Bird surveys in the St Katherine Protectorate, south Sinai, Egypt 2009

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Front cover photographs: top left – mountain pass from Sheikh Awad to St Katherine, top right – Wadi Hamier, bottom left – Wadi Baba, bottom right – pond at Wadi Gharandel.

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Contents

Executive Summary

In 2005 Operation Wallacea started a long-term agreement with BioMAP/Nature and Science Foundation Egypt with the primary aim to collate, survey and publish biodiversity records in Egypt. NSF aim to publish a status and distribution guide for the birds of Egypt in the next few years. Avifaunal surveys were conducted in and around the desert and mountains wadis of St Katherine Protectorate, south Sinai, Egypt, from the 14th July 2009 to the 10th August 2009. Overall 24 random stratified line transects of c2.5km length accounted for c30 hours, c69 minutes mean per transect. A total of 36 species of birds were recorded in surveys (24 expedition & 2 other surveys); around 25 species of resident breeding species were recorded. Wadi Gharandel contained the highest species diversity (16), as well as the highest total abundance of birds (188), closely followed by Wadi Baba (15) with the second highest total species abundance (85) and St Katherine (14). Wadi Eshgerah had the lowest diversity of species with only four White-crowned Wheatear *Oenanthe leucopyga* recorded. White-crowned Wheatear *Oenanthe leucopyga* were the most abundant species in surveys: 12.2% total number of birds followed by House Sparrow *Passer domesticus* (9.7%), Eurasian Collared Dove *Streptopelia decaoto* and Laughing Dove *Streptopelia senegalensis*; both had 9.2% total abundance. White-crowned Wheatear *Oenanthe leucopyga* had the widest distribution recorded in: 85% (17/20) wadis, followed by Scrub Warbler *Scotocerca inquieta* 70% (14/20) wadis and Rock Martin *Ptyonoprogne fuligula* 50% (10/20) wadis. There were notable new additions not recorded in BioMAP/Operation Wallacea surveys from 2005-2008 including: Black-crowned Night Heron *Nycticorax nycticorax*, Lesser Kestrel *Falco naumanni*, Barbary Falcon *Falco pelegrinoides* and Greater Short-toed Lark *Calandrella brachydactyla*. Only five birds of prey were recorded; four of those species were observed at Wadi Gharandel including: Common Kestrel *Falco tinnunculus*, Sooty Falcon *Falco concolor*, Barbary Falcon *Falco pelegrinoides* and Hume's Owl *Strix butleri*. Two Hume's Owl were visibly recorded in Wadi Baba, one was caught in a mist net. Large flocks of European Bee-eater *Merops apiaster* (20 adults) were recorded calling, perching and feeding in the gardens of Wadi Gharandel over the 16th and 17th July, possibly linked to a rare breeding colony. Several species of migrant warblers were recorded on early stop-over including: Reed Warbler *Acrocephalus scirpaceus*, Eastern Olivaceous Warbler *Iduna pallida*, Olive-tree Warbler *Hippolais olivetorum*, Lesser Whitethroat *Sylvia curruca* and Eastern Orphean Warbler *Sylvia hortensis*. Three resident breeding species of wheatears were again recorded on expedition including: Mourning Wheatear *Oenanthe lugens*, White-crowned Wheatear *Oenanthe leucopyga* and Hooded Wheatear *Oenanthe monacha*. The St Katherine Protectorate is an important area for both resident and migratory birds and requires ongoing protection from overgrazing and hunting, effective conservation management and further studies in ecological research.

Introduction

This report presents the preliminary results for bird survey research in and around the south Sinai Peninsula, St Katherine Protectorate, Egypt, in July and August 2009.

Starting from 2005 St Katherine Protectorate Important Bird Area (IBA) is the continuing focus of research directed by the Nature and Science Foundation Egypt (www.naturescienceeg.org) in collaboration with Operation Wallacea (www.opwall.com). The main aim of this research project is to map biodiversity in and around the St Katherine Protectorate, south Sinai; including taxa such as plants, birds, reptiles and mammals. A grid atlas of approximately 100 squares 10km x 10km has been positioned over the St Katherine Protectorate for surveys to be conducted.

Located where the Asian and African continents meet, the Sinai Peninsula is a distinctive biological region with characteristic flora and fauna (Zalat *et al* 2001). A large part of southern Sinai was given protected status in 1996 through the St Katherine Protectorate, established by the Egyptian Environmental Affairs Agency (EEAA). Birdlife International has given the Protectorate Important Bird Area (IBA) status. Resident bird communities include Egypt's Sahara-Sindian biome-restricted species, with many of these species uncommon or not represented in other IBA's in Egypt (BirdLife 2005, White *et al* 2008). Goodman *et al* (1989) reported around 50 resident species of breeding birds in the area including species such as: Sinai Rosefinch *Carpodacus synoicus* and Tristram's Starling *Onychognathus tristramii*.

Southern Sinai has a predominantly mountainous environment consisting of drainage systems made up of a number of inter-connected wadis (ephemeral river beds). Geologically the peninsula is split into three sections: the northern sand dunes, a central limestone plateau, and high altitude igneous rock mountains in the south. Southern Sinai lies in the north African belt and has a Saharan-Mediterranean climate. Summers are hot, with a mean temperature of 36°C (August) and winters are cool with a mean minimum temperature of 7.8°C (February), (Grainger 2003).

The area has an arid climate with a mean annual rainfall of 60 mm/year; with the addition of snow melt on higher mountain peaks which can receive around 300mm/year (Grainger 2003). Bedouin tribes have inhabited the mountains of southern Sinai for hundreds of years using the land for camels, goats, sheep and tending gardens with fruit and olive trees in various wadis. The natural resource base and cultural heritage are now at risk from significant development pressures (BirdLife 2005).

Birds in the St Katherine Protectorate are threatened by overgrazing of wadi habitats and recent shifts from traditional Bedouin gardens to illegal cannabis plantations. Diurnal raptors in particular face the threat of trapping for use in falconry and persecution by residents who consider them agricultural pests. Hunting has been banned in the St Katherine Protectorate but illegal hunting persists, and larger species such as the Sinai Leopard *Panthera pardus jarvisi* have been hunted to extinction while the Nubian Ibex *Capra nubiana* is rare and threatened. The tourism industry in the form of coastal resorts such as Sharm El Sheikh is one of the fastest growing in the world and increasing numbers of people are visiting the historical sites in St

Katherine. Grainger (2003) stated there is an average of 700 tourists per day to St Katherine's Monastery, which has detrimental effects on the local environment, especially water resources.

The St Katherine Protectorate is an important area for both resident and migratory birds and requires ongoing protection, effective conservation management and further studies in ecological research.

Study Areas

Survey Areas 2009

Bird survey expeditions were conducted between July 14th and August 10th 2009 led by Matthew White (RSPB/Operation Wallacea/Nature and Science Foundation Egypt) and Salma Zalat (Nature and Science Foundation Egypt/Operation Wallacea). Transects were repeat surveyed in St Katherine including: Nuweiba Road, St Katherine Monastery and Wadi Arbaein.

Expedition Survey Schedule

Wadi Gharandel	16/07/09 - 17/07/09
Wadi Baba	17/07/09 - 19/07/09
Wadi Seih	19/07/09, 23/07/09
Wadi Foqa	20/07/2009
Wadi Hamier	21/07/2009
Wadi Karanc	21/07/2009
Wadi Tayiba	22/07/2009
Wadi Barag	22/07/2009
Wadi Gharba (Sheikh Awad)	23/07/09 - 24/07/09
Camp site and route to coloured mountain	05/08/09 - 06/08/09
Wadi Sanad	06/08/2009
Wadi Eshgerah	07/08/2009
Wadi Degayeg	07/08/2009
Wadi Hammami	08/08/2009
Wadi Zaraneig	08/08/2009
Wadi Nafkh	09/08/2009
Wadi Makhrouga	09/08/2009
Wadi Fara'	10/08/2009

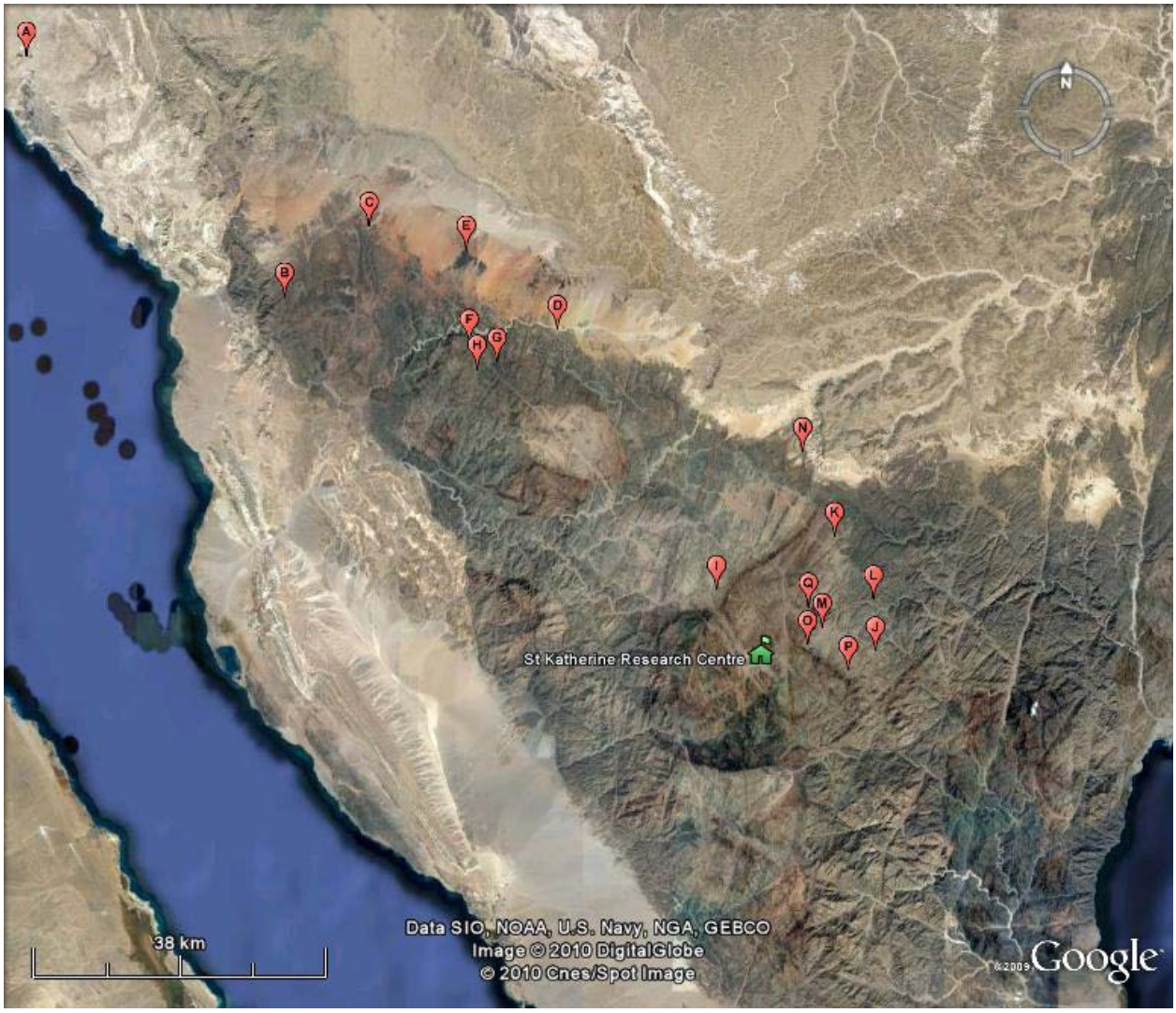

Figure 1. St Katherine Protectorate survey sites, south Sinai, Egypt 2009

Key: Survey area: A = Wadi Gharandel, B = Wadi Baba, C = Wadi Sieh, D = Wadi Foqa, E = Wadi Hamier, F = Wadi Karanc, G = Wadi Barag, H = Wadi Tayiba, I = Wadi Gharba, J = Wadi Sanad, K = Wadi Eshgerah, L = Wadi Degayeg, M = Wadi Hammami, N = Wadi Zaraneig, O = Wadi Nafkh, P = Wadi Makhrouga, Q = Wadi Fara'

Wadi Survey Site Descriptions

St Katherine - Nuweiba Road (c1500m asl)

St Katherine – Nuweiba Road is a large open heavily disturbed wadi with patchy low-level scrub vegetation and high granite mountains rising either side. Nuweiba Road contains the only main road out of St Katherine heading north-east to the coastal town of Nuweiba. There are several settlements on the side of Nuweiba Road in St Katherine where gardens are tended and livestock (camels, goats) are housed and fed attracting various species of birds. St Katherine Protectorate Visitor Centre and gravel car park are located in the right of this picture.

Plate 1. Nuweiba Road (St Katherine) 2009 © Matthew White

St Katherine Monastery (c1500m asl)

Located in Wadi El Deir St Katherine Monastery is site of international religious importance and heavily disturbed wadi. The resident monks of St Katherine Monastery have cultivated and tended fruit and vegetable gardens for centuries and the monastery gardens attract high densities of birds (White *et al* 2007, 2008). The road and pathway leading in to the monastery from Nuweiba Road receive heavy vehicle, camel and human traffic; early most mornings hundreds of people walk from the car park to the monastery and Mount Sinai.

Plate 2. St Katherine Monastery gardens 2009 © Matthew White

Wadi Arbaein (1700 - 1900m asl)

Wadi Arbaein starts at Suez Canal University Research Centre, on the south side of St Katherine rising about 4 km through red granite boulders and high steep cliffs, ending at the garden of Deir El Arbaein. Wadi Arbaein has serveral well cultivated gardens containing cypress trees and fruit and vegetable gardens; there is human disturbance through the central path of the wadi, mostly in the late afternoon. In the winter the steep wadi sides receive snow melt from the high mountains replenishing wells, this was most recently documented in March 2009.

Plate 3. Wadi Arbaein © Matthew White

Wadi Gharandel (33 - 99 asl)

Wadi Gharandel is located on the mid-western coastal strip of the Sinai Peninsula. The site is a low altitude wadi system with several small settlements containing fruit and vegetables gardens, hardy sheep and goats. The central part of the wadi bed is flat and open with a sandy to gravel bed and low sandstone cliffs. Vegetation is sparse and consists of several concentrations of palm and tamarisk trees; there are also small pond areas with reeds acting as magnets for passerine migrants on stop-over.

Plate 4. Wadi Gharandel © Matthew White

Wadi Baba (223 - 344m asl)

Wadi Baba is a low altitude system located inland south-east of Wadi Gharandel. The system consists of several smaller interconnecting wadis with gravel beds and high rise sandstone cliffs either side. Vegetation consists of a mixture concentrated palms and isolated acacia trees with patchy low-level scrub. There is a small settlement keeping several, sheep, goats, camels and donkeys.

Plate 5. Wadi Baba © Matthew White

Wadi Sieh (455 - 522m asl)

Wadi Sieh is located further inland north-east of Wadi Baba; the wadi has a sandy bed with sandstone canyons rising either side. Vegetation mostly consists of patchy low-level dry scrub and there is also a small settlement with Bedouin gardens and livestock.

Plate 6. Wadi Sieh © Matthew White

Wadi Foqa (761 – 769m asl)

Wadi Foqa is a higher altitude wadi in north-east St Katherine Protectorate with a large open sandy and gravel plain with several sandstone canyons buffering either side. Again vegetation is patchy low-level scrub and a few isolated acacia trees. There is one small Bedouin settlement with tended gardens.

Plate 7. Wadi Foqa © Matthew White

Wadi Hamier (757 - 780m asl)

Wadi Hamier is a narrow small wadi located north-west of Wadi Foqa; the wadi bed consists of gravel and boulders with sand mixed in-between. There are several healthy acacia trees with a variety of small rare plants.

Plate 8. Wadi Hamier © Matthew White

Wadi Karanc (618 - 687m asl)

Wadi Karanc is a small wadi off the main Wadi Barag system; the rough wadi bed consists of a large range of boulders mixed with gravel and high cliffs buffering each side. There area several acacia trees mostly located at the wadi cliff sides with low-level scrub vegetation. At the lower end of the wadi there is a small Bedouin settlement with tended Bedouin gardens, livestock and a well.

Plate 9. Wadi Karanc © Matthew White

Wadi Tayiba (724 - 809m asl)

Wadi Tayiba is a small wadi off the main Wadi Barag system; the wadi bed consists mainly of coarse gravel to small boulders with cliffs each side. There are a relatively large number of healthy flowering acacia trees with patchy low-level scrub. Several flocks of tended goats were noted foraging under the acacias.

Plate 10. Wadi Tayiba © Matthew White

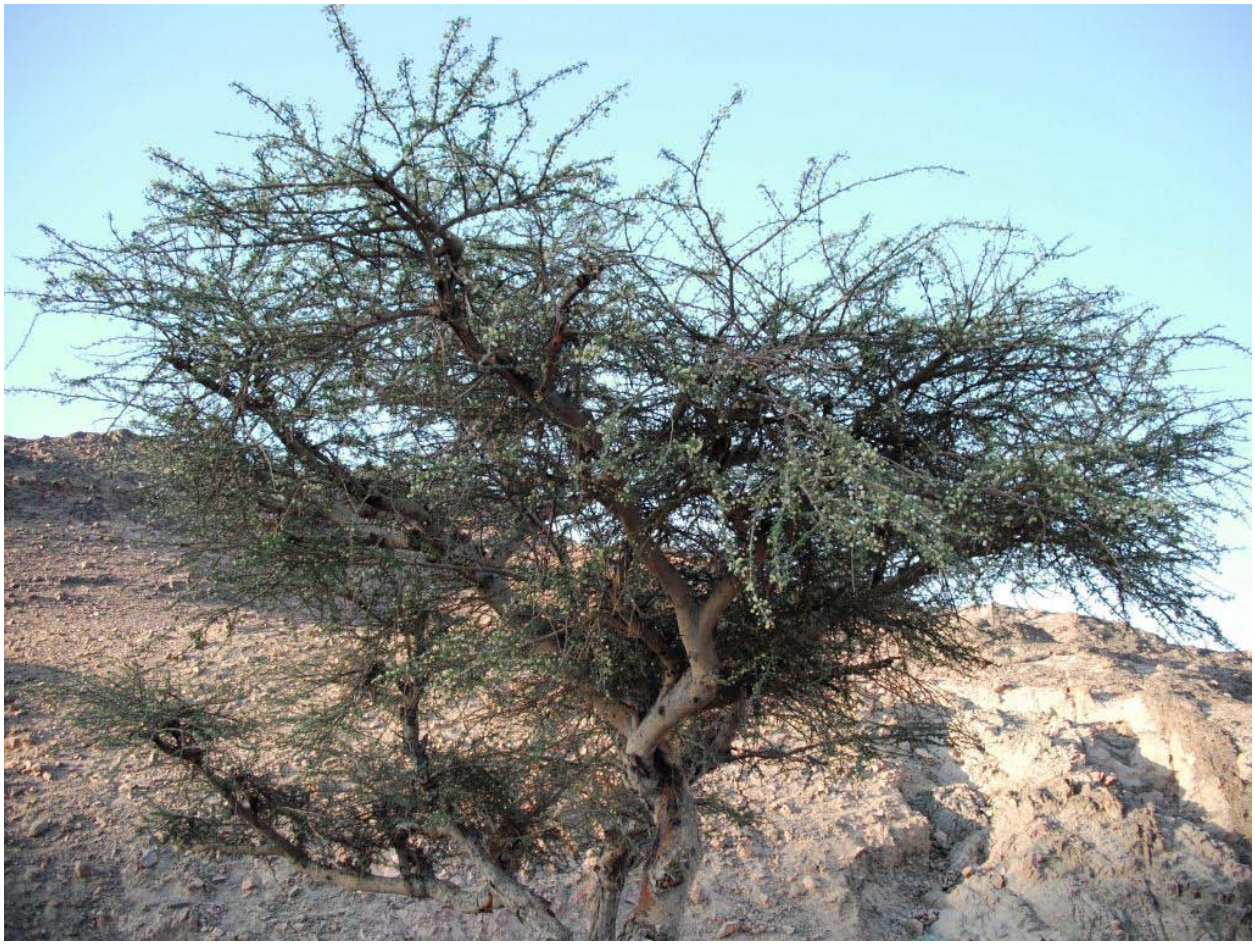

Plate 11. Flowering acacia Wadi Tayiba July 2009 © Matthew White

Wadi Barag (c766m asl)

Wadi Barag is a longer wadi system linked to Wadi Sieh to the north-west, inter-connected with several smaller wadis including: Wadi Karanc and Wadi Tayiba. The wadi bed consists of a mixture of coarse gravel to large boulders, buffered each side by rising mountains. There are several isolated acacia trees, low-level scrub vegetation and small Bedouin houses with gardens and livestock.

Plate 12. Wadi Barag © Matthew White

Wadi Gharba (1100 - 1127m asl)

Wadi Gharba is located just outside the Ring Dyke within three hours walking distance to the north of St Katherine. Notably there are a series of excavated underground wells that area used to irrigate flat sandy parts of the wadi bed, partly funded by the UNEP World Food Program. There are a variety of fruit trees and vegetables grown in Bedouin gardens. Al Karm Ecolodge also runs ecologically friendly accommodation for tourists visiting the area. In 2007 the Bedouin community stated there was less water in the wadi with possible detrimental effects to the local ecosystem, in 2009 the wadi appeared much drier.

Plate 13. Wadi Gharba © Matthew White

Second Expedition Wadi Survey Sites

A series of higher altitude mountain and wadi desert systems were surveyed east and north-east of St Katherine. These areas were generally very dry with sparse low-level scrub vegetation.

Route to coloured mountain (1278 – 1320m asl)

Plate 14. Route to Coloured Mountain © Salma Zalat

Wadi Eshgerah (1234 – 1272m asl)

Plate 15. Wadi Eshgerah © Salma Zalat

Wadi Degayeg (1160 – 1270m asl)

Plate 16. Wadi Degayeg © Salma Zalat

Wadi Hammami (1364 – 1444m asl)

Plate 17. Wadi Hammami © Salma Zalat

Wadi Zaraneig (1168 – 1229m asl)

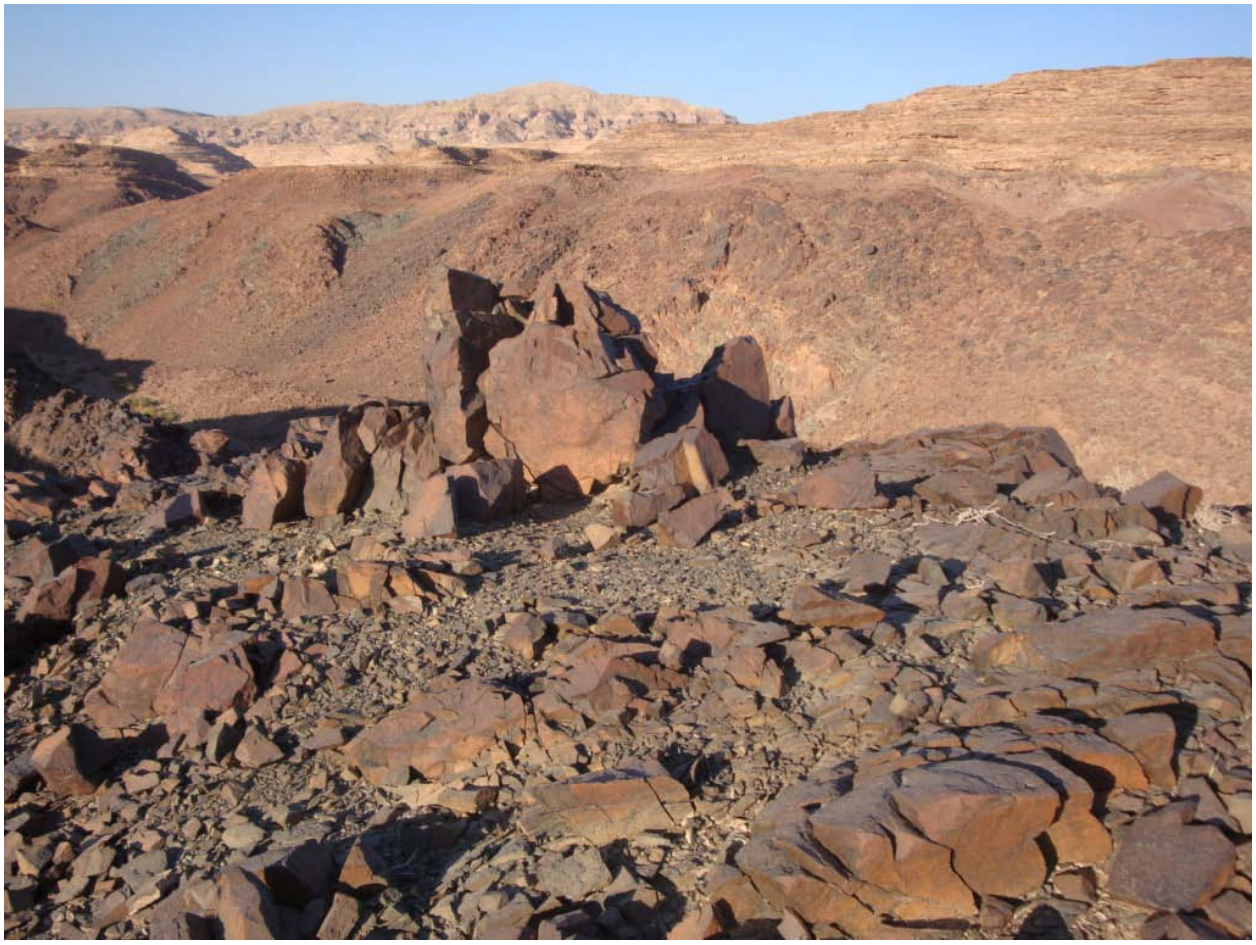

Plate 18. Wadi Zareneig © Salma Zalat

Wadi Nafkh (1400 – 1559m asl)

Plate 19. Wadi Nafkh © Salma Zalat

Wadi Makhrouga (1433 – 1497m asl)

Plate 20. Wadi Makhrouga © Salma Zalat

Wadi Fara' (1356 – 1442m asl)

Plate 21. Wadi Fara' © Salma Zalat

Methods

A grid of approximately 100 squares (10km x 10km) has been positioned over St Katherine Protectorate, south Sinai for standard effort surveys to be conducted; several un-surveyed squares in the grid are selected each year.

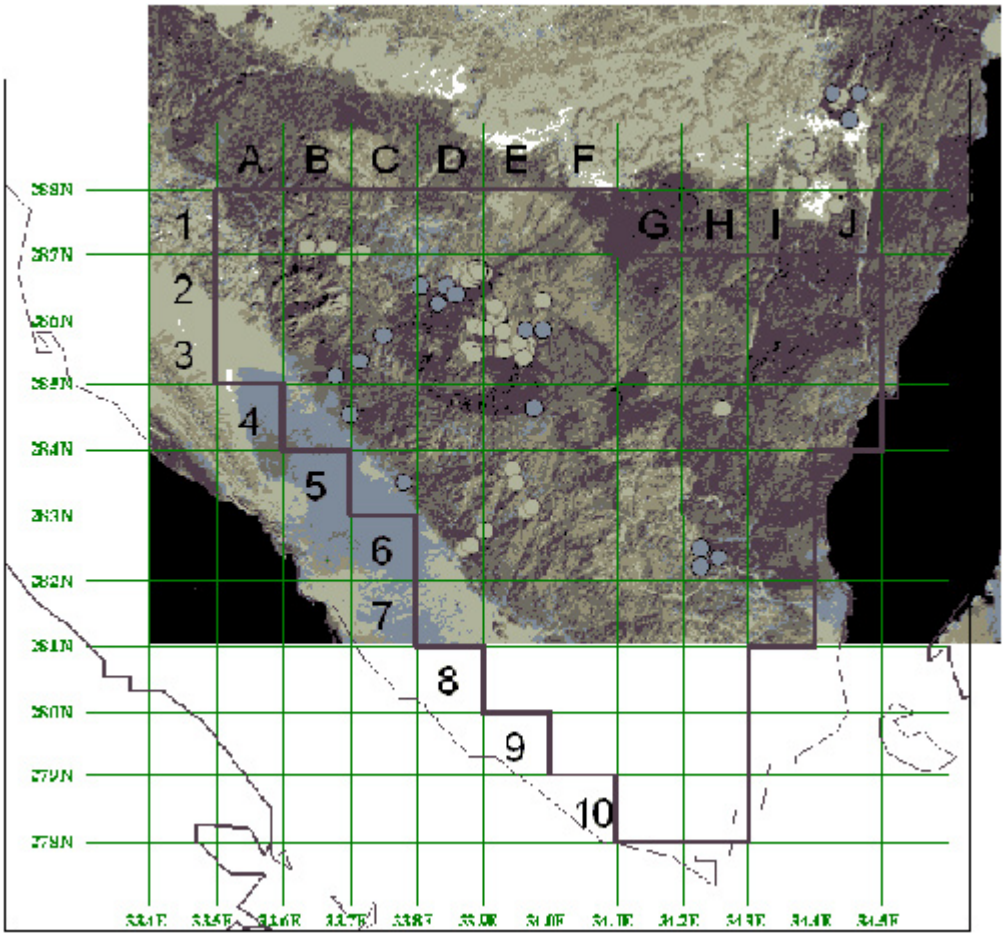

Figure 2. Atlas squares for south Sinai, St Katherine Protectorate survey areas 2005-2007

Line transects as near as possible to 2.5km were walked along each wadi starting around 06:00am at a slow pace of 1 km per hour. Random stratified sampling was applied to each transect, creating a random start and finish by using a random number generator. Also GPS fixes of start, middle and end points along the transect were noted with elevation and distance of track.

Each bird species, time, number, possible sex, flying or perched, heard or seen, habitat, distance and notes were recorded on a pre-prepared data sheet. For each observation perpendicular distance in meters was recorded from the transect line to the bird (single or cluster of birds) or nearest object to the bird. A Bushnell Scout laser rangefinder was used to estimate distance in 2009, which was also used in 2007 and 2008

Late afternoon surveys were also conducted as close as possible to 17:00pm as bird activity was found to be low throughout midday from surveys in 2005-2008 (Meakin *et al* 2005, White *et al* 2007). GPS readings were recorded along each transect at strategic points and were plotted on a GIS map later.

Playback recordings of Hume's Owl were conducted in each wadi at random points in the evening after 20:00pm (15 minutes passive and 15 minutes of playback). An mp3 player was used for the playback connected to a portable battery powered speaker.

The names and order of birds follows the Ornithological Society of the Middle East (OSME) Regional List of Birds (2007).

Results 2009

Preliminary results: diversity and abundance

A total of 36 species of birds were recorded in and out of surveys. A table of species abundance is documented in Appendix 1. Survey effort in transects was c30 hours, mean transect time was c69 minutes. Wadi Gharandel contained the highest species diversity (16 species) over two transects, as well as the highest total abundance of birds (188) closely followed by Wadi Baba (15) and St Katherine (14). Wadi Eshgerah had the lowest diversity of species with only four White-crowned Wheatear *Oenanthe leucopyga* recorded.

White-crowned Wheatear *Oenanthe leucopyga* was the most abundant species in surveys: 12.2% total number of birds, followed by House Sparrow *Passer domesticus* (9.7%) and jointly by Eurasian Collared Dove *Streptopelia decaoto* and Laughing Dove *Streptopelia senegalensis* (9.2%). White-crowned Wheatear *Oenanthe leucopyga* had the widest distribution: recorded in 85% (17/20) wadis, followed by Scrub Warbler *Scotocerca inquieta* 70% (14/20) wadis and Rock Martin *Ptyonoprogne fuligula* 50% (10/20) wadis. Several Pale Crag Martin *Ptyonoprogne obsoleta* and Rock Martin *Ptyonoprogne fuligula* were recorded but due to difficulty with differentiating this species in the field the parent taxon *Ptyonoprogne fuligula* has been used for these results.

Plate 22. Adult White-crowned Wheatear *Oenanthe leucopyga* © Wael Shohdi

Wadi Surveys

Wadi Gharandel

Wadi Gharandel situated near the Red Sea coast contained the highest diversity of 16 species. House sparrow *Passer domesticus* were the most abundant species (30.8%) followed by Eurasian Collared Dove *Streptopelia decaoto* (25%). The largest diversity of birds of prey was recorded in Wadi Gharandel including: Sooty Falcon *Falco concolor*, Barbary Falcon *Falco pelegrinoides* (Tim Coles *pers com*), Common Kestrel *Falco tinnunculus* and Hume's Owl *Strix butleri*. Several species of migrants were recorded including: European Bee-eater *Merops apiaster* (8 individuals) and Barn Swallow *Hirundo rustica* (9) feeding on insects near vegetation. Garden areas that were regularly watered provided a habitat for other migrants including: Eastern Olivaceous Warbler *Iduna pallida* (2) and Reed Warbler *Acrocephalus scirpaceus* (1).

Wadi Baba

Wadi Baba contained the second highest diversity of species (15) recorded over the longest survey period of time in four transects. Blackstart *Cercomela melanura* were the most abundant species (29.4%) followed by White-crowned Wheatear *Oenanthe leucopyga* (16.4%). The highest concentrations of Blackstart *Cercomela melanura* on expedition were recorded in this wadi. There was also the notable addition of two Hume's Owl *Strix butleri* both seen and heard out of survey.

Plate 23. Hume's Owl *Strix butleri* at caught at Wadi Baba © Andy Barker

Wadi Seih
Wadi Seih contained a diversity of 12 species: Sand Partridge *Ammoperdix heyi* were the most abundant species (20.5%), closely followed by Feral Pigeon *Columba livia domestica* located in Bedouin settlements (17.9%) and Rock Dove *Columba livia* (14.1%).

Wadi Foqa
Wadi Foqa contained a much lower diversity and abundance of avian species. Only four species were recorded, the highest abundance was three White-crowned Wheatear *Oenanthe leucopyga*. There was also the notable addition of a pair of Fan-tailed Raven *Corvus rhipidurus* recorded out of survey roosting on a nearby cliff to the camp.

Wadi Hamier
Wadi Hamier also contained a low diversity and abundance of species, only seven species were recorded. The highest abundance was: Sand Partridge *Ammoperdix heyi* (41.6%) followed jointly by several Olive-tree Warbler *Hippolais olivetorum* on stop-over, White-crowned Wheatear *Oenanthe leucopyga* and Blackstart *Cercomela melanura* (12.5%). 2 individual Hooded Wheatear *Oenanthe monacha* were also recorded.

Wadi Karanc
Wadi Karanc contained a low diversity and abundance of species, only six species were recorded. The highest abundance was: Blackstart *Cercomela melanura* (30.7%), followed by Rock Martin *Ptyonoprogne fuligula* (23%). One Hooded Wheatear *Oenanthe monacha* was also recorded perching on a well.

Wadi Tayiba
Wadi Tayiba had a slightly higher diversity and abundance of species, eight species were recorded. The highest abundance was: Blackstart *Cercomela melanura* (32.2%), followed by Scrub Warbler *Scotocerca inquieta* (25.8%).

Wadi Barag
Wadi Barag had a low diversity and abundance of species, only six species were recorded. Blackstart *Cercomela melanura* and White-crowned Wheatear *Oenanthe leucopyga* had the highest joint abundance (25.8%), followed by Laughing Dove *Streptopelia senegalensis* (22.5%).

Wadi Gharba
Wadi Gharba had a higher diversity (11) and abundance of species; parts of this wadi have also been surveyed in previous years in 2005 and 2006. Rock Martin *Ptyonoprogne fuligula* had the highest abundance (22.7%), followed by White-crowned Wheatear *Oenanthe leucopyga* (15.9%). Several cultivated gardens with fruit trees also attracted small numbers of migrant warblers on stop-over such as: 4 Eastern Olivaceous Warbler *Iduna pallida* and 6 Eastern Orphean Warbler *Sylvia hortensis*.

St Katherine City
St Katherine had a much higher diversity of species recorded over two out-of-expedition transects. 14 species were observed including locally common species such as: Sinai Rosefinch *Carpodacus synoicus* and Palestine Sunbird *Cinnyris osea*.

Coloured Mountain Camp Site
Coloured mountain camp site contained a low species diversity and abundance. Five species were recorded on survey: Rock Martin *Ptyonoprogne fuligula* had the highest abundance (50%), followed by White-crowned Wheatear *Oenanthe leucopyga* (30%). Interestingly a passage migrant Black-crowned Night Heron *Nycticorax nycticorax* was observed in casual observation.

Coloured Mountain
Coloured Mountain transect contained a very low species diversity (4) and abundance. Feral pigeon *Columba livia domestica* had the highest abundance (73%), followed by three migrant Greater Short-toed Lark *Calandrella brachydactyla* (11.5%).

Wadi Sanad
Wadi Sanad contained very low species diversity and abundance. Only two species were recorded including: two Scrub Warblers *Scotocerca inquieta* and one White-crowned Wheatear *Oenanthe leucopyga*.

Wadi Eshgerah
Wadi Eshgerah contained a very low species abundance and diversity. Only one species was recorded in Wadi Eshgerah, four White-crowned Wheatear *Oenanthe leucopyga*.

Wadi Degayeg
Wadi Degayeg contained a very low species diversity and abundance. Only three species were recorded; all passage migrants on stop-over including: six Greater Short-toed Lark *Calandrella brachydactyla*, one Olive-tree Warbler *Hippolais olivetorum* and one Lesser Whitethroat *Sylvia curruca*.

Wadi Hammami
Wadi Hammami contained a slightly higher species diversity and abundance. Eight species were recorded including: White-crowned Wheatear *Oenanthe leucopyga* with the highest abundance (30%), followed by Scrub Warbler *Scotocerca inquieta* (20%). Several migrants were recorded on stop-over including: two Greater Short-toed Lark *Calandrella brachydactyla*, one Lesser Whitethroat *Sylvia curruca* and three Eastern Orphean Warbler *Sylvia hortensis*.

Wadi Zaraneig
Wadi Zaraneig contained a very low species diversity and abundance, only five species were recorded. Interestingly six migrant Greater Short-toed Larks *Calandrella brachydactyla* were observed (46.1%), the highest total abundance, followed jointly by: Sand Partridge *Ammoperdix heyi*, Scrub Warbler *Scotocerca inquieta* and Eastern Orphean Warbler *Sylvia hortensis* (15.3%).

Wadi Nafkh
Wadi Nafkh contained a very low diversity and abundance of species, only one White-crowned Wheatear *Oenanthe leucopyga* was recorded on survey with two Brown-necked Ravens *Corvus ruficollis* observed in casual observation.

Wadi Makhrouga
Wadi Makhrouga again had a very low diversity and abundance of species; only two species were recorded including: two Scrub Warblers *Scotocerca inquieta* and one Hooded Wheatear *Oenanthe monacha*.

Wadi Fara'
Wadi Fara' also had a very low diversity and abundance of species. Only two species were recorded including: three White-crowned Wheatear *Oenanthe leucopyga* and two Scrub Warbler *Scotocerca inquieta*.

Discussion

36 species of birds were recorded in total over the 2009 expeditions, c25 resident breeding species were observed out of a possible total of c50 (Meakin *et al* 2005). There were notable new additions not observed in BioMAP/Operation Wallacea surveys from 2005-2008 including: Black-crowned Night Heron *Nycticorax nycticorax*, Lesser Kestrel *Falco naumanni*, Barbary Falcon *Falco pelegrinoides* and Greater Short-toed Lark *Calandrella brachydactyla*.

Birds of Prey

Most notable for their absence were birds of prey; only five species were observed over four weeks of intensive surveys. Four of those species were recorded at Wadi Gharandel including: Common Kestrel *Falco tinnunculus*, Sooty Falcon *Falco concolor*, Barbary Falcon *Falco pelegrinoides* and Hume's Owl *Strix butleri*. Two Hume's Owl *Strix butleri* were observed in Wadi Baba, one bird was caught late in the evening in a mist-net close to a Bedouin settlement by Jane Carpenter (Bat Scientist).

2009 survey records probably indicate the continued absence of birds of prey in and around the St Katherine Protectorate possibly linked to a decline in prey and illegal increases in unregulated hunting (Baha El Din 1999). More intensive and targeted surveys are vital to fully ascertain the status of rare resident breeding birds of prey such as the endangered Egyptian Vulture *Neophron percnopterus* (Birdlife International 2008) in St Katherine Protectorate and other areas in Egypt.

European Bee-eaters

Large flocks of European Bee-eater *Merops apiaster* (c20 adults) were observed calling, perching and feeding in the gardens of Wadi Gharandel over the 16th and 17th July; well before the bulk migration period between late August and late October (Goodman *et al* 1989). Due to this early observation and large numbers observed it could be possible that there is a rare breeding colony in Wadi Gharandel (Baha El Din *pers comm*).

Warblers

In most wadi systems various species of migrant warblers were recorded including: Reed Warbler *Acrocephalus scirpaceus*, Eastern Olivaceous Warbler *Iduna pallida*, Olive-tree Warbler *Hippolais olivetorum*, Lesser Whitethroat *Sylvia curruca*, Eastern Orphean Warbler

Sylvia hortensis. The first observation of an Eastern Olivaceous Warbler *Iduna pallida* was recorded at Wadi Gharandel on the 17th July and a higher frequency of warbler numbers were recorded until the end of the surveys on the 10th August. Eastern Olivaceous Warblers *Iduna pallida* are an abundant breeding species of semi-desert and the Nile Valley (Snow *et al* 1998) and the July records may represent resident individuals.

Notably most observations of warblers were recorded in Bedouin gardens and acacia trees. Warblers were regularly seen foraging and roosting in acacia trees; if disturbed they would fly from tree to tree. Acacia trees appear to be a vital micro-habitat for migrant species on stop-over (Salewski *et al* 2006). More research should be conducted investigating migrants on stop-over and habitat associations in and around the St Katherine Protectorate (Busse *pers com*).

Wheatears

Three resident breeding species of Wheatears were again recorded on expedition: Mourning Wheatear *Oenanthe lugens*, White-crowned Wheatear *Oenanthe leucopyga* and Hooded Wheatear *Oenanthe monacha*. Notably the White-crowned Wheatear *Oenanthe leucopyga* had the highest abundance of all species on expedition surveys and was widely distributed over a range of altitudes and habitats in nearly all surveys (17/20 wadis). Only three Mourning Wheatears *Oenanthe lugens* were recorded at lower altitudes in Wadi Gharandel and several Hooded Wheatears *Oenanthe monacha* were recorded at higher altitudes. It appears with present data Mourning Wheatear *Oenanthe lugens* and Hooded Wheatear *Oenanthe monacha* have a patchy distribution over the St Katherine Protectorate; possibly due to seasonal altitudinal preferences and interspecific competition with the White-crowned Wheatear *Oenanthe leucopyga* (Goodman *et al* 1989). More survey effort in the St Katherine Protectorate is necessary to fully ascertain the status and distribution of Mourning Wheatear *Oenanthe lugens* and Hooded Wheatear *Oenanthe monacha*.

Bird Conservation Issues in the St Katherine Protectorate

Habitat Degradation

In most wadis several feral camels, donkeys, goats and sheep were regularly observed feeding on scrub vegetation and acacia trees. Overgrazing and firewood collection may have negative effects on habitats for birds especially in areas such as the south Sinai which receive little rainfall to aid natural vegetation renewal.

Unregulated Hunting

As there have been few formal studies to assess the effects of hunting on bird populations it is difficult to determine the effects of hunting on migratory birds. Hunting can possibly have significant effects on the populations of some species such as Corncrake *Crex Crex*; it is estimated that over 4000 Corncrakes *Crex Crex* are caught every autumn in Egypt (Baha El Din 1993). Moreover falcon and passerine bird trapping will further deplete species populations such as the Saker Falcon *Falco cherrug*.

Future recommendations for 2010 season

Operation Wallacea Egypt

With the support of two directors of the Nature and Science Foundation: Dr Samy Zalat (Suez Canal University/Egypt) and Dr Francis Gilbert (University of Nottingham/UK) on site, the project benefited from having expert scientific coordination with prior knowledge of the areas to be surveyed; if possible this should be continued in future years.

Staff such as Matthew White (Ornithologist), Salma Zalat (NSF Manager), Haithan Zalat (Botanist), Jill Carpenter (Bat Scientist) and Ahmed El-Gabbas (Herpetologist) repeating annual expedition surveys can build on prior knowledge and call on experience to project manage logistical problems in the field such as; coordination and timing of transects in the morning and afternoon with other staff members.

Again in the 2009 season the essential reduction in bird survey group sizes to no more than five greatly improved the quality of the surveys as there was less noise disturbance. Also each member of the group could be properly trained in bird survey methods and had a motivating working role. The addition of Ahmed El-Gabbas surveying reptiles in 2009 allowed for much more effort devoted to both bird and reptile surveys.

The continued use of playback recordings to uncover the distribution of owl species is recommended.

South-east European Bird Migration Network Workshop, Gdansk, Poland, December 2009

Operation Wallacea/NSF migrant bird results were presented by Matthew White at the South-east European Migration Network Workshop at Gdansk, Poland in December 2009. The published abstract: Recent surveys of breeding and migratory birds in the St Katherine Protectorate IBA, south Sinai, Egypt 2005 – 2009 can be located at the following links below on the South-east European Bird Migration Network website. Hopefully the results of the Western Desert expedition can be presented at the SEEN Workshop in 2010.
http://www.seen-net.eu/index.php?id=166
http://www.seen-net.eu/index.php?id=173

PhD development

The start and development of a PhD focusing on avian distributions in Egypt analysing BioMAP/NSF/Operation Wallacea data will be initiated in autumn 2010 by the author under the supervision of Dr Francis Gilbert (University of Nottingham/NSF) and Dr Samy Zalat (Suez Canal University/NSF).

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Appendix 1. Total number of birds on expedition surveys

Species	Status	No. of wadis recorded (20)	Wadi Gharandel (2)	Wadi Baba (4)	Wadi Seih (2)	Wadi Foqa (1)	Wadi Hamier (1)	Wadi Karanc (1)	Wadi Tayiba (1)	Wadi Barag (1)	Wadi Gharba (1)	St Katherine City	Camp Site (1)	Coloured Mountain (1)	Wadi Sanad (1)	Wadi Eshgerah (1)	Wadi Degayed (1)	Wadi Hammami (1)	Wadi Zaraneig (1)	Wadi Nafkh (1)	Wadi Makhrouga (1)	Wadi Fara' (1)	Totals
Sand Partridge *Ammoperdix heyi*	R	8		3	16		10		*		3	*						3	2				37
Black-crowned Night Heron *Nycticorax nycticorax*	M	1											*										*
Lesser Kestrel *Falco naumanni*	M	1		1																			1
Common Kestrel *Falco tinnunculus*	R	1	1																				1
Sooty Falcon *Falco concolor*	M	1	*																				*
Barbary Falcon *Falco pelegrinoides*	R	1	*																				*
Rock Dove *Columba livia*	R	5		1	11						*	*		19									31
Feral Pigeon *Columba livia domestica*	R	3	25	13	14																		52
Eurasian Collared Dove *Streptopelia decaoto*	R	5	47		*	3					5	*											55
Laughing Dove *Streptopelia senegalensis*	R	8	22	13	8			1	*	7	4	*											55
Hume's Owl *Strix butleri*	R	2	*	*																			*
European Bee-eater *Merops apiaster*	M	2	8									*											8
Eurasian Hoopoe *Upupa epops*	R	5	1	1	*				*	3													5
Brown-necked Raven *Corvus ruficollis*	R	2	7		*															*			7
Fan-tailed Raven *Corvus rhipidurus*	R	1				*																	*
Barn Swallow *Hirundo rustica*	M	1	9																				9
Rock Martin *Ptyonoprogne fuligula*	R	10	5	4	4			3	6	2	10	*	5					1					40
Desert Lark *Ammomanes deserti*	R	7		*	7	2	2		1			*											12
Greater Short-toed Lark *Calandrella brachydactyla*	M	4												3			6	2	6				17
Scrub Warbler *Scotocerca inquieta*	R	14		5	8			2	8	3	*	*	2	2	2			4	2		2	2	42
White-spectacled Bulbul *Pycnonotus xanthopygos*	R	2		5								*											5
Reed Warbler *Acrocephalus scirpaceus*	M	1	*																				*
Eastern Olivaceous Warbler *Iduna pallida*	M	2	2	*							4												6
Olive-tree Warbler *Hippolais olivetorum*	M	2					3										1						4
Lesser Whitethroat *Sylvia curruca*	M	2															1	1					2
Eastern Orphean Warbler *Sylvia hortensis*	M	4									6	*						3	2				11

Tristram's Starling *Onychognathus tristramii*	R	2		*								*											*
Mourning Wheatear *Oenanthe lugens*	R	1	3																				3
White-crowned Wheatear *Oenanthe leucopyga*	R	17		14	9	3	3	2	6	8	7	*	3	2	1	4		6	1	1		3	73
Hooded Wheatear *Oenanthe monacha*	R	3					2	1													1		4
Blackstart *Cercomela melanura*	R	7		25	1		3	4	10	8	3												54
Palestine Sunbird *Cinnyris osea*	R	1										*											*
House Sparrow *Passer domesticus*	R	1	58																				58
Trumpeter Finch *Bucanetes githagineus*	R	1					1																1
Sinai Rosefinch *Carpodacus synoicus*	R	2									2	*	*					*					2
Totals			188	85	78	8	24	13	31	31	44	*	10	26	3	4	8	20	13	1	3	5	595

* = observed out of expedition survey
R = Resident species, M = Migrant Species

Appendix 2.

List of species recorded

Black-crowned Night Heron *Nycticorax nycticorax*
Sand Partridge *Ammoperdix heyi*
Lesser Kestrel *Falco naumanni*
Common Kestrel *Falco tinnunculus*
Sooty Falcon *Falco concolor*
Barbary Falcon *Falco pelegrinoides*
Rock Dove *Columba livia*
Feral Pigeon Columba *livia domestica*
Eurasian Collared Dove *Streptopelia decaoto*
Laughing Dove *Streptopelia senegalensis*
Hume's Owl *Strix butleri*
European Bee-eater *Merops apiaster*
Eurasian Hoopoe *Upupa epops*
Brown-necked Raven *Corvus ruficollis*
Fan-tailed Raven *Corvus rhipidurus*
Barn Swallow *Hirundo rustica*
Rock Martin *Ptyonoprogne fuligula*
Pale Crag Marin *Ptyonoprogne obsoleta*
Desert Lark *Ammomanes deserti*
Greater Short-toed Lark *Calandrella brachydactyla*
Scrub Warbler *Scotocerca inquieta*
White-spectacled Bulbul *Pycnonotus xanthopygos*
Reed Warbler *Acrocephalus scirpaceus*
Eastern Olivaceous Warbler *Iduna pallida*
Olive-tree Warbler *Hippolais olivetorum*
Lesser Whitethroat *Sylvia curruca*
Eastern Orphean Warbler *Sylvia crassirostris*
Tristram's Starling *Onychognathus tristramii*
Mourning Wheatear *Oenanthe lugens*
White-crowned Wheatear *Oenanthe leucopyga*
Hooded Wheatear *Oenanthe monacha*
Blackstart *Cercomela melanura*
Palestine Sunbird *Cinnyris osea*
House Sparrow *Passer domesticus*
Trumpeter Finch *Bucanetes githagineus*
Sinai Rosefinch *Carpodacus synoicus*

The names and order of birds follows the Ornithological Society of the Middle East (OSME) Regional List of Birds (2007).