

# A note on occurrence at man-made habitats of wintering Greater Spotted *Aquila clanga* and Eastern Imperial Eagles *A. heliaca* in the coastal belt of eastern Saudi Arabia

BRIAN S MEADOWS

Observations over a ten-year period confirm that Greater Spotted Eagles *Aquila clanga*—despite recent losses of natural wetland sites—are now utilizing man-made wetland habitats and a few Eastern Imperial Eagles *Aquila heliaca* are also wintering regularly at man-made sites, particularly landfills, in addition to traditional steppe. This note includes a brief discussion on trends and possible future development of man-made habitats in the coastal belt of eastern Saudi Arabia.

## BACKGROUND

Greater Spotted *Aquila clanga* and Eastern Imperial Eagles *Aquila heliaca* have been declining for many decades. In the case of the former it is known that this was on-going from as early as the mid-nineteenth century as persecution increased and wooded wetlands were destroyed in Europe (eg Brown 1976). Threats to the Eastern Imperial Eagle are more recent especially in Asia. One reason for their decline is probably the loss of fields and pastures as a result of less agriculture in their forest-steppe breeding grounds following the collapse of the Soviet Union. Central Asia is a likely source area for Eastern Imperial Eagles occurring in eastern Saudi Arabia—a bird tagged in Kazakhstan in July, for example, was found later in the same year in Qatar (Balmer & Murdoch 2010) and in 2010 three wing-tagged birds, also from Kazakhstan, were seen in Kuwait.

Although some individuals of both species winter south of the equator—a Greater Spotted Eagle tagged in eastern Europe reached wetlands in southern Africa, and a few Eastern Imperial Eagles are seen in most years on the highland steppes of East Africa, the Middle East still appears to be a main wintering area for both species. Within the Middle East the northern inland deserts of Saudi Arabia are known to be an important wintering area for Eastern Imperial Eagles. Jennings *et al* (2009) estimated, based on extrapolated data obtained during a survey in February 2009 which involved over 1500 km of driven transect counts producing 63 birds, a population of over 4000 birds over the whole study area of 231 407 km<sup>2</sup>. On 26 and 27 December 1996 I counted 10 birds along two 126 km transects across the Dibdibah (a sub-zone of Saudi Arabia's northern desert) and on 3 January 1998 10 large *Aquila* eagles (at least 7 being Eastern Imperial Eagles) were counted along a 75 km transect in the same area; if these are extrapolated they would have given similar estimates to Jennings *et al*'s (2009) figures. The total world population has been given as probably not more than 2000 breeding pairs (Ferguson-Lees & Christie 2001).

Until relatively recently the Eastern Imperial Eagle was almost entirely restricted to the northern deserts and generally absent from the coastal belt, below 100 m asl, of the Eastern province of Saudi Arabia. In contrast, due to its preference for wetland habitats in Arabia, such as freshwater marshes and mangrove swamps, the coastal zone has always been virtually the only wintering area for Greater Spotted Eagles (Bundy *et al* 1989).

However, as illustrated by Loblely (2007), both species of eagles are now occurring regularly at some man-made sites in the coastal belt of eastern Saudi Arabia. Increasing coastal urbanization and land reclamation as envisaged by Bundy *et al* (1989) has accelerated extremely rapidly. It has included the completion of a new industrial city at Jubail (27° 00' N, 49° 39' E), the designation of Greater Damman with the merger of settlements at Dhahran, Al-Khobar, Damman and Qatif (26° 18' N, 50° 07' E to 26° 31' N,

50° 01' E) and expansion of port facilities at several sites. Such development has meant an inevitable loss of natural habitats, especially some extensive stands of *Avicennia marina* mangroves and coastal marsh grass. This note provides additional observations on the utilization of six man-made sites by eagles obtained while I was a resident in the eastern coastal belt of Saudi Arabia 1994–2004. My data was gathered over a longer time frame than Loble (2007) and includes information on number of birds, presumably overwintering, mid December–late February.

## OBSERVATIONS

The six sites listed in Appendix 1 (all man-made or man-modified) were all visited at least once each month, usually during the working week within the industrial city of Jubail or at weekends elsewhere. Each site visit lasted a minimum of 60 minutes and all eagles observed, save fly-over sightings, were recorded. If more than one visit was made at a site the maximum number of birds seen during the month has been listed in Table 1. This table gives the combined monthly occurrence of eagles at all of these sites 1 September 1994–30 April 2004.

In order to arrive at an estimate (see below) of the current overwintering population in the Saudi Arabian sector of the Gulf coastal lowlands—as defined in Jennings (2010)—only January data has been used in order to eliminate, as far as possible, birds on passage; also two of the sites (Qatif sanitary landfill and adjacent Haradh dairy farm) have been considered to be separate from Jubail as they attracted different individuals. Although eagles can travel over a wide area, observations of distinctly marked birds did show some apparent interchange between the four localities at Jubail (including Khafrah marsh) but there was no indication of movement of birds between Jubail and Qatif in mid winter. Additionally, it was noticed, at least in the case of Eastern Imperial Eagles at and around landfills, individuals ranged over a much smaller area than they would if they were hunting over natural steppe habitat further inland. The number of eagles seen only at Jubail sites in January over the 10-year recording period was 12 and 8 for Greater Spotted Eagle and Eastern Imperial Eagle, respectively. Taking into account the fact that several non-wetland man-made sites were not visited by the author in mid winter (eg Peter Symens informed me that he saw 5 Eastern Imperial Eagles at an agricultural project—Al Sharkiyah development area—50 km southwest of Jubail in January 1995) the number of Eastern Imperial Eagles overwintering in the Saudi Arabian sector of the Gulf coastal lowlands is probably not less than 3–4 individuals in most years. An equivalent estimate for the number of overwintering Greater Spotted Eagles in this region is likely to be at least double this figure given only two out of many potentially suitable man-made or man-modified wetlands were regularly checked.

**Table 1.** Cumulative monthly sightings of Greater Spotted Eagles *Aquila clanga* and Eastern Imperial Eagles *A. heliaca* over the study period (1 September 1994–30 April 2004), see text.

	<i>clanga</i>	<i>heliaca</i>
September	1	0
October	9	0
November	33	12
December	29	7
January	14	14
February	9	11
March	24	12
April	14	0

**Table 2.** Number of sightings on an annual basis of Greater Spotted Eagles *Aquila clanga* and Eastern Imperial Eagles *A. heliaca*, see text.

	<i>clanga</i>	<i>heliaca</i>
1994/5	13	4
1995/6	7	10
1996/7	6	8
1997/8	8	9
1998/9	5	8
1999/0	3	10
2000/1	14	2
2001/2	10	1
2002/3	46	0
2003/4	21	4

Table 2 lists the numbers of both species seen annually—save during 2002/3 both were recorded each year during the 10-year period. Tables 1 and 2 indicate that, contrary to expectations, a significant decline in wintering eagle numbers has, to date, apparently not been evident and man-made sites show that they can provide suitable alternative feeding areas.

Greater Spotted Eagles were found to arrive earlier and leave later than Eastern Imperial Eagles although several records listed in Table 1 during late autumn and early spring almost certainly included some birds on passage. Apart from a single record of a Greater Spotted Eagle over a remaining mangrove stand at Tarut bay (26° 37' N, 50° 05' E) and nine birds hunting over a long-established palm garden near Qatif on various dates (both localities excluded from the Tables), all sites listed in Appendix 1 were the only places where I saw these two species of eagles within the coastal belt. Every locality listed in Appendix 1 has been developed since around 1990; three of the six sites being mentioned by Lobley (2007).

## TRENDS

Observations (Table 2) indicate a small decline in Eastern Imperial Eagle numbers during the second half of my residence while the number of Greater Spotted Eagles increased. However, these trends cannot be confirmed statistically due to the ad-hoc way the data was collected. The results for Greater Spotted Eagles may be genuine as the increase coincides with the drainage of significant areas of the Iraq marshes following the end of the Gulf war in 1991, and over the same period there was a considerable increase of reed-swamp at Sabkhat al Fasl caused by rapid growth and colonization of additional areas of sabkha by *Phragmites australis*. It is known that the Iraq marshes were a significant wintering area for Greater Spotted Eagles prior to the Gulf war (Scott & Carp 1982).

## FUTURE

In the immediate future the need to provide services and necessary infrastructure, such as sewage disposal and refuse disposal, will ensure that suitable sites will continue. However, in the longer-term, advances in wastewater treatment technology could affect the long-term viability of some of the newly created wetland habitats in Saudi Arabia. For example, it is known that there is a plan at Jubail to eventually use surplus effluent, now currently being sent to Sabkhat al Fasl, in primary industries as a source of process water in place of existing supplies. In the case of refuse disposal, incineration of waste rather than tipping into open cells is a possibility or composting cum recycling could also go ahead at some cities in the future. Finally, there are also economic and political arguments to abandon the continued use of groundwater abstraction for agricultural projects, particularly those on sub-optimal soils.

## ACKNOWLEDGEMENT

Michael Jennings supplied additional transect data from his 2009 survey of northern Saudi Arabia.

## REFERENCES

- Balmer, D & D Murdoch. 2010. Around the Region. *Sandgrouse* 32: 91–102.
- Brown, L. 1976. *Eagles of the World*. David & Charles, Newton Abbot, UK.
- Bundy, G, RJ Conner & CJO Harrison. 1989. *Birds of the Eastern Province of Saudi Arabia*. Witherby, London.
- Ferguson-Lees, J & DA Christie. 2001. *Raptors of the World*. Christopher Helm, London.
- Jennings, MC. 2010. Atlas of the breeding birds of Arabia. *Fauna of Arabia* 25.
- Jennings, MC, M Al Salamah, B Abu Qaboos & HN al Subaie. 2009. *Wintering birds in northern Saudi Arabia: February 2009 (ABBA Survey 40)*. Jennings, Cambs, UK. (Summary *Phoenix* 26: 19–24)
- Lobley, GR. 2007. Wintering of Greater Spotted *Aquila clanga* and Eastern Imperial Eagles *A. heliaca* in the Arabian Peninsula. *Sandgrouse* 29: 177–183.

Meadows, BS. 2004. Sites of interest: Sabkhat al-Fasl, Eastern Province, Saudi Arabia. *Phoenix* 20: 12–16.  
Meadows, BS. 2009. Sites of interest: Khafrah Marsh, Eastern Province, Saudi Arabia. *Phoenix* 25: 9–10.  
Scott, DA & E Carp. 1982. A mid-winter survey of wetlands in Mesopotamia, Iraq: 1979. *Sandgrouse* 4: 60–76.

*Brian S Meadows, 9 Old Hall Lane, Walton-on-the-Naze, Essex, CO14 8LE, UK. briansmeadows@lycos.com*

#### **Appendix I.** Brief descriptions of man-made or man-modified sites regularly visited (see text).

**Sabkhat al Fasl.** This was the most important site for eagles (a total of 94 Greater Spotted Eagles and 5 Eastern Imperial Eagles were seen here) and consists of a salt-pan area that receives fully treated sewage effluent of a constant high quality surplus to irrigation requirements for landscaping in the industrial city of Jubail. The water on the pans is very shallow (usually less than 30 cm) and supports dense stands of reedbeds exceeding 2500 ha in area; waders and wildfowl occur in very large numbers. Reed-swamp vegetation increased on an annual basis 1994–2004. A fuller description, including an aerial view of the site, can be found in Meadows (2004).

**Jubail sanitary landfill.** This site was developed on a salt pan and used for disposing mixed domestic (non-hazardous) waste, which in Saudi Arabia has a high organic content unlike many other developing countries, plus separate sectors for builders' rubble and garden waste. A series of large lined cells receive the waste from trucks. The attraction for Eastern Imperial Eagles to this and similar landfills is probably the quantity of carrion, such as chicken carcasses and offal, available. The site produced only 2 Greater Spotted Eagle sightings but 27 Eastern Imperial Eagles were seen over the ten-year recording period.

**Green-belt zone at Jubail.** At the industrial city of Jubail all petrochemical facilities have been located in a primary industrial area and a green belt where grazing animals are excluded has allowed desert vegetation to develop on former reclaimed salt pans. The green belt separates the primary industrial area from residential and support industry zones and was used by both species.

**Khafrah marsh.** This is a wetland served by natural springs that has been augmented by run-off water from flood-irrigation of horticultural crops for the local market (26° 48' N, 49° 34' E). As in the case of Sabkhat al Fasl the extent of reed-swamp increased during my period of residence and this may have gradually attracted more wintering Greater Spotted Eagles—I had 5 sightings 2000–2004 but none previously. Eastern Imperial Eagles were never recorded. The marsh has been described in more detail by Meadows (2009).

**Haradh dairy farm.** Cows are kept in covered sheds with open sides but are fed on fodder grown on adjacent central-pivot sprinkler systems—it is the latter that attracted eagles of both species (15 Greater Spotted Eagles and 5 Eastern Imperial Eagles). The farm is relatively close to the coast and only 9 km from the centre of Qatif which is probably why so many of the former species were using this site. In the northern deserts where similar sprinkler systems had been established, the author never observed Greater Spotted Eagles—eg at a location 50 km west of Nuayriyya (27° 28' N, 48° 27' E) the latter species was never recorded although 17 Eastern Imperial Eagles were seen hunting in crops below the sprinklers during three January visits.

**Qatif sanitary landfill.** A landfill developed on a relatively flat part of the al-Jufurah sand desert, a northerly extension of the Empty Quarter (Rub al-Khali), used for disposal of domestic waste with separate areas for other non-hazardous material.