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House Crow *Corvus splendens* nesting on pylons, Kutch district, Gujarat, India

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Introduction

During the past 50 years, electric power transmission lines have become a conspicuous part of the landscape of industrialised countries. These powerlines and their supporting structures (pylons) are known to cause avian mortality, and in recent decades this has been increasingly documented throughout the world (Bevanger 1994, Brown & Drewien 1995, Winning & Murray 1997, Janss & Ferrer 2000, Sundar & Choudhury 2001, Shaw *et al.* 2010, Tere & Parasharya 2011). A recent review summarised some adverse effects of the electromagnetic fields around powerlines on avian reproductive biology and physiology (Fernie & Reynolds 2005). In contrast, power cables and supporting structures in open habitats benefit some bird species by providing perches offering commanding views of hunting areas (Lammers & Collopy 2007, Asokan & Ali 2010) and nest sites (Brown & Lawson 1989, Steenhof *et al.* 1993, Infante & Peris 2003). The use of these structures for

nesting purposes is a fairly recent development and has enabled some species to expand their breeding ranges into areas where there are no natural nesting sites.

Published literature on the use of pylons (large vertical steel towers supporting high-tension powerlines) for nesting by Indian birds is sparse. Here, we report on House Crow *Corvus splendens* nesting on pylons in Kutch district, Gujarat, India. House Crows typically build stick nests, usually in large trees with spreading crowns, but nesting on pylons is a relatively recent phenomenon.

Materials and methods

The study was conducted in and around the Samakhiali region (23.303°N 70.507°E) of Bhachau Taluk, Kutch district, in June and July 2012. The study area is flat terrain with scanty vegetation dominated by agricultural fields and human settlements with several scattered waterbodies of varying sizes. The area has a

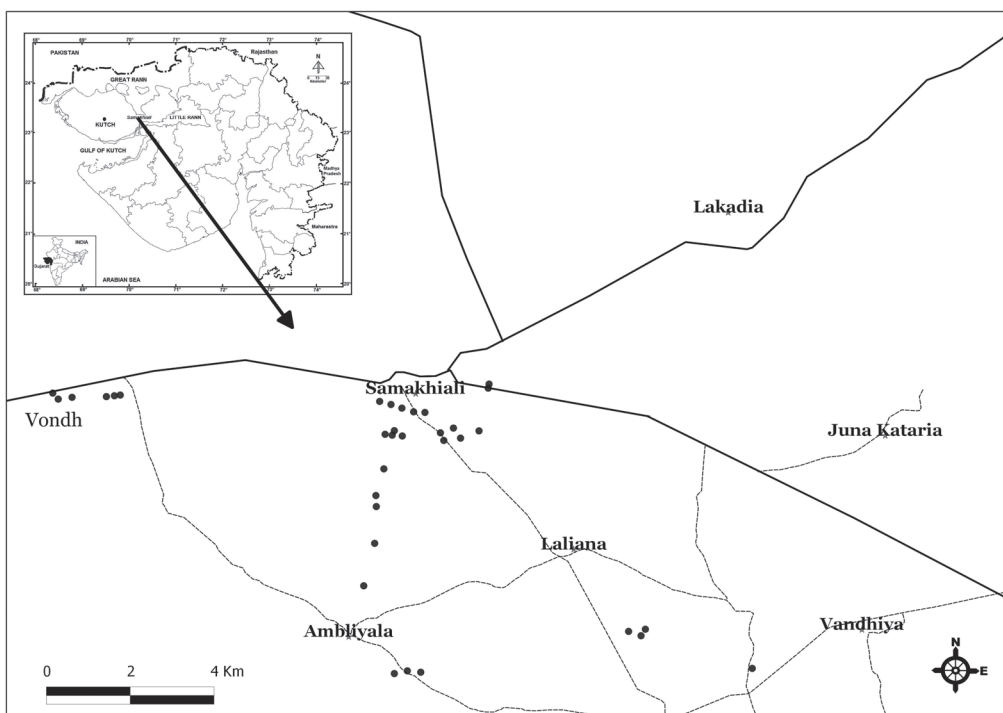


Figure 1. Map of the study area showing the localities of House Crow nest sites on pylons (black dots).

characteristic dry and hot climate, with average temperatures during the hottest months ranging from 17.6°C to 39.5°C and an annual rainfall of around 400 mm.

A visual survey was done at each pylon while following the transmission lines in the area either by vehicle or on foot. In total, 71 pylons were surveyed, all of which had three consoles (cross-member structures) carrying 110 to 400 kV lines; between one and six power cables were carried on each side of the consoles. Nest sites were located using 8×50 and 12×50 binoculars and the following information was recorded: pylon type, total height and height of nest(s) above ground (estimated visually), number of nests on the pylon and vegetation (trees, shrubs, herbs) around the nest site. Nests were considered active if a bird was incubating, exhibiting defensive behaviour (defensive vocalisations by a bird perched near the nest) or a juvenile was present at the nest. Coordinates of each nest site were recorded using a hand-held Global Positioning System.

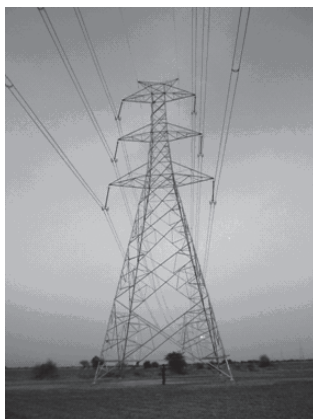
Results and discussion

During the study period, a total of 34 active House Crow nest sites were recorded on pylons; 19 sites were in agricultural fields, 8 in scrublands and 7 within human settlements (Figure 1). Four different types of pylons are used to support transmission lines passing through the area, and based on the design, they were designated Type A ($n = 6$), Type B ($n = 18$), Type C ($n = 33$) and Type D ($n = 14$) (Plate 1). The House Crow nested on all four types with the majority of nests (41.2%) being found on Type C—the most common pylon type. This was followed by Type B (26.5%), Type D (23.5%) and Type A (8.8%); the proportion of nests found on the different types of pylon is similar to the proportion that would be expected by chance (Fisher's Exact Test, $P = 0.85$). The pylons used for nesting were between 20 and 50 m in height (mean 29.1 ± 7.53 m). The height of the location of House Crow nests on pylons

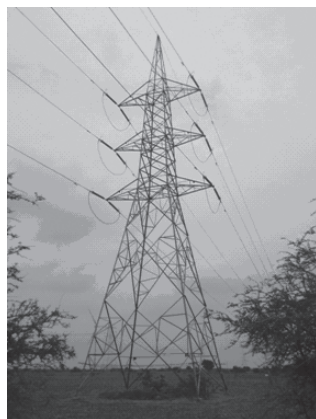
varied from 15 to 49 m (mean 25.2 ± 7.2 m). The number of nests found on a single pylon varied between one and three (Plate 2); a single nest was recorded on 27 pylons, two nests on 5 and three nests on 2 pylons. Of the 34 House Crow nest sites examined, significantly more nests than expected by chance were placed in the top console (55.8%) of the pylon, followed by the middle console (29.4%), and the bottom console (14.7%) (Fisher's Exact Test, $P < 0.001$).

House Crows are well known to live commensally with humans (Ali & Ripley 1983) and usually construct their nests on large, well-branched dense canopy trees close to human settlements (Ali & Ripley 1983, Ryall 1990, Akter *et al.* 1994, Vyahare 1998, Allan & Davies 2005, Ali *et al.* 2011, Chongomwa 2011). On Kharg Island in the Persian Gulf, Behrouzi-Rad (2010) recorded House Crows nesting on oil and gas pipes, window ledges of buildings, poles, TV antennae and also trees. A few authors have reported that ravens (*Corvus sp.*) nest on pylons in some parts of the world (Steenhof *et al.* 1993, Bednorz 2000, Agiæ 2006). However, based on our literature survey, House Crow nesting on pylons has not previously been reported in India and adjacent countries.

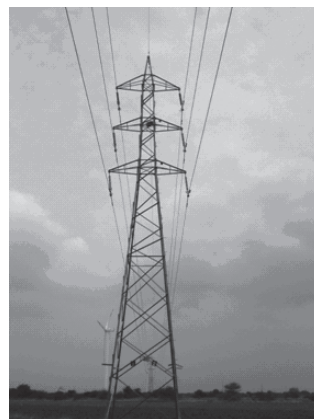
The preference of House Crows for using pylons for nesting in the study area may be due to lack of natural nest sites. Our basic vegetation survey of the area confirmed that there are no suitable nesting trees within a 200 m radius of the pylons. The tree species recorded in the area included *Azadirachta indica*, *Ficus benghalensis*, *Acacia nilotica*, *Balanites aegyptica*, *Delonix regia*, *Salvadora persica*, *Prosopis juliflora* and *P. cineraria*, none of which was observed to be more than 10 m in height. Thus, the pylons have provided suitable nesting sites for House Crows in the absence of natural sites. These new-found sites may allow the species to escape brood parasitism by Asian Koel *Eudynamis scolopaceus*, a common brood parasite (Ali *et al.* 2007), since the lack of vegetation may make it easier for the koels to be seen. It is also possible that sites on pylons



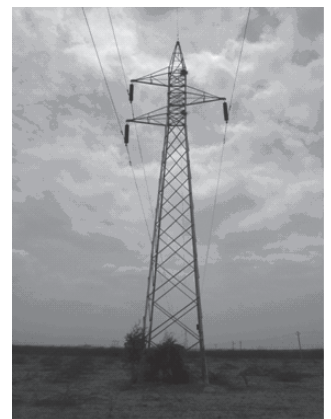
Type A



Type B



Type C

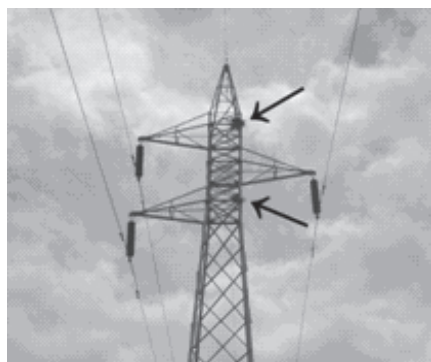


Type D

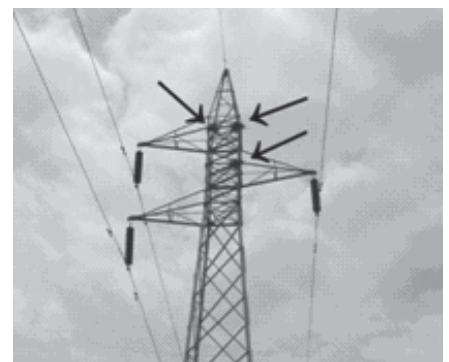
Plate 1. Types of pylons in the study area.



Single nest—placed in top console



Double nests—placed in bottom and top consoles



Triple nests—placed in middle and top consoles

Plate 2. Nest locations (indicated by the arrow) on pylons.

in this landscape where wind speeds are high may be cooler than those in other areas and have made it easier for the House Crows to adapt to these novel sites.

To fully assess the long-term costs and benefits to House Crows of locating their nests on pylons, further research on the nesting chronology (clutch size, incubation and breeding success) is needed as well as on the risks of collision with wires and electrocution on poles.

Acknowledgements

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New waterbird count data from the Heihe river in Gansu province, western China

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Introduction

The Heihe is China's second longest inland-draining river and lies within the Central Asian and East Asian–Australasian flyways for migratory waterbirds (Boere & Stroud 2006). No information on the Heihe is listed in the *Asian Waterbird Census 1987–2007* (Li *et al.* 2009), *Atlas of key sites for Anatidae in the East Asian flyway* (Miyabayashi & Mundkur 1999) or the *Asian-Australasian flyway site network* (DSEWPC 2009), and the river appears to be almost unknown in the international waterbird literature. Recent baseline species inventories (Chen *et al.* 2009, Zhangye City Government 2010) and a study of waterbird densities (Bao *et al.* 2012) established that the middle reaches of the river provide important habitat for waterbirds migrating across the arid regions of central-west China. Part of the river is designated an Important Bird Area, partly based

on a report of 'more than 20,000 waterbirds' (BirdLife International 2009). In the early 1990s a small waterbird reserve was designated along the middle Heihe, and in 2010 this was expanded and upgraded to the Gansu Zhangye Heihe Wetland National Nature Reserve (NNR) (Zhangye City Government 2010) (Figure 1). In 2011 wetlands in and near the Gansu Zhangye Heihe Wetland NNR were visited by MRB and waterbirds observed. New waterbird count data for the Heihe are presented and the international importance of the Heihe for waterbird conservation is discussed.

Study area and methods

From its headwaters in the Qilian mountains of Gansu and Qinghai provinces, the Heihe flows north across a vast, arid plain, the Hexi corridor in Gansu province (the middle Heihe c.330 km), then drains