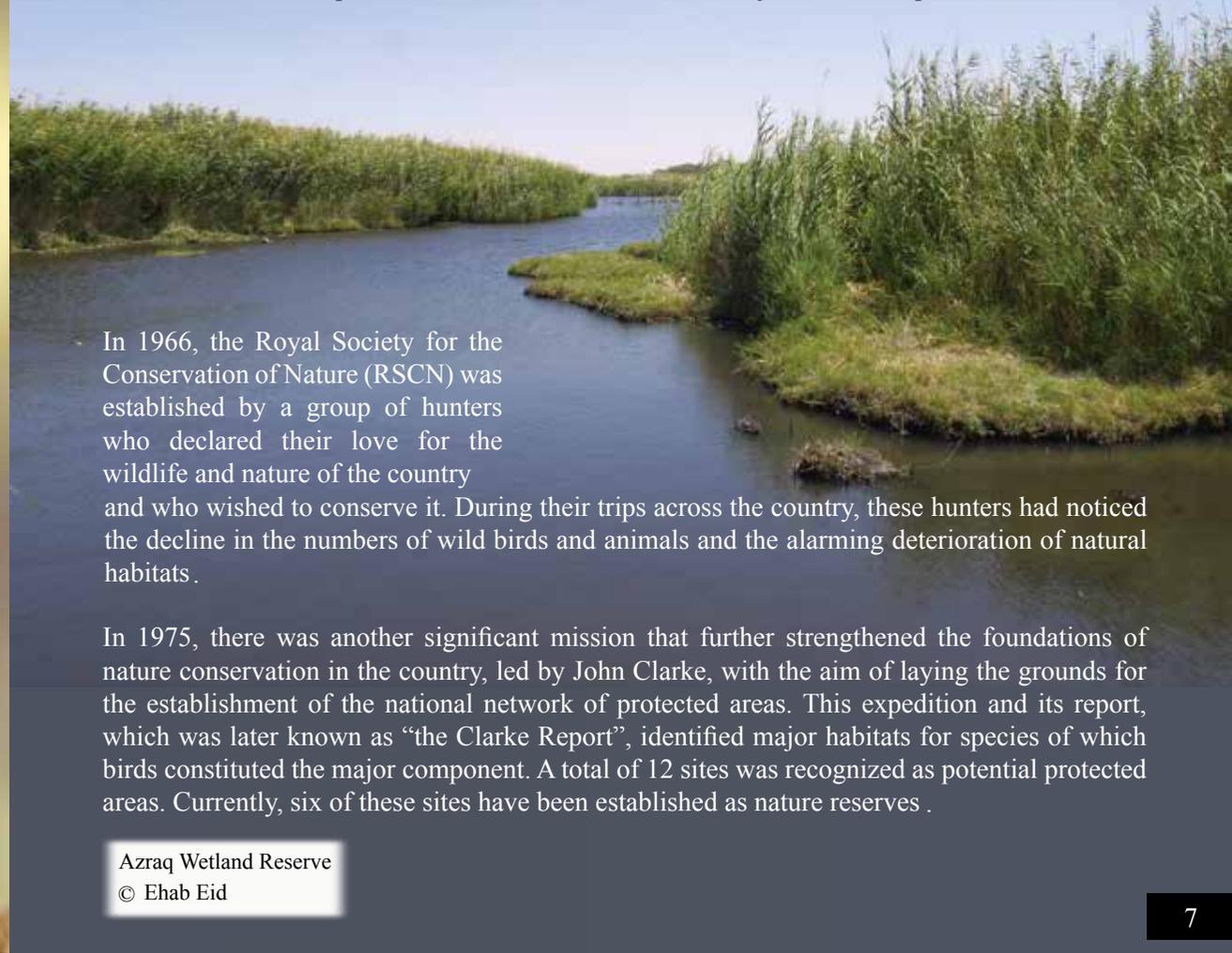
Scops Owl
© Sameh Odeh

STATE

A brief history of nature conservation

Nature conservation in Jordan has a relatively long history compared to other countries in the region. In 1922, almost one year before the start of the British Mandate over what used to be called Transjordan, the importance of conserving Jordan's forest and rangelands was recognised by the declaration of the first conservation act. This declaration resulted in the establishment of 23 rangeland areas. A few decades later, His Late Majesty King Hussein Bin Talal's vision was instrumental in institutionalizing nature conservation in the country.

In 1963, under His Majesty's guidance, an expedition comprising 12 British trained researchers set out specifically to study the flora and fauna of Jordan. The expedition's report provided "recommendations to enable the Jordanian Government to take full advantage, under a co-ordinated long-term plan, of the various potentialities represented by the natural resources of the country". The expedition was led by one of the most prominent ornithologists of that time: Guy Mountfort who later wrote the book "Portrait of a Desert: The Story of an Expedition to Jordan". This expedition was followed by two visits by Mountfort's team, in 1965 and 1966, and further recommendations were made to establish three nature reserves in Wadi Rum, Petra and Azraq, and to conserve two small areas in Ajloun and Zarqa Ma'in .



In 1966, the Royal Society for the Conservation of Nature (RSCN) was established by a group of hunters who declared their love for the wildlife and nature of the country and who wished to conserve it. During their trips across the country, these hunters had noticed the decline in the numbers of wild birds and animals and the alarming deterioration of natural habitats .

In 1975, there was another significant mission that further strengthened the foundations of nature conservation in the country, led by John Clarke, with the aim of laying the grounds for the establishment of the national network of protected areas. This expedition and its report, which was later known as "the Clarke Report", identified major habitats for species of which birds constituted the major component. A total of 12 sites was recognized as potential protected areas. Currently, six of these sites have been established as nature reserves .

Azraq Wetland Reserve
© Ehab Eid

Almost twenty years after the Clarke report, after major developments had affected some of the areas proposed earlier, a new survey was needed to evaluate the ecological, social and economic values of the protected areas originally proposed, and to identify additional sites. During 1997–2000, RSCN, in consultation with the General Corporation for Environment Protection (GCEP)—now the Ministry of Environment—and with assistance from the IUCN and a fund from the Global Environment Facility (GEF), carried out this review. As a result the Dibeen Forest Reserve was established, bringing the total to seven nature reserves.

In 2005, a further review of the proposed nature reserves located along the Jordan valley was carried out, during the preparations for the Integrated Ecosystem Management in the Jordan Rift Valley project. As a result, a further three were established as protected areas, raising the total number of protected areas in the country to ten.

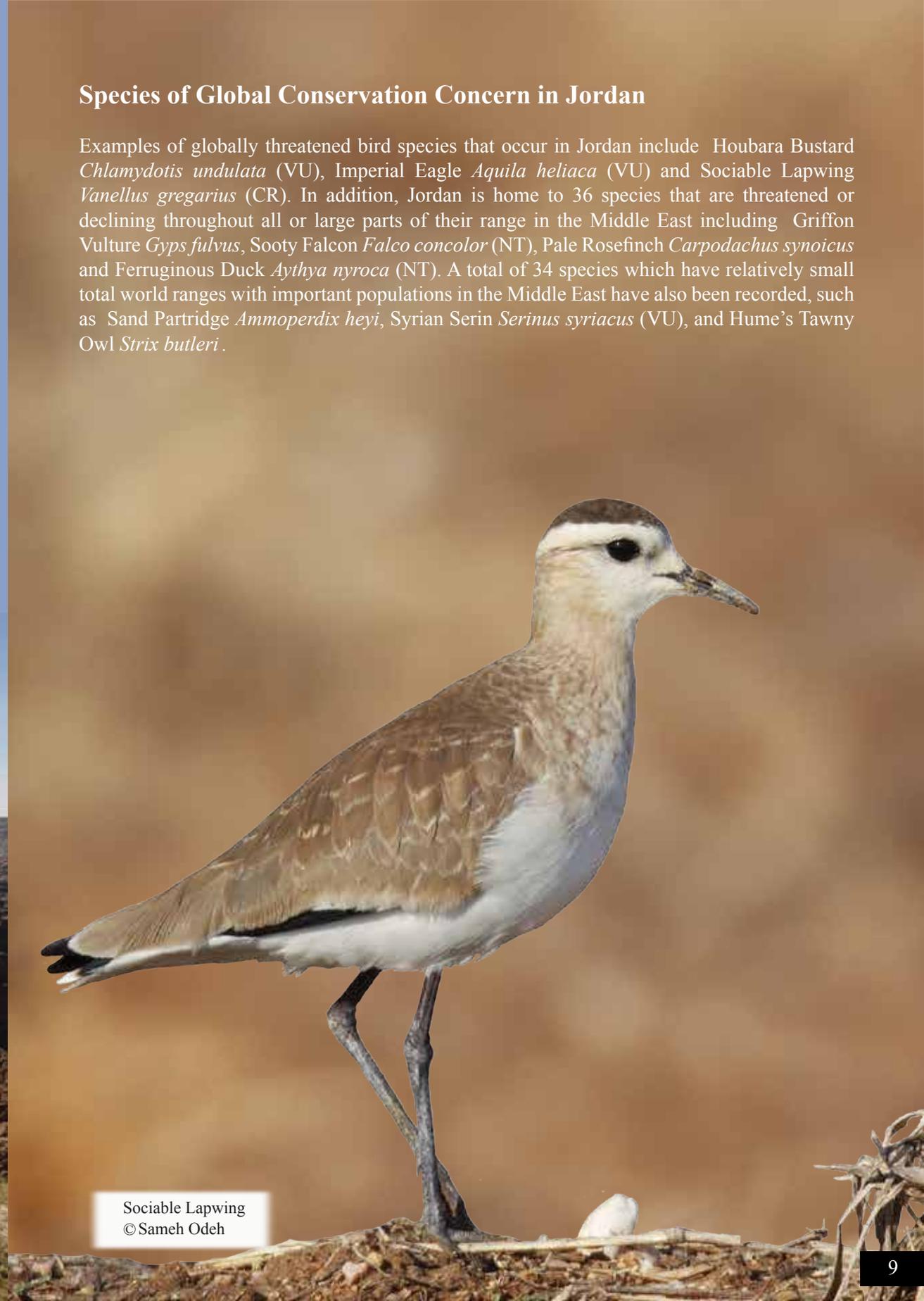
Although none of the protected areas in the country were established solely for the conservation of birds, all of them include bird species that are a priority for targeted conservation due to either their global status or their national or local status. For instance, Azraq Wetland Reserve, which had been proposed as a protected area since the 1960s, is one of the major stopover sites for birds migrating from West Asia, and one of the main objectives of its establishment is to conserve the bird species that migrate through and winter at the oasis, along with their habitats.



Dana Biosphere Reserve
© Ehab Eid

Species of Global Conservation Concern in Jordan

Examples of globally threatened bird species that occur in Jordan include Houbara Bustard *Chlamydotis undulata* (VU), Imperial Eagle *Aquila heliaca* (VU) and Sociable Lapwing *Vanellus gregarius* (CR). In addition, Jordan is home to 36 species that are threatened or declining throughout all or large parts of their range in the Middle East including Griffon Vulture *Gyps fulvus*, Sooty Falcon *Falco concolor* (NT), Pale Rosefinch *Carpodacus synoicus* and Ferruginous Duck *Aythya nyroca* (NT). A total of 34 species which have relatively small total world ranges with important populations in the Middle East have also been recorded, such as Sand Partridge *Ammoperdix heyi*, Syrian Serin *Serinus syriacus* (VU), and Hume's Tawny Owl *Strix butleri*.



Sociable Lapwing
© Sameh Odeh

Species	English Name	2012 IUCN Red List Status ¹	Distribution in Jordan
<i>Vanellus gregarius</i>	Sociable Lapwing	CR	A few records from the Eastern Desert
<i>Geronticus eremita</i>	Northern Bald Ibis	CR	Only recorded through satellite tracking where it was recorded passing over the Eastern Desert, over the Burqu area
<i>Leucogeranus leucogeranus</i>	Siberian Crane	CR	In 2001, there was a single record of three individuals in Qa Khannah ² , 35km northwest of the Azraq Oasis
<i>Falco cherrug</i>	Saker Falcon	EN	A passage migrant, mainly in spring
<i>Neophron percnopterus</i>	Egyptian Vulture	EN	A passage migrant over the Rift Valley
<i>Oxyura leucocephala</i>	White-headed Duck	EN	A rare winter visitor
<i>Aquila clanga</i>	Greater Spotted Eagle	VU	A rare passage migrant over the whole of the country
<i>Aquila heliaca</i>	Eastern Imperial Eagle	VU	A regular winter visitor in the Eastern Desert
<i>Marmaronetta angustirostris</i>	Marbled Teal	VU	Last record in 1990 but could still be visiting the Jordan River area
<i>Chlamydotis undulata</i>	Houbara Bustard	VU	A regular breeder in the Dana Biosphere Reserve
<i>Serinus syriacus</i>	Syrian Serin	VU	Very rare
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	VU	Occurs in the Gulf of Aqaba
<i>Puffinus griseus</i>	Sooty Shearwater	NT	Very rare vagrant with a single record in a century
<i>Aegypius monachus</i>	Cinereous Vulture	NT	A regular winter visitor, but in low numbers at Aqaba and a few dams along the rift margins
<i>Aythya nyroca</i>	Ferruginous Duck	NT	A regular winter visitor to the Eastern Desert
<i>Circus macrourus</i>	Pallid Harrier	NT	A regular passage migrant along the rift valley
<i>Coracias garrulus</i>	European Roller	NT	A rare passage migrant
<i>Emberiza cineracea</i>	Cinereous Bunting	NT	A regular breeder in southern Jordan
<i>Falco concolor</i>	Sooty Falcon	NT	A rare but regular passage migrant
<i>Falco vespertinus</i>	Red-footed Falcon	NT	A scarce spring passage migrant with records mainly in the Eastern Desert
<i>Ficedula semitorquata</i>	Semi-collared Flycatcher	NT	A regular migrant and winter visitor to water bodies and marshlands in the country
<i>Gallinago media</i>	Great Snipe	NT	A scarce migrant
<i>Glaucola nordmanni</i>	Black-winged Pratincole	NT	Restricted to Aqaba
<i>Larus leucophthalmus</i>	White-eyed Gull	NT	A rare winter visitor
<i>Limosa limosa</i>	Black-tailed Godwit	NT	A rare regular passage migrant and winter visitor
<i>Numenius arquata</i>	Eurasian Curlew	NT	

¹ CR: Critically Endangered Species, EN: Endangered Species; VU: Vulnerable Species; NT: Near Threatened Species

² Qa Khannah was one of the major seasonal mudflats in the desert of Jordan. Large records of waterbirds were recorded during the winter at this site, when flooded. It was considered to be nominated to become the second Ramsar site in the country, but unfortunately the site quality and importance for waterbirds has drastically deteriorated in the past decade. The main threat causing this deterioration is intensive quarrying.



Lappet faced Vulture
© Nashat Hamidan

It should be highlighted that most of the species in the table above are species that are not regularly recorded in Jordan. On the other hand, some of these species have important records and are of unique significance in the country. Most notably, Syrian Serin *Serinus syriacus* has most (80%) of its global population breeding in Jordan, specifically in the southern woodlands of the Dana Biosphere Reserve.

Most of the birds of prey mentioned above are all known to be regular passage migrants and/or winter visitors to Jordan. For instance, Imperial Eagle *Aquila heliaca* and Greater Spotted Eagle *Aquila clanga* are both large birds of prey that are known to pass through Jordan, following well known migration flyways during their journeys to their breeding and wintering grounds.

In this list, there are two special falcons. The first is Saker Falcon *Falco cherrug* which is a widely known falcon in the region as a whole, including Jordan. This agile falcon has been recently uplisted to Endangered on the IUCN Red List since it is believed that it is undergoing a very rapid decline. The main reason for this sharp decline is the unsustainable capture of the birds for the falconry trade. It is recorded in Jordan on passage, especially during the spring migration but still in low numbers. The other falcon is Sooty Falcon *Falco concolor* which is Near Threatened. This distinctive falcon, with its dark grey coal-coloured plumage, is known to breed in the rockfaces of Rum and Petra.



Greater Spotted Eagle
© Sameh Odeh

The Protected Areas Network

The Royal Society for the Conservation of Nature (RSCN) is responsible for managing nature reserves in Jordan under a mandate from the Government of Jordan. A nature reserve in Jordan is a protected area that is established and managed for nature conservation as its primary objective. Since 1966, the RSCN has been working towards establishing a network of protected areas. The selection and prioritisation of protected areas is primarily based on representation of vegetation types. Below is a brief look at the different protected areas in the country, and their significance for birds.



Ajloun Forest Reserve
© Yaseen Ananbeh

Shaumari Wildlife Reserve



Hoopoe Lark
© Sameh Odeh

Shaumari was the first nature reserve to be established by the RSCN in the country when it was declared by the Government of Jordan in 1975. Its main objective was and still is to secure natural habitats for the re-introduction of the extinct Arabian Oryx *Oryx leucoryx*. The reserve is about 22 km² and is located within the Saharo-Arabian bio-geographical region.

Studies conducted in the Shaumari reserve show the presence of 78 bird species including some of special importance such as Egyptian Vulture *Neophron percnopterus*, Pallid Harrier *Circus macrourus*, and Imperial Eagle *Aquila heliaca*. In addition, the reserve hosts several breeding bird species, some of which are considered Jordan specialties, such as Thick billed lark *Rhamphocoris clotbey*, Temminck's Horned Lark *Eremophila bilopha*, and Hoopoe Lark *Alaemon alaudipes*. Most of the unconfirmed reports of Houbara Bustard *Chlamydotis undulata* in the country are from around the reserve and it seems that the first confirmed record of this species in this century will come from somewhere around this site.



Shaumari Wildlife Reserve
© RSCN

Azraq Wetland Reserve



Marsh Harrier
© Sameh Odeh

In 1975, Azraq was declared by the Government of Jordan as a wetland reserve to be managed by RSCN, extending over an area of 12 km² and located within the Saharo-Arabian bio-geographical region.

Azraq is home to several resident bird species, but its importance lies in it being one of the most important stopover sites for thousands of migratory bird species. Avifaunal studies have been conducted in the Azraq oasis for more than 70 years and a total of 274 bird species have been recorded. The reserve, along with the whole area of Azraq, has deteriorated drastically due to unsustainable water extraction from its underground aquifer. Currently, the wetland reserve is less than 10% of the original size of the wetland.



Azraq Wetland Reserve
© Ehab Eid

Mujib Biosphere Reserve



Lesser Kestrel
© Sameh Odeh

Mujib was established in 1987 over an area of 212 km² aiming to protect a scenic area of the Jordan Rift Valley. The reserve was recently declared as a biosphere reserve since it integrates nature conservation with socio-economic development. The reserve is located within three biogeographical zones—Mediterranean, Irano-Turanian and the Sudanian Penetration zones—and covers five vegetation types.

Over years of ornithological studies performed in the Mujib reserve, a total of 221 species have been recorded. The topography of sandstone outcrops provides the perfect breeding habitats for several birds of prey including Bonelli's Eagle *Aquila fasciata*, Barbary Falcon *Falco pelegrinoides*, Eagle Owl *Bubo bubo* and Lesser Kestrel *Falco naumanni*. The reserve is located along the Rift Valley which is known to be one of the most important migratory flyways in the world. Millions of birds pass through this reserve on migration.



Mujib Biosphere Reserve
© RSCN

Ajloun Forest Reserve



Turtle Dove
© Sameh Odeh

Ajloun was first proposed by Mountfort's expedition in 1966 to be protected due to its natural importance. This recommendation was supported later in the Clarke report. Consequently, a reserve was established in Ajloun in 1989 over an area of 12 km² aiming at conserving a representative sample of the Evergreen Oak vegetation type, which is dominated by *Quercus coccifera*. Studies in the reserve have listed a total of 40 bird species such as Chukar *Alectoris chukar*, Turtle Dove *Streptopelia turtur*, Rock Thrush *Monticola saxatilis* and Blue Tit *Parus caeruleus*.



Ajloun Forest Reserve
© Ehab Eid

Dana Biosphere Reserve



Dana is considered by many as the jewel in the crown of conservation in the country. It was proposed for establishment within Jordan's network of protected areas during the Clarke expedition in 1975. The reserve was established in 1993. The reserve is located over an area of 292 km² covering a wide variety of vegetation types including most notably Phoenician Juniper *Juniperus phoenicea*. The reserve was the first to be announced as a biosphere reserve by UNESCO as it integrates socio-economic development with nature conservation. Dana holds the highest bird diversity of all Jordan reserves since it is located within the four bio-geographical zones of the country. More than 250 species of birds have been recorded including several regionally restricted and globally threatened species, including Syrian Serin *Serinus syriacus*, which has 75% percent of its global population breeding there .

Wadi Rum Protected Area



Mountfort proposed Wadi Rum to be established as a national park in 1966, over an area of 2,000 km². In 1975, Clark proposed this site as part of Jordan's network of protected areas due to its magnificent landscape and its representation of the sand dune vegetation type.

The reserve was established in 1996 by the RSCN and is currently managed by the Aqaba Special Economic Zone Authority (ASEZA). It is located in the Saharo-Arabian zone with an area of 720 km², making it the largest reserve in the country. A total of 119 bird species have been recorded including several breeding birds of prey, including Sooty Falcon *Falco concolor* which has the global status of Near Threatened.



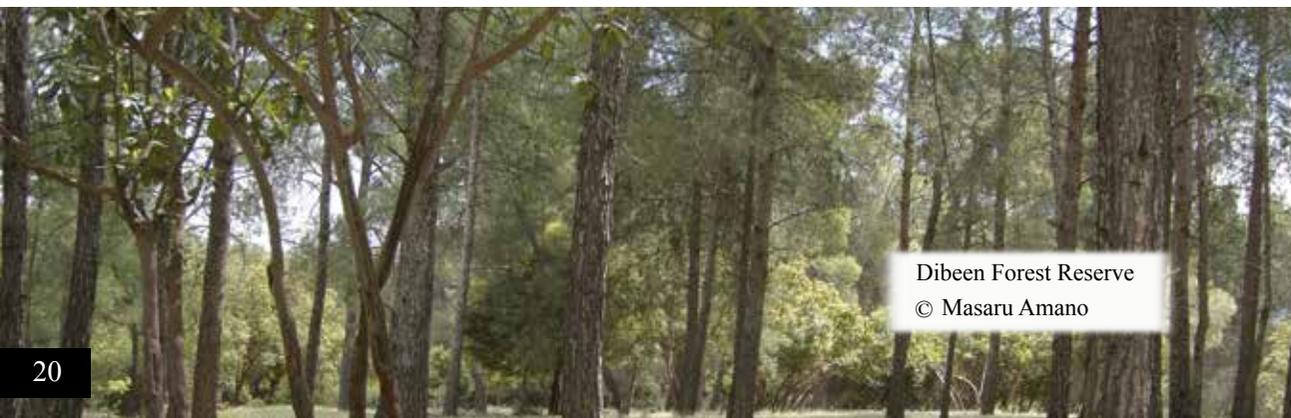
Dibeen Forest Reserve



Hobby
© Sameh Odeh

Although Dibeen was not proposed by either Mountfort or Clarke, the area was proposed as a protected area by RSCN's review of the protected area network in 1998. It was given the highest priority since it is the only location in the country where Aleppo Pine *Pinus halepensis* is known to exist naturally. The reserve was established in 2004 over an area of almost 9 km² and was established to conserve a representative sample of the Aleppo Pine vegetation type in Jordan.

Of the roughly 100 bird species recorded in the reserve, the globally threatened Greater Spotted Eagle *Aquila clanga* stands out as one of the most significant species recorded there. The reserve is also important for several wintering passerines such as Chaffinch *Fringilla coelebs*, Hawfinch *Coccothraustes coccothraustes* and Brambling *Fringilla montifringilla*. One of the key species and the main indicator of the health of the reserve habitats is Blue Tit *Parus carduelis* since it is a passerine that is directly connected to the Aleppo Pine trees dominating the reserve.



Dibeen Forest Reserve
© Masaru Amano

Yarmouk Protected Area



White Stork
© Sameh Odeh

Yarmouk was first proposed in 1998 by RSCN's review of the protected area network, since it represents the last stronghold of the deciduous oak *Quercus aegilops*, the national tree of Jordan. The reserve was established in 2010 over an area of 20.5 km², covering a series of hills overlooking Yarmouk River. Of the roughly 100 bird species recorded in the reserve, several globally threatened birds of prey and large migrants have been recorded migrating over the reserve and along the Yarmouk Valley which is considered to be an important 'sidetrack' leading to the major flyway of the Rift Valley. These species include Pallid Harrier *Circus macrourus*, Honey Buzzard *Pernis apivorus*, White Stork *Ciconia ciconia*, Black Stork *Ciconia nigra* among others. Typical Mediterranean woodland species have also been recorded in the reserve, such as Syrian Woodpecker *Dendrocopos syriacus*.



Yarmouk Protected Area
© Ayoub Al Far

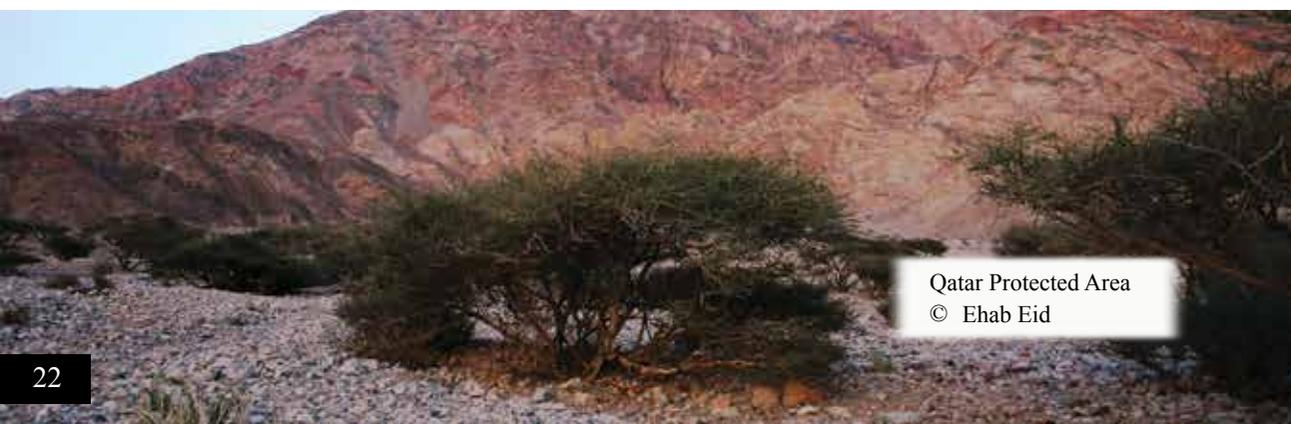
Qatar Protected Area



Arabian Warbler
© Sameh Odeh

Qatar was first proposed in 1998 by RSCN's review of protected areas. The reserve was established in 2011 representing the Sudanian bio-geographical zone. It is situated over an area of 110 km² and was established to conserve a representative sample of the hilly ground covered with hammada soil type hosting the highest density of Acacia woodlands in Jordan .

The reserve is located along the Jordan Rift Valley just north of Aqaba. The dense Acacia trees are a major spot for migratory passerines that use the area for roosting and as a stopover site before they continue their migration journey. The reserve is also a home for several typical desert breeding species including Sand Partridge *Ammoperdix heyi*, Hoopoe *Upupa epops*, and Arabian Warbler *Sylvia leucomelaena*, which is only recorded along Wadi Araba in the whole country.



Qatar Protected Area
© Ehab Eid

Fifa Protected Area



Dead Sea Sparrow
© Nashat Hamidan

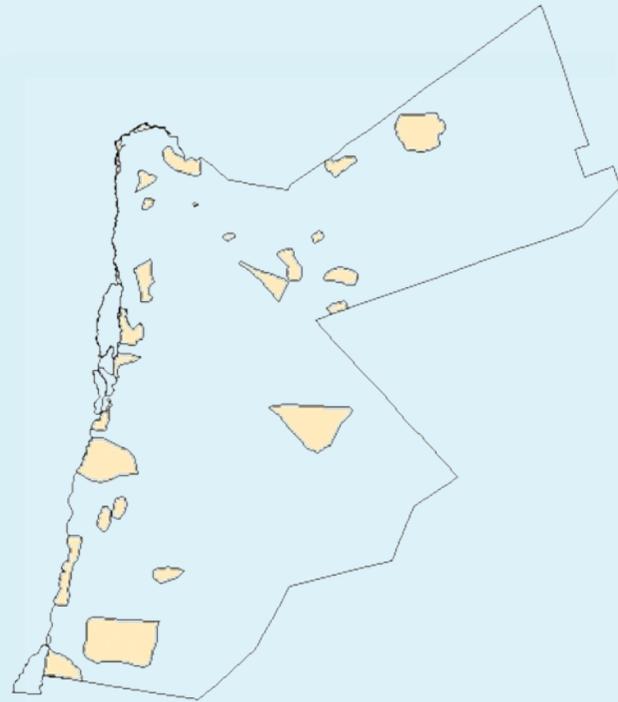
Fifa was first proposed in 1998 by the RSCN in order to represent and conserve the saline vegetation in the country. The reserve was established in 2011 by the RSCN within the Sudanian bio-geographical. zone. It is situated over an area of 26 km² covering Wadi Fifa and the Tamarisk-dominated saline vegetation. Fifa is located in the middle between the southern tips of the Dead Sea and the beginning of the desert of Wadi Araba. In addition to its importance for wintering passerines, the reserve is becoming increasingly important as one of the few remaining natural breeding habitats of Dead Sea Sparrow *Passer moabiticus*.



Fifa Protected Area
© Ehab Eid

Important Bird Areas

BirdLife International has initiated the use of birds in conservation planning through developing its “Important Bird Areas (IBAs)” programme, which aims to identify and conserve sites that have a global significance for birds, based on specific global criteria. The RSCN (the BirdLife Partner in Jordan) published the book “Important Bird Areas of Jordan” in 2000. Following surveys and consultation, 27 IBAs were identified covering an area of 7,600 km² which is around 8.5% of the total surface area of Jordan .



Sites identified as IBAs in Jordan included a variety of natural habitats that need to be conserved to sustain significant bird populations in the country. It should be mentioned that the aim of the IBA programme is not necessarily to establish protected areas in all identified IBAs, but to try and conserve these sites in a variety of appropriate ways to ensure that the habitats remain suitable for birds and other biodiversity. Although seven have already been established as nature reserves and a further seven are proposed as protected areas, the IBAs of Jordan also include four agricultural plains and several man-made habitats.



Burqu' Castle-Eastern Desert
© Ehab Eid

Bird Research

Since early times, explorers, naturalists and scholars have visited Jordan to explore its biodiversity with a special focus on birds. One such visit was by Henry Baker Tristram in 1865 when he described 348 bird species from Palestine with notes on the bird diversity in the Jordanian territories. His book, the “Land of Moab”, included several interesting notes, such as the breeding of Upcher’s Warbler *Hippolais languida*, the fact that Houbara Bustard *Chlamydotis undulata* was a very common species in the Jordan Valley, and reports of hundreds of nests of Griffon Vultures *Gyps fulvus* in Jarash near Zarqa River. Tristram’s curiosity in describing Jordan’s birds continued after his second trip in 1874, published in the second edition. Tristram mentioned falcon species were hunted from the eastern mountains of the Dead Sea, where Saker *Falco cherrug* was described as a much prized bird in Jordan, as well as both Peregrine *Falco peregrinus* and Lanner *Falco biarmicus* .

In 1922, the infamous British ornithologist, Richard Meinertzhagen visited the area from Amman to Ramadi in Iraq, where he described the Azraq oasis as "a perfect paradise for birds with green meadows, pools and bushes". In 1955, Philip Hollom, another British ornithologist, visited several areas such as Ajloun, Jerash, Tafila, Dana, Dead Sea, Jordan Desert, and Azraq; his notes included an important record of Houbara Bustard *Chlamydotis undulata* near Qasr Amra, as well as a description of bird migration in the country .



Upcher’s Warbler
© Sameh Odeh

The most comprehensive publication on Jordan's birds was produced by Ian Andrews, a scholar who has visited Jordan since 1989. His work was published in 1995 in his book "The Birds of the Hashemite Kingdom of Jordan". The book included very comprehensive species accounts, photos and illustrations on Jordan's habitats and landscapes and bird species. In 1994, Mike Evans, from BirdLife International, coordinated a review the avifauna of Jordan as part of a regional review and identified 17 sites as the first Important Birds Areas in the country.

The first baseline surveys were carried out in Dana, and the team then expanded its efforts into the other previously established reserves in the country. This was done in parallel with establishing bird monitoring programmes for bird indicator species. The results of these programmes have since become the guiding lights for the management of the different reserves.

Outside protected areas, the research and survey section of RSCN has been taking part in the International Waterbird Census since 1999, which proudly establishes Jordan as the country that has the oldest and probably the only regular national census for wintering waterbirds in the region.

As is always the case, research provides answers for some questions but raises further questions that need to be answered. That said, there is no doubt that the establishment of the research and survey section of RSCN has provided much information about the status and distribution of many key species in Jordan and their habitats. It has also provided a respectable amount of data about species that had not previously been studied or even recorded in the country. Still, this work has also raised several questions that need to be answered and analysed to understand how species and habitats react to changes and specific threats, and consequently the best approaches to ensure their conservation.



Saker Falcon
© Koujy Kawai



Little Bittern
© Sameh Odeh



White-eyed Gull
© Rula Zein-Iddin

PRESSURE

This is what conservation actions are all about: trying to minimize the impact of pressures that are caused by human activities in order to sustain wild populations of different species on the planet, and Jordan is no exception. For a relatively small country with very limited natural resources, striking the balance between development and conservation is a very tricky matter. Below is a brief look at some of the major pressures that are considered to have the greatest impact on bird species and their populations in Jordan .

The impacts of agricultural developments on birds in Jordan

The effects of agriculture vary among the different ecosystems of Jordan. In the rural areas of the west, particularly the northwest part of the country, which have sub-humid to semi-arid and sub-tropical and Mediterranean climates, traditional, non-intensive farming is gradually being abandoned and partly replaced by more intensive agriculture. Agricultural expansion, especially for olive and fruit plantations, occurs in many areas, including in those limited areas that contain remnant natural woodlands. In the arid parts of Jordan, which were used only as rangeland in the past, recent expansion of irrigated and often very intensive farming has also had obvious impacts on bird communities .

The impact of agriculture and of changes in farming practices in the sub-humid and semi-arid regions of Jordan may be classified according to intensity of use and the expansion / area of use within the landscape context. The intensification of agriculture can lead to a significant loss of



Agricultural Expansion
© Ehab Eid

bird diversity, as indicated by research in various countries. Intensification of agriculture often causes simplification of the landscape, and includes the use of pesticides and herbicides and the removal of marginal natural habitats, which lead to a decrease in food resources for both herbivorous and insectivorous birds.

Traditional farming in Mediterranean regions, on the other hand, can maintain or even increase bird diversity if it contributes to habitat heterogeneity at the landscape level. Bird diversity may be rather high and populations of rare species, e.g. Syrian Serin *Serinus syriacus*, may be sustained in a landscape mosaic that includes both large fragments of natural habitat and areas which are being used traditionally with low to moderate intensity.

In Jordan, sub-humid – semi-arid areas are limited to the northwestern part of the country and along a narrow strip on top of the highlands of central and southern Jordan. These areas are the most inhabited and most extensively used for agriculture; hence, much of the natural habitat has been lost and what remains is mostly unprotected, and currently being degraded and fragmented due to overgrazing, woodcutting and other side-effects of urban and rural developments such as new roads. The area of natural woodland (currently less than 1% of the total area of Jordan) which is of particular importance for many bird species is decreasing progressively due to wood cutting and land encroachment for agriculture.

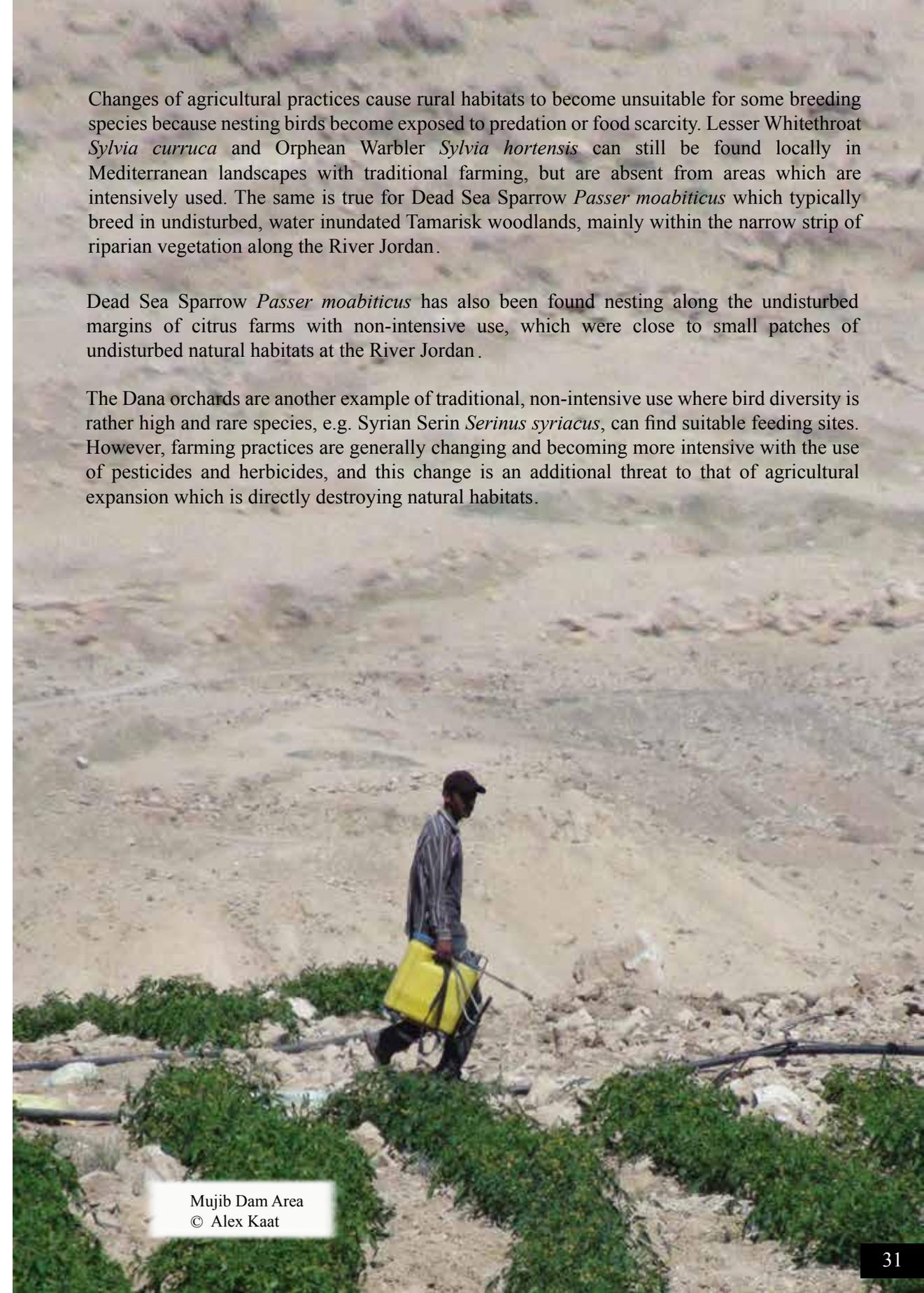
Very little research has been carried out on the impacts of agriculture on birds in Mediterranean-type ecosystems and the northern Jordan Valley. Nevertheless, many bird species can now be considered threatened at the national level due to continuous land encroachment which is destroying the remnant natural and undisturbed habitat many species depend on. Bird observations and surveys in the Jordan Valley and in Mediterranean-type woodland and non-forest habitats in Dana, Ajloun and Dibbeen show that many bird species have a restricted range in Jordan, mainly because they have very specific habitat requirements which can be fulfilled only locally. These include woodland species such as Wren *Troglodytes troglodytes*, Blue Tit *Parus caeruleus*, Eastern Orphean Warbler *Sylvia crassirostris*, Lesser Whitethroat *Sylvia curruca* and Syrian Serin *Serinus syriacus* in the highlands of western Jordan, and Dead Sea Sparrow *Passer moabiticus* and Nightingale *Luscinia megarhynchos* in the Jordan Valley. Other open shrubland species, e.g. Cretzschmar's Bunting *Emberiza caesia* and Upcher's Warbler *Hippolais languida*, and non-forest species of dry scrub, such as Long-billed Pipit *Anthus similis* and Spectacled Warbler *Sylvia conspicillata*, are also threatened by agricultural expansion.

Agricultural expansion is also affecting some of the birds restricted to the Jordan Valley including the banks of the River Jordan. In addition to Dead Sea Sparrow *Passer moabiticus*, Black Francolin *Francolinus francolinus* and Clamorous Reed Warbler *Acrocephalus stentoreus* have a restricted range and their small breeding populations in Jordan are vulnerable to habitat loss caused directly or indirectly by agricultural activities.

Changes of agricultural practices cause rural habitats to become unsuitable for some breeding species because nesting birds become exposed to predation or food scarcity. Lesser Whitethroat *Sylvia curruca* and Orphean Warbler *Sylvia hortensis* can still be found locally in Mediterranean landscapes with traditional farming, but are absent from areas which are intensively used. The same is true for Dead Sea Sparrow *Passer moabiticus* which typically breed in undisturbed, water inundated Tamarisk woodlands, mainly within the narrow strip of riparian vegetation along the River Jordan.

Dead Sea Sparrow *Passer moabiticus* has also been found nesting along the undisturbed margins of citrus farms with non-intensive use, which were close to small patches of undisturbed natural habitats at the River Jordan.

The Dana orchards are another example of traditional, non-intensive use where bird diversity is rather high and rare species, e.g. Syrian Serin *Serinus syriacus*, can find suitable feeding sites. However, farming practices are generally changing and becoming more intensive with the use of pesticides and herbicides, and this change is an additional threat to that of agricultural expansion which is directly destroying natural habitats.



Mujib Dam Area
© Alex Kaat

IBAs in Danger

Through a recent rapid assessment of the state of Important Bird Areas (IBAs) of Jordan, RSCN identified the main threats affecting each individual IBA and the scope and severity of these threats. One major observation, from the results of this assessment, is that the impact of the major threats on any individual IBA is considered at least medium. In other words, all of the IBAs in Jordan are under threat and each one of them is facing at least one serious long-term.

Still, some IBAs are more threatened than others and it is the wetland IBAs that are facing the most serious threats. Azraq, which was known as a major oasis in the northern Arabian Peninsula, has been facing intensive water extraction from the aquifer that is feeding it. This has led to the site shrinking to less than 10% of what it used to be half a century ago and for waterbirds, that used to be recorded in hundreds of thousands in the winters of the 1960s, to become scarce and barely seen in tens nowadays.

Apart from IBAs that are wholly or partially protected areas, most terrestrial IBAs in the country are facing habitat degradation and change due to direct human activities, including agricultural expansion, mining and overgrazing. It is quite challenging to identify specific areas or regions of the country where habitat degradation is higher than the rest since each region is facing its own threats. For instance, IBAs of the northern part of the country are mainly facing land transformation owing to urbanization, whereas in the south and east, it is mainly overgrazing and mining. As for the western part of the Jordan valley, the main threat is agricultural intensification.



Berket El Araies
© Lina Rifaii

The problem of alien invasive species

Within the past 50 years, Jordan has witnessed rapid changes in habitats, introduction of alien terrestrial and freshwater vertebrate species as well as other forms of environmental modifications. Due to lack of understanding of the potential ill effects of introduced species to the local fauna, several species meant for captive breeding, aquaculture production and as pet animals have been deliberately or accidentally released. Some of these species have reproduced and established populations in the wild.

There are 13 bird species that are considered introduced into Jordan. One example is Palm Dove *Streptopelia senegalensis* which has spread very rapidly to most parts of Jordan following agricultural expansion and urbanization during the second half of the 20th century. Another is White-eared Bulbul *Pycnonotus leucogenys* which was first recorded during 1990 in Aqaba, and later in Azraq in 1997. These birds were most likely cage escapees. In 1998, an illegal shipment of about 200 birds that was confiscated on the Iraqi border was released in Azraq. Thereafter, a resident population became established at Azraq. The current population is not known, but it has been recorded breeding mainly in farmland and orchards.

Another species that has a long history as an introduced species in Jordan and in the region as a whole is Indian House Crow *Corvus splendens*. It first appeared in the Gulf of Aqaba in 1976 where it was most probably brought by ships from southern Arabia. The population apparently started to increase soon after its introduction reaching more than 300 birds. Nesting is observed mostly in large trees within the town and along the coastal palm groves. Currently it nests also at the northern outskirts of Aqaba, thus a northward invasion into the Jordan Valley is possible in the future. In addition to being a nuisance and possibly causing health problems (it may transmit gastrointestinal diseases to humans) in the city of Aqaba, this bird is generally known to be a nest predator, thus affecting the reproductive success of other bird species.



White-eared Bulbul
© Sameh Odeh

Another introduced bird species that is worth studying in order to assess its impact on native bird species and natural habitats is White-throated Munia *Lonchura malabarica*, also widely known as Indian Silverbill. This species breeds now in many areas in Jordan especially along the Jordan valley and is considered to be the most invasive bird species in Jordan .

Other introduced bird species that are worth noting are two Mynah species, Bank Mynah *Acridotheres ginginianus* and Common Mynah *Acridotheres tristis*. There are a few confirmed records of both species, but no breeding records yet. Still, it is believed that these species could become widely invasive along the Jordan Valley since they have been recently recorded in several West Asian countries.

Wind Energy: an emerging issue

The demand for wind farms is increasing worldwide. Many countries are engaged in the production of non-polluting "green energy" as part of national strategies to reduce carbon dioxide emissions. Concerns relating to the impact of historic, current and future global carbon emissions affecting climate and biodiversity have led many major conservation organizations to adopt a supporting position regarding renewable energy. However this has been tempered by concerns over the impacts that poorly sited wind farms may have on birds (and bats). Some wind farms have achieved notoriety for the number and range of birds killed, and are often cited by those opposed to wind turbines, e.g. the wind farms in Altamont Pass in the USA .

The Jordanian Government is encouraging commercial development of renewable energy, including solar and wind farms, as part of a strategy that aims to diversify energy sources and decrease dependence on imported fossil fuels for producing electricity.



Wind Farms- USA
Source: Internet- The SPPI blog

Several sites have already been proposed by the Ministry of Energy and Natural Resources where modern wind farms are to be established. These are concentrated on the top of the highlands of southwestern Jordan, from Tafila south to Rajif. Despite being suitable sites for wind energy, legitimate concerns have been raised by the Royal Society for the Conservation of Nature and the Ministry of Environment in terms of possible impacts on wild birds, particularly soaring birds. This is due to the proximity of a few sites to Important Bird Areas, including Dana Nature Reserve which harbors the most important populations of breeding raptors and other threatened bird species in Jordan, and because most of the sites are very close to the escarpment / edge of the higher rift margins, which is a major route for migratory soaring birds. and where the air space may be used frequently by resident and breeding raptors. A major UNDP transnational programme "Mainstreaming Conservation of Migratory Soaring Birds into Key Productive Sectors along the Rift Valley/Red Sea flyway" identified key potential threats along this migratory flyway, and requires contracting parties to take action to assess and mitigate any conflicts that may arise .

The main problem is the lack of accurate information about numbers and behavior of large soaring birds, either migrating or breeding in Jordan, which are known to be prone to collisions with wind turbines. Moreover, wind farms are rather unusual in the Middle East, and studies on their impacts on birds and other wildlife in this region are thus absent. The Ministry of Environment has requested bird surveys to be carried out in some of the sites particularly during the migration seasons as part of Environment Impact Assessments, or at least to provide guidance to the Ministry of Energy and bidding companies when submitting their proposals. Such surveys are supposed to allow the early consideration of potential impacts on wild bird populations, and help inform an assessment of environmental risks related to the proposals .

A wind farm can have significant impacts on populations of migratory raptor species if located within a migration bottleneck. It is well known that large numbers of migratory raptors pass through southwest Jordan during spring and autumn migration; however, there is a lack of quantitative data in general and specifically at the selected sites .

Initial studies on the potential impacts on birds have been carried out to date in up to three sites covering mainly parts of the migration seasons. The detailed results have not been published yet, but one of the reports of an initial study near Dana Reserve showed that significant numbers of soaring birds do pass over the general area surrounding Dana Reserve at risk height (i.e. at height of rotors) especially during spring migration; moreover the air space near the escarpment is most heavily used by both migratory and resident soaring raptors. and wind turbines close to the escarpment are likely to have the largest impact on such soaring birds. Some areas near the escarpment were shown to be productive habitats with a high density of prey for raptors; these were thus visited more often by the resident and summer- visiting raptor species, including Lesser Kestrel *Falco naumanni*. Overgrazed areas have usually lower productivity and are thus less attractive for feeding raptors. Collision risk is assumed to decrease gradually in spring towards the east / at a distance of 500 m from the escarpment / top of the rift valley as large migratory birds heading northeast in spring gain height while soaring over the mountain plateau .

Wind farm developments in Jordan are considered to be a major threat to birds because (1) the proposed sites are mainly on the top of the escarpment / on the plateaus and slopes above the rift margins, and thus within a major flyway for migratory birds and within the airspace used by resident and summer-breeding birds of prey, and (2) the assessment process is still undeveloped in Jordan. Regulations governing the extent and quality of data and data analysis required for assessing the impacts of wind farms on birds do not officially exist. Instead of regulations, guidelines have been proposed by RSCN which are not binding and not officially adopted by the Ministry of Environment. These guidelines do provide minimum requirements for the process of assessing the impacts. However, the assessment process appears to vary among different sites and some aspects have not been considered in the guidelines, e.g. the importance of studying nocturnal migration and the use of the site by resident species throughout the year.



Honey Buzzard
© Rula Zein-iddin



Night Heron
© Nashat Hamidan



Teal
© Sameh Odeh

RESPONSE

The importance of monitoring: the National Waterbird Census

The Royal Society for the Conservation of Nature (RSCN) has been coordinating waterbird monitoring since 2001. This National Waterbird Census is part of a worldwide initiative coordinated by Wetlands International. In the beginning, the counts were carried out at 22 sites on a monthly basis from October to March. Originally, the objective of these counts was to assess the status of 'hunnable' species in the country. The plan was to carry out monitoring for only two years, and a report was produced based on the findings of those two years. In 2003, the census was not carried out but, later that year, RSCN decided, starting from January 2004, to adopt the census as a tool to assess the status of waterbirds and wetlands in the country for conservation purposes on an annual basis.

Site selection for the census has gone through several stages. From the first list of 22 sites that was visited in the first two years, some sites were dropped since the data collected from them proved that they were not as significant as was expected for waterbirds. On the other hand, other sites were proposed and consequently were added. Today 13 sites are regularly monitored.

Similar to any waterbird census in the world, the method used is direct counts where vantage points are selected, from which all waterbird species are recorded and their individuals counted. Since most of the sites are seasonal, or at least changeable in size based on the availability of water, points of counting are sometimes changed so that a better coverage of the site can be achieved.

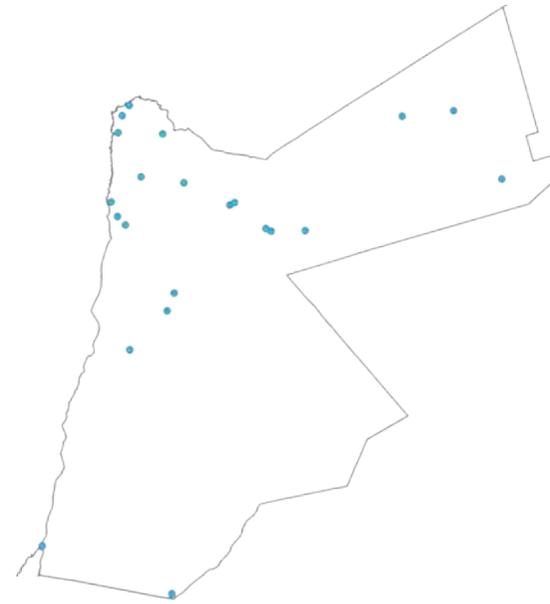


King Talal Dam
© koji kawai



When the waterbird census first started in 2001, the team of counters consisted of at least three people: two Jordanian researchers and one expert volunteer who led the monitoring and also built the capacity of the Jordanians in waterbird species identification. During the first census, a total of four Jordanian researchers took part in the counts accompanied each month by a different expert, from October until March. This provided the local researchers with an ever enriching amount of knowledge collected in a relatively short time and from more than one resource person .

Most of the experts who joined these first counts were from the Royal Society for the Protection of Birds (RSPB, the BirdLife Partner in the UK). This cooperation proved to be very successful and is continuous today.



Map 1: The location of study sites

Over the years, the team of counters in the census has expanded to include not just RSCN researchers but also local volunteers who are willing to help by providing some of their free time to cover sites. The waterbird census is coordinated by a national coordinator, who also takes part in the census. So, instead of needing more than a week to cover all target sites through a small team of researchers, as was the case in the early years of the census, currently all sites are visited over a single weekend. This represents a huge achievement and, during the period 2001 to 2013, nearly 50,000 waterbirds have been recorded from Jordan in January (see Figure 1).

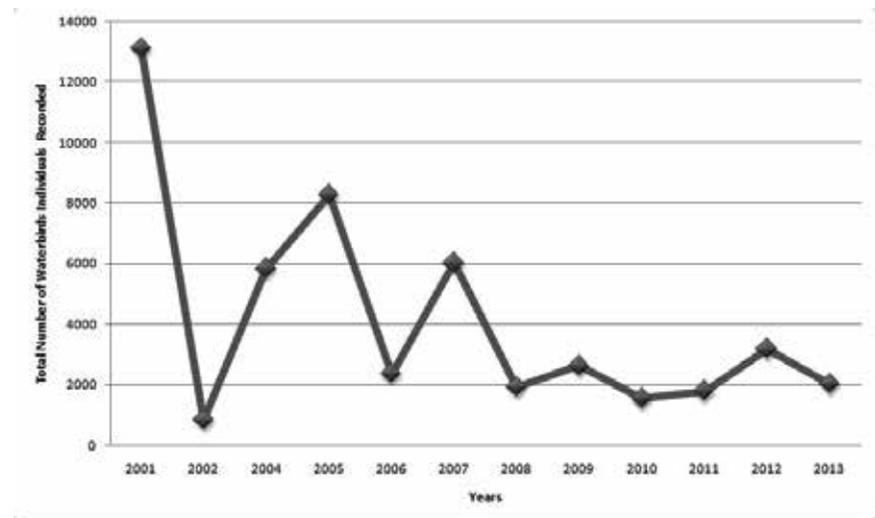


Figure: Number of birds individuals recorded over the study period. The fluctuation of the number of birds recorded is directly linked to precipitation

Waterbird abundance in sites



The number of waterbirds counted in midwinter counts depends directly on the abundance of water at the key sites and consequently depends on precipitation and flooding of the sites. Up until the latest counts of 2013, the first counts of the waterbird census in Jordan of the year 2001 still hold the highest record of waterbirds in the country. The good amount of precipitation that year led to the complete flooding of Qa Azraq, which has not been repeated since then. Another factor that influences the numbers of waterbirds recorded at sites is the timing of precipitation throughout autumn and winter. Normally, if rainfall arrives early in the season and consistently throughout until January, the number of birds and species would be .

If there is one thing that the data prove, it is the significance of Qa Azraq for waterbirds in general. Before the excessive pumping of water from the Azraq Aquifer, Azraq Qa used to flood more 'easily' since all waters that were in excess of the oasis used to flood to it. This is not the case these days since most of the water that comes flushing from wadis into the oasis flows down to fill the underground aquifer and less water is fed from the oasis into the Qa. Nevertheless, throughout the years of the waterbird census in the country, Azraq is still the site with the highest number of waterbirds counted, with more than 45% of the total .

Aqaba Bird Observatory



Aqaba Bird Observatory was established by the Aqaba Special Economic Zone Authority (ASEZA) in 1987 as a water treatment station for Aqaba city and over an area of 0.62 km² . The station aimed at providing treated water to be used for irrigation purposes to the public parks as well as to support the production of fertilizers by company based in Aqaba. The station is using two methods for water treatment, including natural treatment which has a capacity of 9,000 cubic meters and receives a total of 40% of Aqaba's sewage water. The second method receives 60% of Aqaba's sewage water and uses mechanical treatment which has a capacity of 12,000 cubic meters. The treated water is transferred to a large synthetic tank with a total capacity of 6,000 cubic meters.

Since its establishment, the site has attracted migratory bird species and hence it is managed by the Royal Society for the Conservation of Nature (RSCN) to both sustain populations of migrator birds and enhance its socio-economic development.

Since 2000, the site has been included in RSCN's annual national bird census program. Results showed a total of 103 bird species use the site, belonging to 29 families, including >80% of migratory species that occur in the country. The highest number of individuals recorded from the site was in 2001 with a total of 7,246, and the least was in 2010 with a total of 308. In addition, the results showed a sharp decline in bird numbers in 2002 with a total of 881 individuals. However, numbers rose again to reach 5,685 in 2004, but since then, a gradual decline has been reported to reach just 470 in 2011.



Pallas's Gull
© Sameh Odeh

The majority of birds species reported from the site over 2000 and 2011 belong to the family Anatidae with a total of 19,096 individuals representing 13 species. This was followed by the family Laridae (Gull) with a total of 6,517 individuals comprising eight species, and after that the family Rallidae (Rails) with a total of 3,895 birds representing two species, and lastly Alcedinidae was the least family with a single species recorded at the site.

Aqaba Bird Observatory, with 47 species and Karameh dam, with 46 species, are the most species rich sites in the country. Aqaba Bird Observatory represents one of the positive stories of waterbird conservation in the country. Since Jordan was identified as a key country for waterbirds in 1990s, there have been efforts to conserve the important sites for waterbirds in the country or at least try to influence their management. The site at Aqaba is the first to have a 'Bird Observatory' and its development is still ongoing, with the aim to attract birdwatchers from across the world and to raise awareness amongst Jordanians of the responsibility to conserve migratory waterbirds.

Contrastingly, Al Karameh Dam represents a unique story of water mismanagement that turned out to be of high benefit for waterbirds! The dam was constructed to use the water collected for irrigation in the Jordan Valley and as a permanent water source for livestock owners. After being constructed, the dam turned out to be a complete failure from a water management perspective since it is located on a saline substrate that would make the water unsuitable for agriculture, in addition to the fact that the dam collects large amounts of sediment, which would need high maintenance. Today the site has become a haven for waterbirds in the country.

Significant species recorded in the country

The waterbird census has helped to add several species to Jordan's bird list, both waterbirds and others. For example the Critically Endangered Siberian Crane *Leucogeranus leucogeranus*, which was recorded in Qa Khanna as a vagrant. Other special records of the census include the first records for European Golden Plover *Pluvialis apricaria*, Red Phalarope *Phalaropus lobatus*, Tundra Swan *Cygnus columbianus* and others.

As for the common species Shoveler *Anas clypeata* and Coot *Fulica atra* are by far the most common and widespread species recorded in the country with each species almost representing 10% of the total waterbirds counted from 2000 until 2013.



Golden Plover
© Koji Kawai

Priorities for conservation and degradation of some sites

The waterbird census was one of the very first efforts that expanded the focus of RSCN to carry out research outside protected areas. It has to be said that it is the positive willingness of RSCN that has kept this initiative ongoing, while funding it from in-house financial sources.

The waterbird census has repeatedly confirmed the biodiversity value of Azraq including Azraq Qa. Each year, the results show the significance of the site for waterbirds, but also repeatedly raises the alarm for the need of an urgent 'solution' for the water dilemma at the site.

Unfortunately, the waterbird census has documented the loss of one of the key seasonal wetlands in the country, namely Qa Khanna. This network of desert seasonal mudflats used to host highly significant numbers of waterbirds in winter and also during spring. Quarrying activities surrounding the site have led to road and track construction which, in turn, has led to dividing it into smaller water bodies and consequently has disrupted the linkages between the network of mudflats. The high disturbance caused by quarrying machinery and large vehicles has destroyed the value of the site for waterbirds. It should be mentioned that Qa Khanna was formerly proposed to be considered as the second Ramsar site of the country after Azraq. At the moment, this seems to be a long forgotten unreachable dream.

Vision for the future

The RSCN is proud of the data which it has generated and, recognizing the importance of continuing monitoring, has reaffirmed its willingness to continue its efforts in coordinating and leading the waterbird census. Volunteers are being increasingly encouraged to take part in the census in order to widen the base of birdwatchers in the country.

One of the major objectives of the waterbird census is to have it become one of the major tools to guide conservation efforts in the country's wetlands including unprotected ones such as Al Karameh Dam. After all, the census should be considered as a premier conservation tool that can help guide conservation efforts in the right direction.

Jabal Masuda-Jordan
© Ehab Eid



Common Tern
© Sameh Odeh

An alternative path for conservation - Special Conservation Areas

The Special Conservation Areas (SCAs), a new concept for Jordan, were created as a result of RSCN's Integrated Ecosystem Management in the Jordan Rift Valley project. SCAs are principally areas devoted for nature conservation through direct management by local communities. So far, there are seven SCAs recognized by the Rift Valley Master Plan, and the project intends to work on four of these sites to prepare community-centered conservation plans. Two of the selected sites are contiguous with protected areas and will act, in effect, as buffer zones.

Al Khayouf Special Conservation Area



Graceful Prinia
© Sameh Odeh

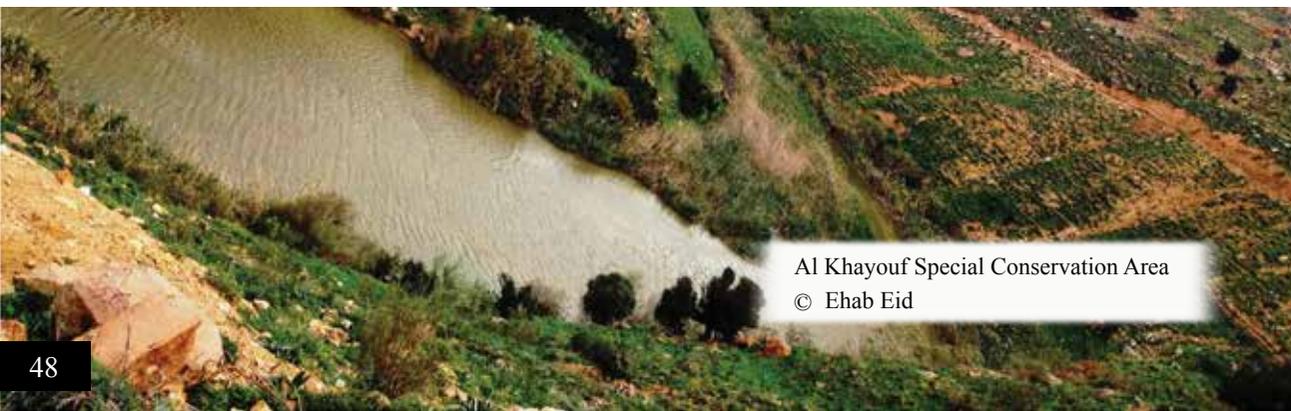
This SCA was established in 2010 over an area of 22.2 km² and aims to conserve a representative sample of wetlands in the Mediterranean bio-climate part of the country. It is located in the Jordan Rift Valley and is important for many migratory species, mainly waterbirds, such as Great White Egret *Egretta alba*, Great Cormorant *Phalacrocorax carbo* and Mallard *Anas platyrhynchos*.

Rahmeh Special Conservation Area



Hooded Wheatear
© Loay Al azzam

This SCA was established in 2011 within the Saharo-Arabian and Sudanian bio-geographical zones. It is situated over an area of 75.4 km² and aims to conserve a representative sample of the Sand dune vegetation type, where the dominant plant species is *Haloxylon persicum*. A total of 18 bird species has been recorded, including three with a limited range in the Middle East: Sand Partridge *Ammoperdix heyi*, Chukar *Alectoris chukar*, and Hooded Wheatear *Oenanthe monacha*. Rahmah SCA is considered one of the most unique sites in Jordan for the breeding of the globally Near Threatened species, Sooty Falcon *Falco concolor*.



Al Khayouf Special Conservation Area
© Ehab Eid



Rahmeh Special Conservation Area
© Ehab Eid

Al Shua'la Special Conservation Area



Little Owl
© Sameh Odeh

This SCA is still under establishment. It lies on the Al Yarmouk river edge with a total area 29.2 km², and has been established to conserve a representative sample of the Deciduous Oak vegetation type. Important records in the SCA include Griffon Vulture *Gyps fulvus* (a non-breeding resident) and Brown Fish Owl *Ketupa zeylonensis*.

Humret Mae'en Special Conservation Area

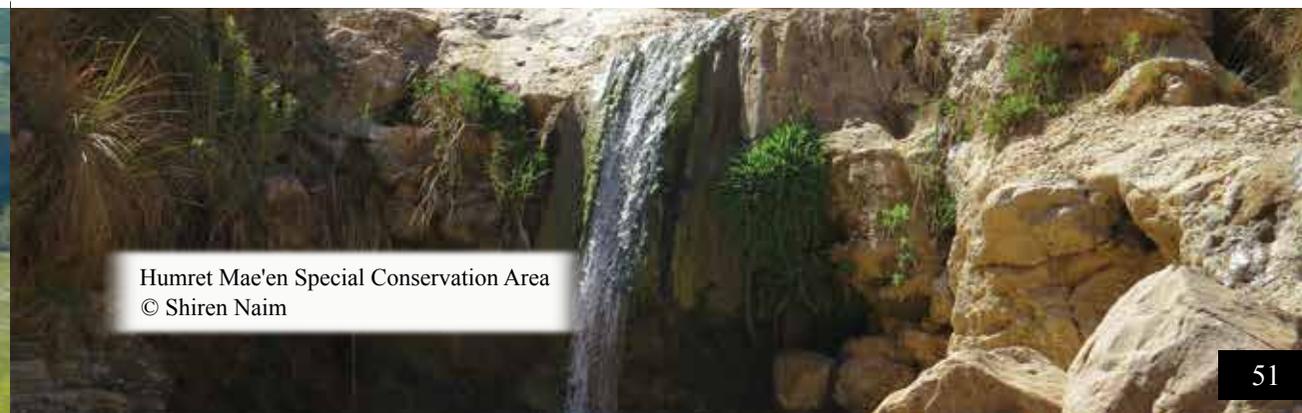


Chukar
© Ja'afar Alsnayan

This SCA is under establishment within the Tropical Sudanian and Irano-Turanean biogeographical zones. It covers an area of 62 km² to conserve a representative sample of aquatic vegetation types. Important records in the SCA included five breeding raptors: Short-toed Eagle *Circaetus gallicus*, Bonelli's Eagle; *Aquila fasciata*, Long-legged Buzzard *Buteo rufinus*, Kestrel *Falco tinnunculus* and Barbary Falcon *Falco pelegrinoides*.



Al Shua'la Special Conservation Area
© RSCN



Humret Mae'en Special Conservation Area
© Shiren Naim

Ibn Hammad Special Conservation Area



Roller
© Sameh Odeh

This SCA is under establishment within the Tropical Sudanian and Irano-Turanean bio-geographical zones. It covers an area of 64.5 km² to conserve a representative sample of aquatic vegetation types. The SCA is part of an Important Bird Area (IBA) with the same name. Important bird species recorded in the SCA include Lesser Kestrel *Falco naumanni*, Roller *Coracias garrulus* and Sand Partridge *Ammoperdix heyi*.

Tal Al Arbe'en Special Conservation Area



Spanish Sparrow
© Sameh Odeh

This SCA is under establishment within the Irano-Turanean bio-geographical zone. It covers an area of 0.181 km² to conserve the only representation of *Faidherbia albida* plant species in Jordan. It is located within the North Ghor Important Bird Area (IBA). Important records in the SCA include Black Francolin *Francolinus francolinus*.



Ibn Hammad Special Conservation Area
© Ehab Eid



Tal Al Arbe'en Special Conservation Area
© Thabit Alshare

Suwaymeh Special Conservation Area



Little Green Bee-eater
© Nashat Hamidan

This SCA is under establishment within the Tropical-Sudanian bio-geographical zone. It covers an area of 0.5 km to conserve a representative sample of the saline vegetation type that is dominated by several Tamarix species. It is located within the Sweimeh-Maghtas Important Bird Area (IBA). This SCA is important for migratory bird species, as well as for nationally threatened species, namely Black Francolin *Francolinus francolinus*, and a breeding population of Dead Sea Sparrow *Passer moabiticus*, which is restricted to Tamarix vegetation (it is threatened by the removal of this vegetation type all across the Dead Sea and the Jordan Valley for massive development projects).



Suwaymeh Special Conservation Area
© Ehab Eid

Laws, regulations and the establishment of an enforcement body

In 1966, His Majesty the late King Hussien approved the formation of the Royal Society for the Conservation of Nature (RSCN) whereby a hunting club formed its executive body. This club worked with the Minister of Agriculture to implement the hunting laws in Jordan along with police, forest guards and village heads (Arabic: mukhtars). The hunting club submitted an official proposal to the Government of Jordan “which was agreed in principle” to withdraw shotguns from Bedouins, shepherds and villagers. In addition, all hunting and shooting was forbidden without a license, which cost five dinars (\$8) a year in the 1960s (\$55 in 2013). In addition, the hunting club worked to prohibit the use of automatic weapons, nets, traps, mechanical vehicles and spotlights. Moreover, close seasons were adopted and bag limits were set for the open seasons and for all game (e.g., one wild boar and one ibex twice a year; 20 duck with shooting only two days a week on Fridays and Sundays, in the season of October to March). Furthermore, all hunting was prohibited in the desert region east of the Hedjaz railway except at Azraq. The penalties for breaking the law were severe, with withdrawal of licenses and confiscation of the firearms for a second offence. This enforcement of the hunting laws was continued by the RSCN hunting club until it changed its name to RSCN’s Wildlife and Enforcement section which acts as the management authority for the national implementation of the CITES convention .



Mujib
© RSCN Archive

To date, there are 18 laws and eight regulations in force relating to environmental protection. However, the main legislation covering the protection of birds and wild animals, hunting regulations, cooperation between different governmental agencies and competent authorities, assignment of responsibilities and powers of enforcement, allocation of financial resources and available funds, is the Aqaba Regional Authority Law No. 32 of 2000, Agricultural Law No. 44 of 2002, and the Environmental Protection Law No. 1 of 2003. In addition, there is an updated version of the Agricultural Law No. Z/2 of 2010 in accordance with article 57 of paragraph (a) of the Agricultural Law No. 44 for the year 2002, which also covers the protection of wild species.

Since enforcement of the law is a major concern for the Government of Jordan, a specific branch of the police force was created in 2006 (the Department of Police Environmental Directorate under the umbrella of the Ministry of Environment) which has direct support from the RSCN, aimed at protecting the environment from destruction through implementing national policies and tightening control over environmental violations. In 2008, and after His Majesty King “Abdullah II’s approval, this department has turned into the Environmental Police “Rangers.

The role of nature conservation and wildlife protection in Jordan is mainly divided between the Ministry of Agriculture and the Ministry of Environment. Hunting and trade of wildlife is a prime responsibility of the Ministry of Agriculture which has entered into agreement with the Royal Society for the Conservation of Nature, to which it delegated related responsibilities.

RSCN’s role in enforcement of wildlife legislations is quite a unique global case. It is very uncommon for an NGO to be given responsibility for establishing protected areas along with law enforcement responsibilities related to hunting and implementation of the CITES agreement.

Another major entity is the Royal Department for Environment Protection (RDEP, previously known as the Royal Rangers) which is a public security department operating as the executive arm for the implementation and enforcement of environment related legislations under the Public Security Directorate (PSD).

The Agriculture Law No. 44 of the year 2002 is the main pillar for wildlife protection in the country. Under this law, there are two bylaws that regulate bird and wildlife protection, hunting and trade, and categorises birds and wildlife that are banned from hunting according to their level of protection. There are several other relevant laws on environment protection, governing of ammunition and trapping equipment, and regulations on nature reserves and national parks, plus several bylaws.

Regarding Agriculture Law N. 44 of 2002, there are at least nine articles that directly deal with wildlife species. The articles set out all the details needed to manage, control and enforce wildlife protection in the country. These details include licensing for hunting and trade, areas of hunting, bag limits, hunting seasons, species allowed for trade and hunting and punishments in addition to others.



The wildlife committee formed by this law is responsible for setting the details of which species can be hunted and classifies the different species into several appendices depending on their conservation status.

Bylaw No. (43) for the year 2008 classified all bird species that are not allowed to be hunted in Jordan into three appendices based on their conservation status and abundance in the country. Annex 1 are the species with the highest significance and which are the top priority for conservation. The annex includes 36 species of birds such as Egyptian Vulture *Neophron percnopterus*, Pallid Harrier *Circus macrourus*, Imperial Eagle *Aquila heliaca*, Siberian Crane *Grus leucogeranus*, White-headed Duck *Oxyura leucocephala* and Syrian Serin *Serinus syriacus*.

Annex 2 includes 103 species of birds such Sooty Falcon *Falco concolor*, Short-toed Eagle *Circaetus gallicus* and Bittern *Botaurus stellaris*, while Annex 3 includes 134 species of birds such as White Stork *Ciconia ciconia*, Common Crane *Grus grus* and Great Crested Grebe *Podiceps cristatus*.

Enforcement of hunting related legislations is being implemented by the RSCN and the Royal Department for Environment Protection. Other organizations involved in the implementation of wildlife hunting and trade related legislations include the Ministry of Agriculture, Ministry of Foreign Affairs, the Army, Customs Department, Public security (other than the Royal Environment Protection Department), Petra Authority and ASEZA.

The Royal Department for Environment Protection was initially formed in 2006 as the Environmental Police. In 2008, the official name for the Royal Rangers was changed to "The Royal Department for Environment Protection". A memorandum of understanding was signed between the Ministry of the Environment with this department in 2008. All laws pertaining to the environment protection are assigned to the Royal Department for Environment Protection as a legal implementing agency. This Department is the primary or the major partner of RSCN's Wildlife Enforcement Section. Both parties signed a memorandum of understanding to implement and enforce laws and bylaws pertaining to wildlife protection in 2006. They also have delegation from the Minister of Agriculture to enforce article No. (51) of the Provisional Law of Agriculture No. (44) for the year 2002, and the Minister of the Environment to enforce and implement Law No. (52) for the year 2003 for the Environment Protection which was issued in 2006. Currently, joint patrols of the RSCN rangers and the Royal Rangers are operating.



Syrian Serin
© Masaru Amano

Multilateral Environmental Agreements

The Government of Jordan has ratified several international conventions in order to build on its efforts for protecting its biodiversity and natural resources in general. Multilateral Environmental Agreements are internationally important tools that can help in synchronizing various national efforts through a legalized system that promotes implementation and cooperation. Below is a brief look at the major MEAs that the government of Jordan has ratified throughout the years.

Ramsar Convention



The Convention on Wetlands of International Importance, referred to as the Ramsar Convention, was adopted in 1971. It is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The government of Jordan signed the convention in 1977. Azraq is currently the only Ramsar Site in Jordan.

CMS Convention



The Convention on the Conservation of Migratory Species of Wild Animals, also known as CMS or the Bonn Convention, is an intergovernmental treaty signed in 1979 and entered to force in 1983. It aims to conserve terrestrial, marine and avian migratory species throughout their range. The Government of Jordan joined this convention in 2001.

CITES Convention



The Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the CITES, was adopted in 1975. It aims to ensure that international trade in species of wild animals and plants does not threaten their survival. The Government of Jordan acceded to the Convention in 1978.

CBD Convention



The Convention on Biological Diversity is an intergovernmental treaty which entered into force in 1993. It has three main objectives of conservation of biological diversity, the sustainable use of the components of biological diversity and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Government of Jordan ratified the Convention in 1993.



Spotted Redshank
© Sameh Odeh

Case studies

Species-based Case Studies

Understanding the conservation needs of the Syrian Serin *Serinus syriacus*

Syrian Serin *Serinus syriacus* breeds in montane Lebanon, Syria and south-west Jordan, on rocky slopes with scattered trees and shrubs, and in open, rocky woodland. The species is globally threatened owing to the effects of drought, exacerbated by grazing pressure, wood-cutting and disturbance. In Jordan, the Dana Biosphere Reserve (an Important Bird Area) is a critical site for its survival, and surveys have been conducted there since 1995 by the Royal Society for the Conservation of Nature, in order to understand the best management strategy for the species.

Details

Syrian Serin *Serinus syriacus* is listed in the category ‘Vulnerable’ on the IUCN Red List of Threatened Species, owing to its small (<10,000 mature individuals) and decreasing population, and its status may be very critical in some of its range countries. It is also included on Appendix I of the Bonn Convention on Migratory Species. Due to its globally and locally threatened status, data on population trends and ecology is regularly needed for species and habitat management.

In south-west Jordan, the breeding range of Syrian Serin *Serinus syriacus* is restricted to the Dana Biosphere Reserve, where it lives at high altitudes between 950–1300m, in the Al- Barrah area. Dana has been designated as an Important Bird Area for the high diversity of breeding and migrant birds it harbors, and the presence of species with restricted ranges, including Syrian Serin.

During the first survey carried out in 1995 in the Dana Nature Reserve, the population size of Syrian Serin was estimated at around 800 pairs. In subsequent surveys, carried out in 1996–1997, a different method was used, and the breeding population was estimated at around 650 pairs, while in 1999 the breeding population apparently dropped to 500 pairs, which was probably related to severe drought during the late 1990s. In 2011, further research was carried out to assess the status of the breeding population of the species in the Dana Biosphere Reserve. The total population size was estimated to be in the range of 500–700 pairs. A small number (probably less than five pairs) may also breed between Al-Barrah and Dana Village.

In 2012, the research focused on defining the exact area of breeding habitat for Syrian Serin. The results of the study showed that nesting areas are restricted to just 2.4–2.7km² of the habitat originally defined as suitable (which had an area of almost 17km²). This information is critical for a new zoning plan for the reserve which considers the conservation needs for ‘core’ areas and patrolling.



Chicks belong to the Syrian Serin- Dana Reserve
© Loay Azzam

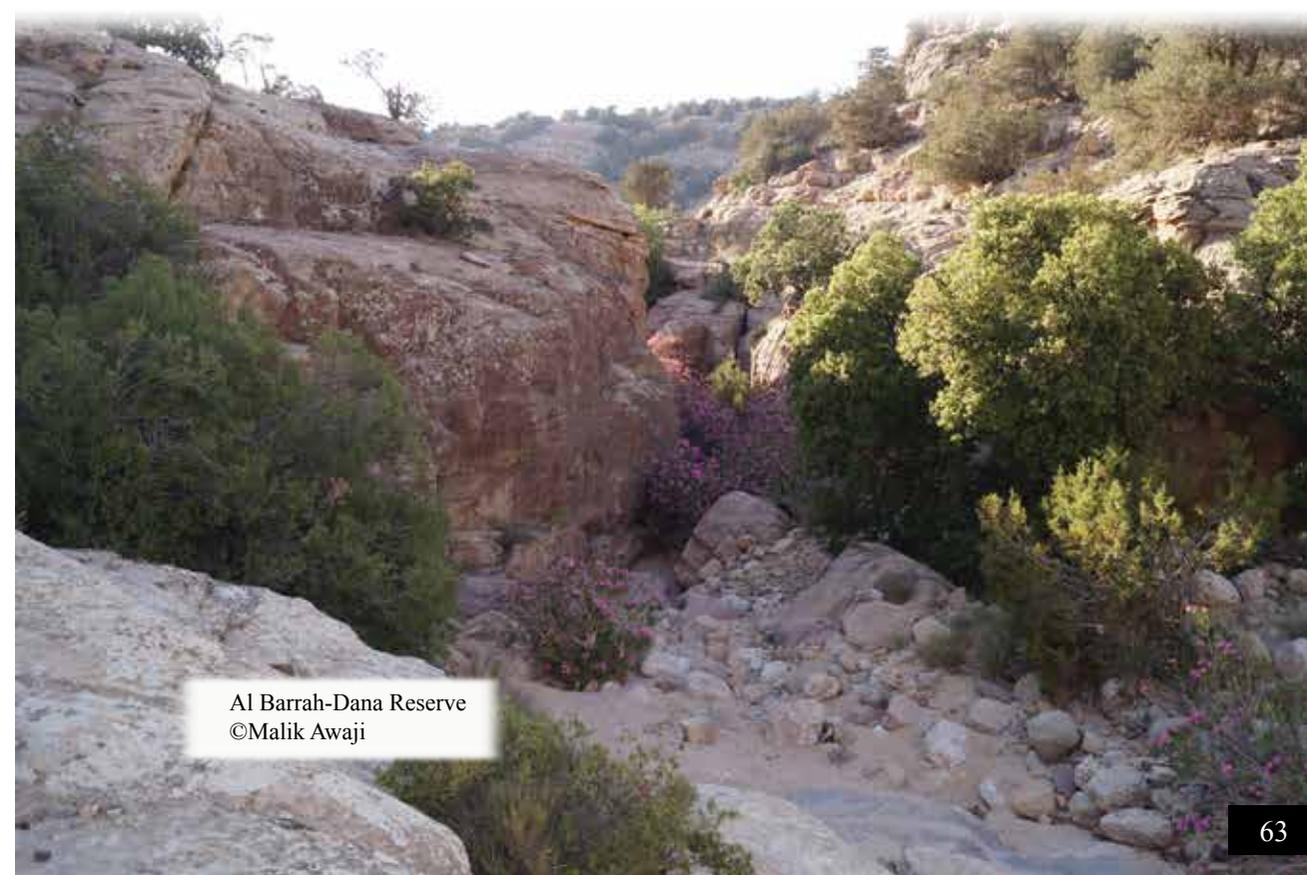
Year of study	Estimated Population size (pairs)	Estimated area of occupancy/spring (km ²)
1995-1996	800	16-17
1999	500	15
2011	500-700	14

It was clear during the recent surveys of 2011 and 2012 that threats to the Serin had increased due to uncontrolled activities and no site management. The area lacked a clear action plan due to the various stakeholders involved, including the local community, the Forestry department/Ministry of Agriculture and the RSCN.

From an ecological point of view, overall habitat degradation and disturbance are the main threats to Syrian Serin in the Dana Reserve. Oak trees are undergoing die-back, and irregular rainfall leading to long droughts is affecting annual plants, which are the main sources of food for the birds. On the other hand, grazing in winter may be useful for Syrian Serin, because open fields are kept clear from dwarf shrubs and are then suitable for the growth of annuals in the spring. However, overgrazing is leading to the destruction of the vegetation cover and soil erosion, and thus to the degradation of the breeding habitats. The number of livestock and period of grazing is apparently uncontrolled in Al-Barrah as herds are frequently observed later in spring, when grazing is not allowed.

Wood-cutting is also taking place by the herders who spend the winter with their families in Al-the Barrah woodland, mainly for fuelwood which is, according to them, the only source of energy for heating and cooking during winter. Moreover, many people from Al-Qadessiyah also use wood cut from the reserve for heating and use donkeys to transport the wood back to town. Another rising problem is uncontrolled picnicking and the recent increase of camping and grilling meat using the "Zarb" method which requires large amounts of wood. Hundreds, and sometimes over a thousand, picnickers per day come to Al-Barrah from the Tafila, al-Hassa and other areas during holidays. They enter the Al-Barrah woodland with their cars and make fires using wood cut off the trees. Significant areas of the breeding habitat of Syrian Serin are thus being disturbed particularly during the breeding season.

It is recommended that frequent surveys at the Dana Biosphere Reserve should be carried out as part of the overall monitoring program of Syrian Serin. This is important in view of the current drought, combined with the increase of anthropogenic impacts. Actions should be focused particularly on Al-Barrah in the coming years to try to stop the degradation of the important breeding habitats there. At the national level, there is a strong case for this bird species to be considered one of the highest conservation priorities in the country. The deterioration of its breeding habitats and the continuous decrease in its population is alarming. The status of the species in the rest of its distribution in the region is not well assessed, but it is thought not to be so different from the situation in Dana. If no strong and immediate action is taken, the Syrian Serin could well be on its way to extinction.



Al Barrah-Dana Reserve
©Malik Awaji

The status of breeding raptors in Jordan

The Jordanian bird list includes approximately 40 species of raptors including old records. Most of these species still use migration pathways in Jordan during the winter and/ or autumn, while others breed in the country. This rich diversity of species is threatened by human activities including collecting, shooting and poisoning, and action is urgently needed to maintain and recover populations.

Details

One of the most iconic breeding raptors in Jordan is Griffon Vulture *Gyps fulvus* which used to breed along the Rift Margin. Some colonies reached more than 100 nests according to Andrew (1995). Although this species is considered as 'Least Concern' on the IUCN Red List, numbers have declined in Jordan. Recent records include a few pairs in the Dana Biosphere Reserve (an Important Bird Area) where, in 1997 and 1999, there were a total of six pairs. In 2006 and 2010, 17 and nine active nests were located respectively. In 2008, a new colony was spotted by Mr. Yaman Al-Safadi in Wadi Namaleh close to Petra, estimated to be seven to 10 pairs. In 2012, the colony was double checked and birds were noticed at the site. A large breeding colony was also found in the northern part of the country on the Palestinian side. A few tagged vultures were found breeding at Dana in April 2010 and they are strongly believed to belong to the Golan Heights/Yarmouk River population .

Short-toed Eagle or Snake Eagle *Circaetus gallicus* is a large eagle that regularly used the Rift Margin in both summer and winter. It typically nests on trees, but is also found on cliffs, such as in the Mujib Biosphere Reserve and its surroundings. In Dana, a total of two to three pairs breed every year, while in Mujib a total of five breeding pairs were recorded in 2006, and one pair was nesting on an Oak Tree in Dibeen Forest Reserve in 2005 .

Long-legged Buzzard *Buteo rufinus* is the most common large breeding raptor in Jordan. It breeds along the Rift Margin and presumably in the eastern basalt desert. Three pairs were recorded breeding in Mujib in 2001, and one pair was also confirmed to breed in 2006. A few pairs were found breeding in Dana in 2010, and one pair was spotted breeding in Yarmouk in 2012. Chicks of this species are the most collected of any raptor from the nest due to the species' large size and noticeable nesting sites.

The magnificent Golden Eagle *Aquila chrysaetos* is a former breeder that used to breed in the eastern Desert. An abandoned nest, possibly that of a Golden Eagle, can still be seen close to Wadi Bayer. There are no recent breeding records, but yet it is still thought to breed in Jordan .



Lesser Kestrel
© Massaro Amano

A pair of African Verreaux's Eagles *Aquila verreauxii* was noticed in the Rum Desert in the 1980s. In 1990 an immature birds were seen with adults (Andrew 1995) confirming breeding. Sadly, in 2000, one individual was shot in Wadi Rum, and no further observation of the other bird has occurred since then. One pair was also found in the Dana Biosphere Reserve, and breeding was confirmed in 1999 in April, and a juvenile bird was spotted soaring in August of the same year suggesting breeding success. The species then disappeared for a considerable period of time, until it was observed again in 2010 by the RSCN breeding raptor survey team. Only one individual was observed and so pairing has not been confirmed since 1999.

Bonelli's Eagle *Aquila fasciata* breeds in small numbers along the Rift Margin especially in Humrat Maeen, and the Mujiband Dana Biosphere Reserves. Regularly, a minimum of two to three pairs breed annually in Mujib, and the same number, if not more, is estimated at Dana. One pair was well known to breed every year at the top of the Malagi area, where the two rivers (Mujib and Haidan) meet and flow west to the Dead Sea. At the time eco-tourism was introduced to the site and the Malagi trail became active, the pair left the nest, and since then the nest has been deserted .

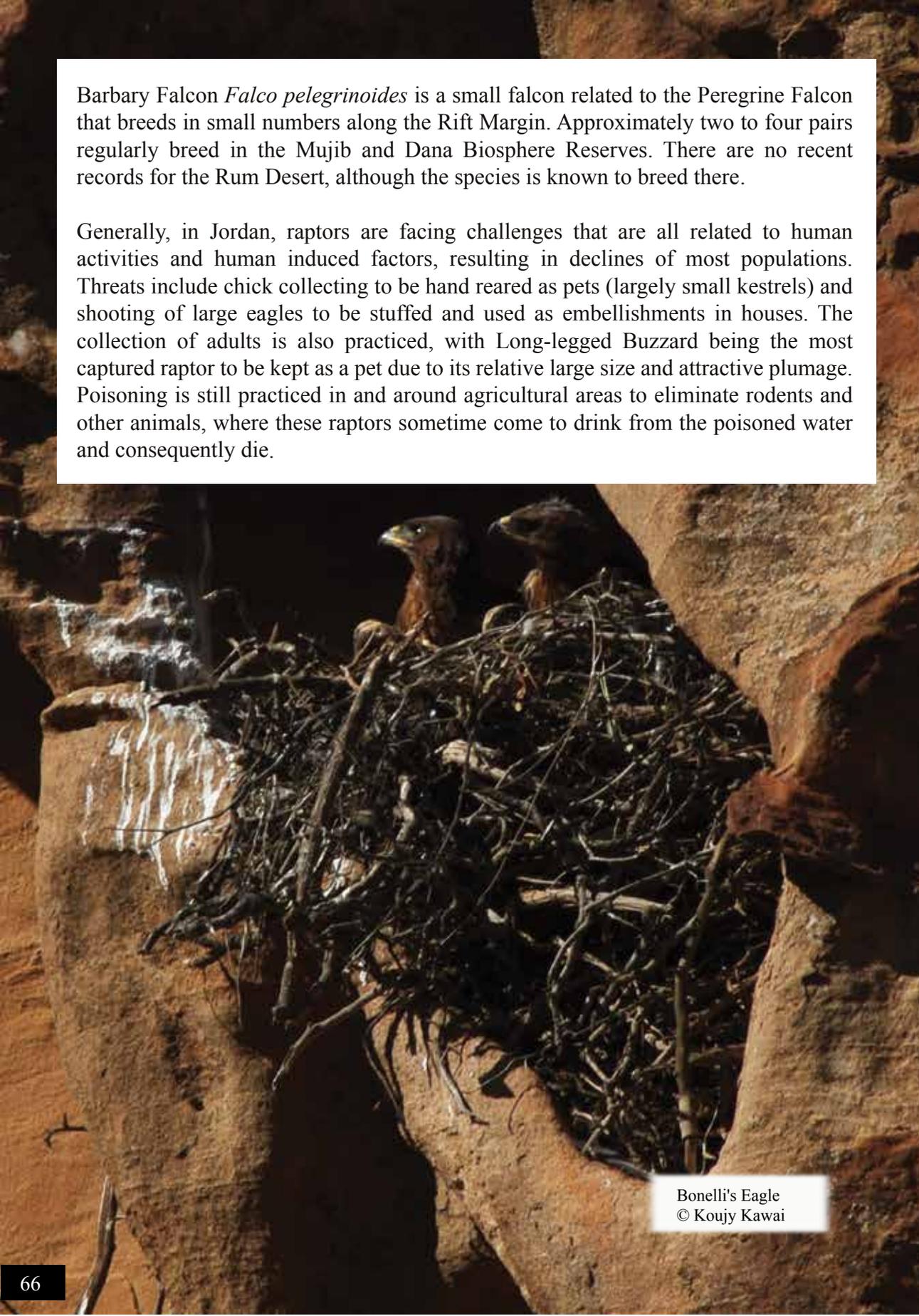
Common Kestrel *Falco tinnunculus* is the most common small raptor that breeds all over the country, and in all different habitats. It breeds in the cities on the minarets of mosques, high buildings, trees and cliffs. The chicks are usually vulnerable to collection, and among confiscated chicks, the chicks of this species are the most common .

Lesser Kestrel *Falco naumanni* is a social species that breeds in Jordan in low numbers. It is an uncommon summer visitor, and also spring passage migrant. The population of this species went through a dramatic decline in the past century because of habitat loss and it was considered globally threatened, classified as Vulnerable on the IUCN Red List. For example, the western European population declined by c.95% since the 1950s and the species disappeared from some countries in its distribution range, making the breeding population in Jordan of great importance. However, recently, its status has improved and population increased, and it is now considered Least Concern. The species can be used as an indicator of healthy habitats especially in its feeding areas. In Jordan, the first monitoring programme took place in Dana in 1995, and a total of 24–28 pairs were recorded. The monitoring programme was continued again in 1997, and 26–28 pairs were recorded. Monitoring has also taken place in the Mujib Biosphere Reserve. Surprisingly, the number of breeding pairs exceeded those recorded in Dana: 38 in 2001, 53 in 2005, 55 in 2006, and 33 in 2008. The decline in 2008 was due to the dry season when no crops were available on the feeding grounds. Additional counts, made by Mr. Shareef Al-Jbour from Birdlife in 2007, confirmed the breeding of 17 pairs in WadiShuaib, and there were recent observations of breeding activities in the high cliffs at Yarmouk Protected Area in 2012, but no counts took place. The total number of Jordanian breeding pairs is estimated not to exceed 200.

Sooty Falcon *Falco concolor* is a Middle Eastern specialist that breeds in Jordan in the southern sandstone of Wadi Rum. It breeds in October, and one pair was spotted in Wadi Rum during 2000, where the parents were seen training fledged chicks to hunt slow flying Rock Martin *Hirundo fuligula*. In Rahma species conservation area, 4–5 pairs were recorded breeding, but no breeding records have been confirmed in Dana or in Mujib .

Barbary Falcon *Falco pelegrinoides* is a small falcon related to the Peregrine Falcon that breeds in small numbers along the Rift Margin. Approximately two to four pairs regularly breed in the Mujib and Dana Biosphere Reserves. There are no recent records for the Rum Desert, although the species is known to breed there.

Generally, in Jordan, raptors are facing challenges that are all related to human activities and human induced factors, resulting in declines of most populations. Threats include chick collecting to be hand reared as pets (largely small kestrels) and shooting of large eagles to be stuffed and used as embellishments in houses. The collection of adults is also practiced, with Long-legged Buzzard being the most captured raptor to be kept as a pet due to its relative large size and attractive plumage. Poisoning is still practiced in and around agricultural areas to eliminate rodents and other animals, where these raptors sometime come to drink from the poisoned water and consequently die.

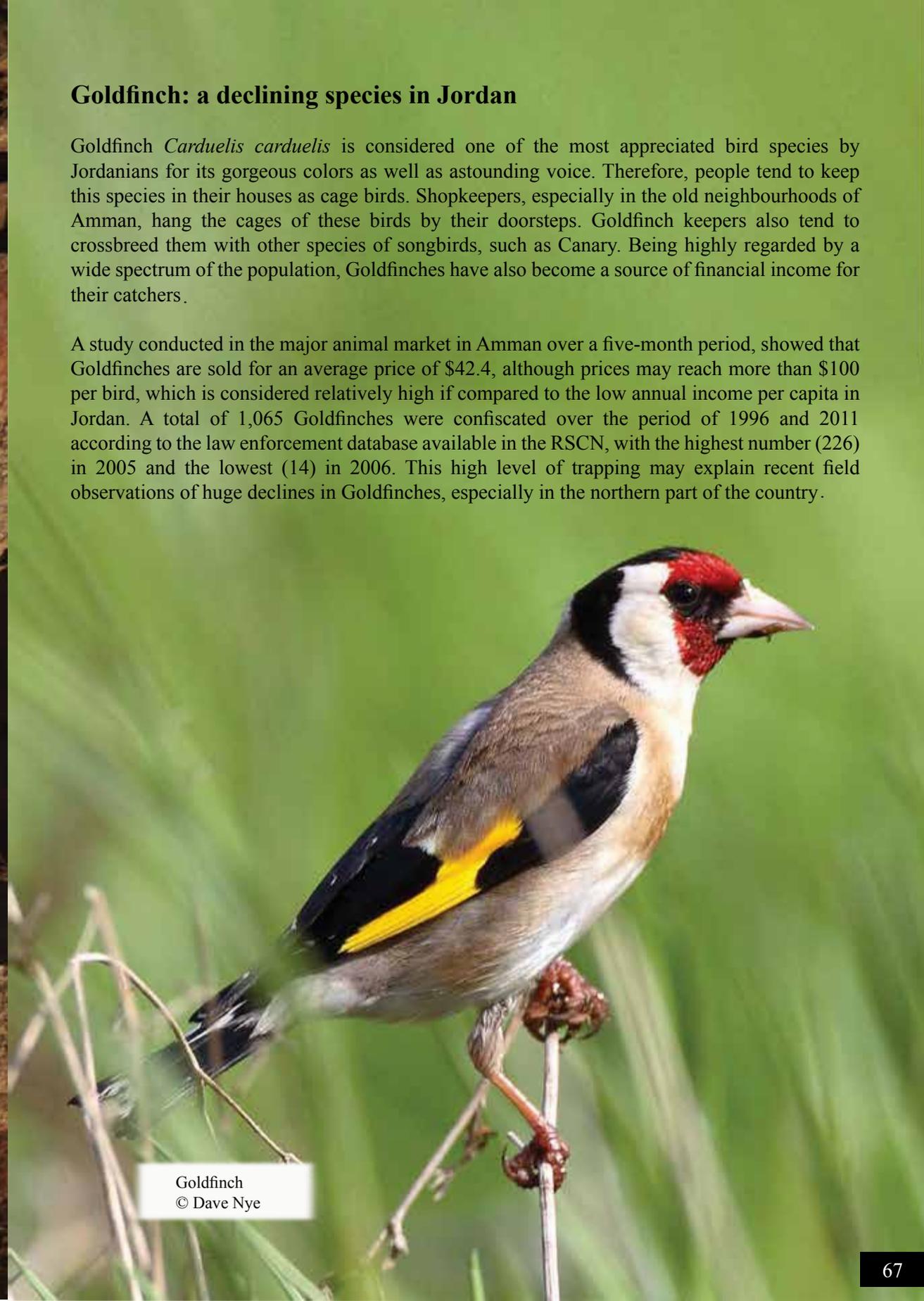


Bonelli's Eagle
© Koujy Kawai

Goldfinch: a declining species in Jordan

Goldfinch *Carduelis carduelis* is considered one of the most appreciated bird species by Jordanians for its gorgeous colors as well as astounding voice. Therefore, people tend to keep this species in their houses as cage birds. Shopkeepers, especially in the old neighbourhoods of Amman, hang the cages of these birds by their doorsteps. Goldfinch keepers also tend to crossbreed them with other species of songbirds, such as Canary. Being highly regarded by a wide spectrum of the population, Goldfinches have also become a source of financial income for their catchers.

A study conducted in the major animal market in Amman over a five-month period, showed that Goldfinches are sold for an average price of \$42.4, although prices may reach more than \$100 per bird, which is considered relatively high if compared to the low annual income per capita in Jordan. A total of 1,065 Goldfinches were confiscated over the period of 1996 and 2011 according to the law enforcement database available in the RSCN, with the highest number (226) in 2005 and the lowest (14) in 2006. This high level of trapping may explain recent field observations of huge declines in Goldfinches, especially in the northern part of the country.



Goldfinch
© Dave Nye

Site-based Case Studies

Azraq Wetland Reserve: a critical site for migratory birds

The Azraq wetland is an isolated oasis situated in the heart of the Jordanian desert at the junction of the basalt region to the north and the limestone-flint region to the south. Its location is of great significance for much fauna and flora, being the only wetland fed from ground water in the Arabian Desert. In particular, it is a critical site for migrant birds for resting, roosting, and nesting. However, the site has undergone dramatic changes because of water extraction and the once huge numbers of waterfowl are in decline. As a Ramsar site of international importance, effective management of the water resources is needed for both people and wildlife.

Details

Based on its importance, Azraq has received a lot of attention at the local, national, regional, and global levels. For example, it was the first site in an Arab country to be declared as a Ramsar site—the Azraq Wetland Reserve, a wetland of global importance because of its unique ecosystem, the endemic killifish *Aphanius sirhani* and the large number of breeding and migrant birds.



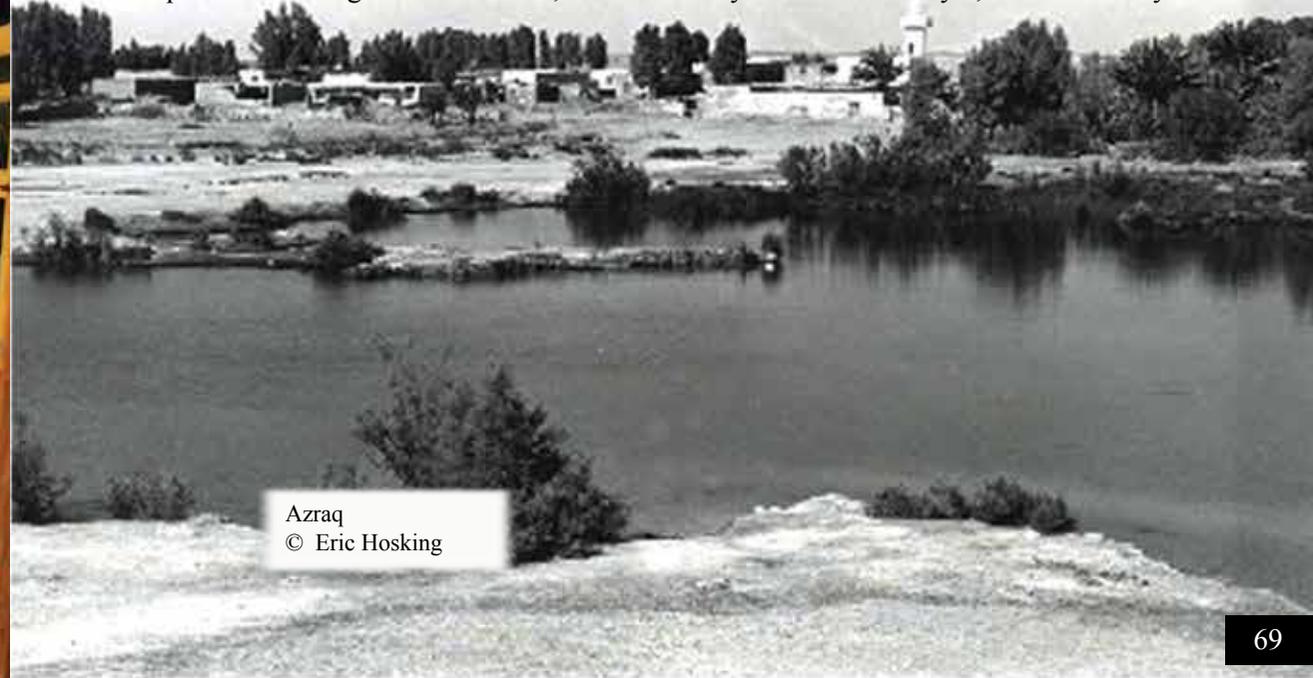
Azraq Wetlands Reserve
© Ehab Eid

The oasis used to cover an area of c.26 km² with a large mudflat located at the eastern edge known as Qa Al-Azraq. This mudflat, after receiving large amounts of rain water, forms a water body of c.74 km² and forms the border of the Ramsar site. It is the main attraction for birds which overwinter and breed there in large numbers, reaching up to one million individuals in some winters.

The oasis has undergone dramatic changes because of water extraction which started in the 1980s and ended owing to a complete drought in 1993. Since then rehabilitation programmes have taken place and are still trying to restore just 10 % of the original area. Although the bird list for the Azraq Wetland Reserve can reach up to 273 species in total, unsurprisingly, the number of recorded species in recent years has been declining. In 1973, Nelson recorded a total of 185 species compared to 149 in 1999 (Melling 1999), 144 species in 2000 and 160 species in 2004 (Ellis 2004).

In terms of breeding species, there have been rapid declines due to the loss of nesting grounds and high levels of disturbance. In 1973, 49 breeding species were reported, while currently there are less than five species that are regularly reported as breeding. In good rainy seasons, more birds return to breed, but still in low numbers. When it comes to wintering birds, especially for those key indicators like Northern Pintail *Anas acuta*, Eurasian Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Wigeon *Anas penelope*, Tufted Duck *Aythya fuligula*, Common Coot *Fulica atra*, Northern Shoveler *Anas clypeata*, Shelduck *Tadorna tadorna* and Ruddy Shelduck *Tadorna ferruginea*, the numbers have collapsed.

For example, huge numbers (c.100,000) of Northern Pintail *Anas acuta* were recorded at Azraq Qa'a in February 1967 when the Qa'a was completely flooded, forming a large playa. Subsequent counts have been much smaller number, with the highest number of 560 in December 2000 and 400 in February 1992, when the Qa'a was partially flooded. Teal *Anas crecca* is another example, when in February 1967 a total of 180,000 were counted, the highest number ever recorded at Azraq. The second highest count was 6,000 in February 1992 followed by 3,200 in February 2001.



Azraq
© Eric Hosking

Bird Monitoring in Azraq Oasis

Between 1999 and 2011, the Azraq Wetland reserve and Qa al Azraq were censused on six occasions during April by RSCN staff working with volunteer staff from the Royal Society for the Protection of Birds (RSPB, the BirdLife Partner in the UK). These studies were intended to record the migrant and breeding birds at Azraq, comparing the results between years and determining the effects of the programme of habitat management work.

In order to quantify the numbers and species of birds using the reserve in spring, surveys of the birds using different habitats within the reserve were carried out in 1999. The aim of these studies was to census the breeding and migrant birds on the wetland reserve and Qa al Azraq and to compare the results with previous studies.

During April in each of the relevant years, censuses of birds were carried out on the Azraq Wetland Reserve. In years when Qa al Azraq was flooded, censuses were also carried out of the mudflat habitat. Methods were broadly similar each year. Additionally, geographical positioning system (GPS) and satellite photographs were used to map several wetland breeding species along the different transects used during the monitoring programme.

Since 2004, the winters have been considerably drier. These dry conditions have had a considerable adverse effect on the dry ground habitats on the reserve (dry marsh, silt dune and qa). Between 2006 and 2010, there was so little rain in the winter that Qa al Azraq did not flood to any significant extent. Although these drier conditions have almost certainly resulted in a decline in the numbers of many of the breeding species on the reserve, the populations of Crested Lark *Galerida cristata* and Rufous Bush Robin *Cercotrichas galactotes* in the drier habitats and Graceful Warbler *Prinia gracilis* and Reed Warbler *Acrocephalus scirpaceus* in the wetland habitats have increased.

Due to the continuing dry conditions, the number of migrant birds feeding on the reserve and roosting in the reedbed declined. The exceptions were Chiffchaff *Phylloscopus collybita*, Woodchat Shrike *Lanius senator* and Red-rumped Swallow *Hirundo daurica* which increased on the reserve. In 2006, the most common migrant species that roosted in the reed bed, Sand Martin *Riparia riparia*, Barn Swallow *Hirundo rustica* and Yellow Wagtail *Motacilla flava*, declined considerably, although numbers remained much lower, but broadly stable up to 2011, due to the much drier conditions in the area.

In the wetland, the continued pumping of water, though proving politically difficult to continue at recent levels, largely maintained the quality of these habitats, which were further enhanced by a pool creation programme. The management of the flow of water to different areas of the wetland was very successful.

The unauthorised burning of the reed bed in 2009 and subsequent grazing by water buffalo reduced the amount of available tall reed habitat for Reed Warblers *Acrocephalus scirpaceus* in the reserve. Although Reed Warbler numbers declined substantially in this area, the number of singing males and apparent migrants on the reserve as a whole increased, probably because birds moved into the New Pools area. This indicates that the recent programme of pool creation on the wetland reserve has made the reserve better able to adapt to unforeseen changes. The reserve continues to provide an “island” of wetland habitat in the Eastern Desert that offers a safe haven for breeding and migratory birds.

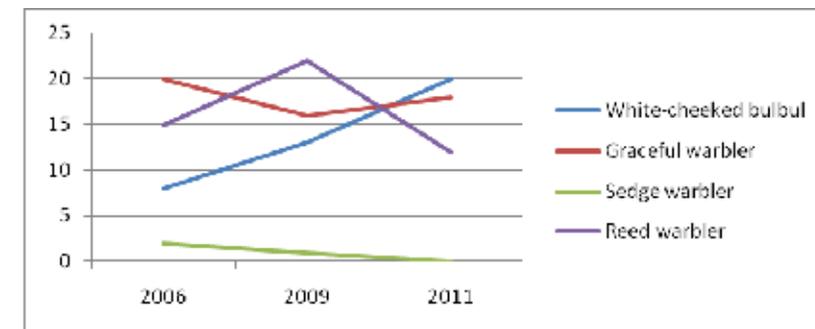


Figure 1. Total number of singing male white-cheeked bulbul *Pycnonotus leucogenys*, Graceful *Prinia gracilis*, Sedge Warbler *Acrocephalus schoenobaenus* and Reed Warbler *Acrocephalus scirpaceus* from the Boardwalk, Circular, New Pools and New Marsh Transects 2006 to 2011. Note the continuous increase in the numbers of the introduced White-cheeked Bulbul.



Chiffchaff
© Sameh Odeh

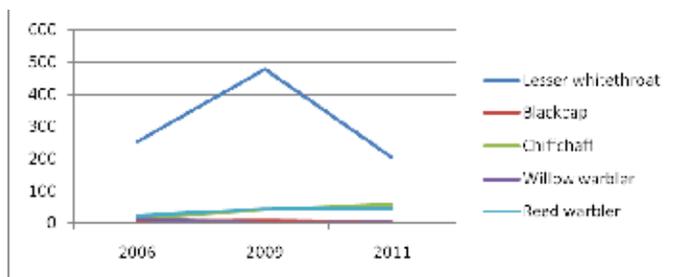


Figure 2. Mean number of migrant warblers on the Circular, Boardwalk, New Pools and New Marsh transects 2006-2011

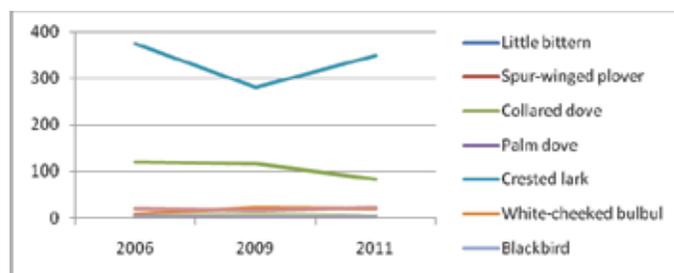


Figure 3. Estimates of the numbers of singing/displaying males of proved breeding species on the reserve in 2006, 2009 and 2011

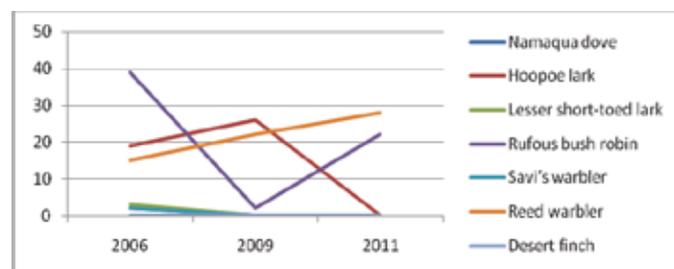


Figure 4. Estimates of the numbers of singing/displaying males of probable breeding species on the reserve in 2006, 2009 and 2011

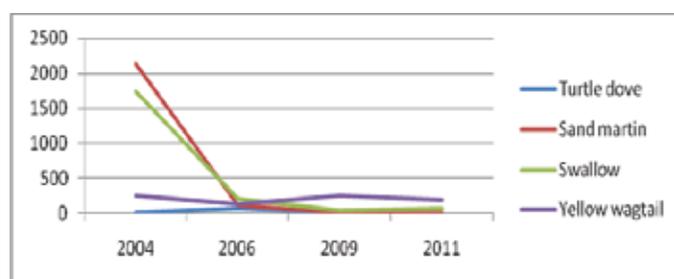
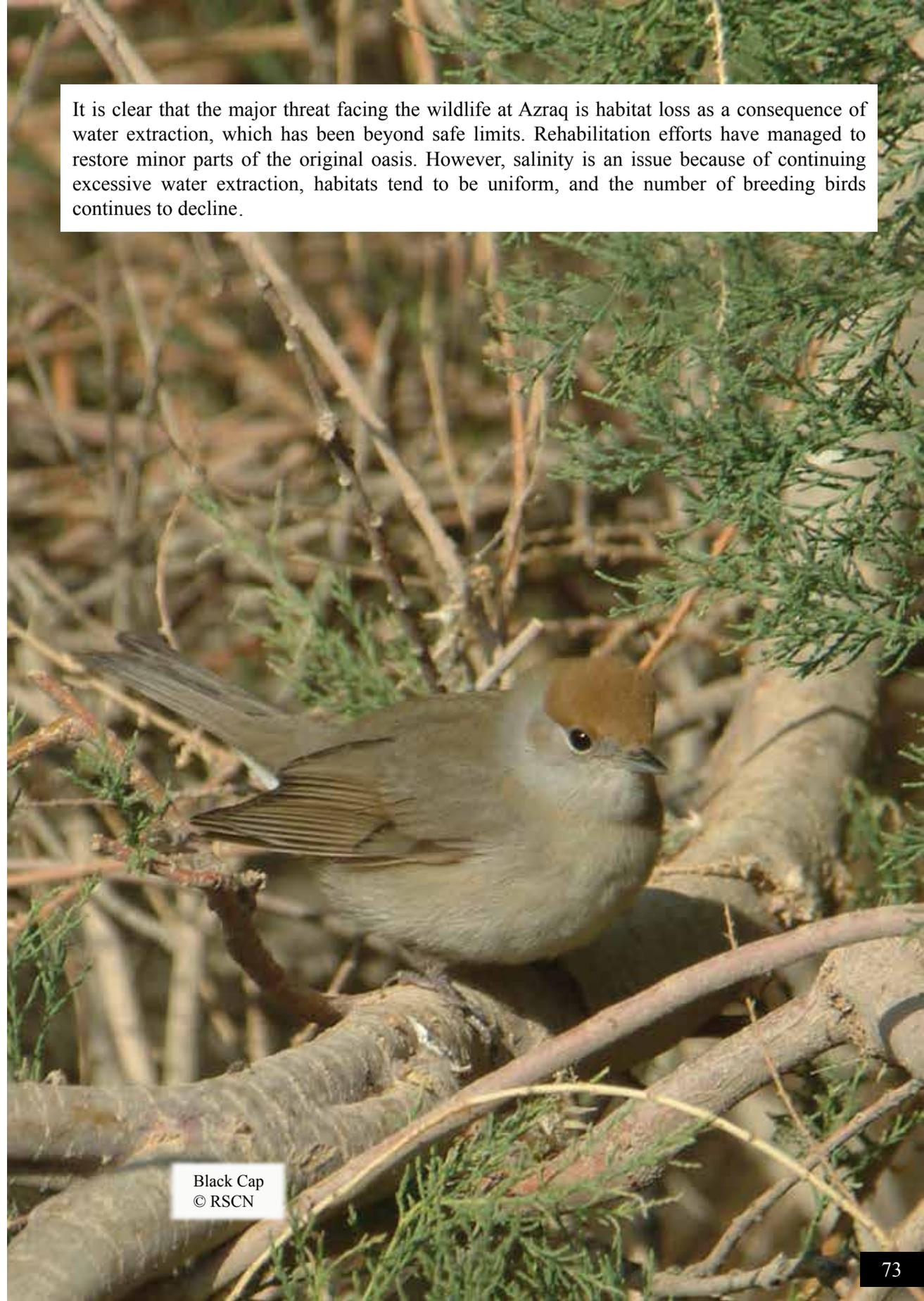


Figure 5. Trends in the mean counts of selected migrant species roosting in the reedbed to 2011 2004

It is clear that the major threat facing the wildlife at Azraq is habitat loss as a consequence of water extraction, which has been beyond safe limits. Rehabilitation efforts have managed to restore minor parts of the original oasis. However, salinity is an issue because of continuing excessive water extraction, habitats tend to be uniform, and the number of breeding birds continues to decline.



Black Cap
© RSCN

Raising awareness of the impacts of hunting on migratory soaring birds

RSCN is taking part in an important project that aims to take account of the conservation needs of migratory soaring birds across a number of different sectors. In Jordan, the focus is on hunting and, after much consultation, issues relating to law enforcement have been identified, and awareness and training initiated.

Details

In June 2011, the Royal Society for the Conservation of Nature (RSCN) joined a large UNDP/GEF project, specifically to carry out consultancy services related to the assessment of enforcement and implementation of wildlife protection laws in Jordan. This work is the national component of a regional project entitled “Mainstreaming Conservation of Migratory Soaring Birds into Key Productive Sectors along the Rift Valley/ Red Sea flyway”, involving other BirdLife Partners and governments within the region.

Within the past two years, several activities and workshops have been conducted by BirdLife International’s Middle East Office and the RSCN to promote awareness among different sectors of the Jordanian community and stakeholders. This has involved the participation of more than 60 judges from various governorates, to ensure that Laws and Bylaws related to the protection of soaring birds and other forms of wildlife are enforced. During these workshops, various case

studies involving hunting were presented, and the role of the RSCN and the Royal Department for Environment Protection discussed. Although there are many pieces of legislation dealing with protection of the environment, there are weaknesses in implementation due to many reasons including :

- The lack of awareness by the implementing agencies of the seriousness of environmental pollution and the resulting damage compared to damage caused by traditional crimes.
- The lack of awareness among judges on the application of the law based on “*the evidence in crime*”, when it comes to environmental pollution, which raises difficulties in both criminal and civil laws.
- Duplication of legislative texts governing the protection of the environment, thereby causing confusion.
- The different legislative regulations at the national level concerned with the protection of the environment, and the laws of the Aqaba Special Economic Zone and the laws applicable in the rest of the region.
- Inadequate penalties for environmental crimes such that they do not achieve the goals of deterrence or punishment.

As a result of these meetings, along with open discussions, it became obvious that there was an urgent need to build the capacity of judges and prosecutors on professional matters related to the environment and wildlife protection. RSCN now has the objective of helping judges understand issues related to wildlife hunting and protection through the implementation of an integrated training program. The ultimate goal is to support the establishment of special chambers in the courts dedicated/specialized in environmental litigation, both criminal and civil, through equipping a number of judges and prosecutors in the different governorates with the necessary information .

Over the past two years, the Migratory Soaring Bird Project has issued a number of publications in the form of a poster, a calendar, a booklet and a brochure to promote awareness among the different sectors of the Jordanian community, including all relevant agencies. A calendar depicting images for 12 soaring birds was released on the eve of 2011. For each month, an image of a soaring bird and information on its status and distribution was provided, with the message of protection and conservation. The calendar was distributed to governmental agencies, hunters, judges and the public sector.



Raising Awareness
© RSCN



Greater Flamingo
© Nashat Hamidan



Cream-coloured Courser
© Sameh Odeh



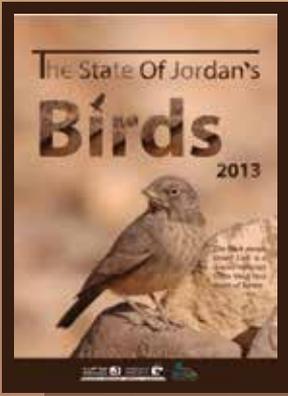
Bluethroat
© Sameh Odeh



Kingfisher
© Sameh Odeh



Spur-winged Lapwing
© Feras Rahahleh



About RSCN

The Royal Society for the Conservation of Nature (RSCN) is a Jordanian Non Governmental Organization (NGO), established in 1966 and devoted to the conservation of Jordanian biodiversity. RSCN has achieved international recognition for its pioneering attempts to integrate nature conservation with economic development, which, to date, have been focused on nine protected areas covering 1500 square kilometers of Jordan's most spectacular landscapes. Within these protected areas, the society has been conducting scientific research, establishing community-based programs to improve the livelihoods of local people, raising awareness of environmental issues and developing eco-tourism as a tool for conservation.

www.rscn.org.jo

About BirdLife International

BirdLife International is the world's largest nature conservation partnership. Together we are 121 BirdLife Partners worldwide—one per country or territory—and growing with almost 11 million supporters, 7,000 local conservation groups and 7,400 staff. BirdLife's vision is a world rich in biodiversity, where people and nature live in harmony. We are driven by our belief that local people, working for nature in their own places but connected nationally and internationally through our global Partnership, are the key to sustaining all life on this planet. This unique local-to-global approach delivers high impact and long-term conservation for the benefit of nature and people. BirdLife is widely recognised as the world leader in bird conservation. Rigorous science informed by practical feedback from projects on the ground in important sites and habitats enables us to implement successful conservation programmes for birds and all of nature.

www.birdlife.org

