

Short Communication

Competition on favourable nest location between Griffon Vulture and Bonelli's Eagle in Dana Biosphere Reserve

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Dana Biosphere Reserve holds a high diversity of raptors-whether residents or migrants due to the location at the eastern edge of Jordan Rift Valley, the hard terrain, and the variety in elevation from 150 meter below sea level at the western parts of the reserve in Wadi Araba up to 1500 meter above sea level at the eastern parts in Al Sharrah Mountains. Up to date, a total of 40 species of birds of prey were recorded in the reserve, eleven of which are known to breed annually (Evans & Al Mashaqbah, 1995).

This number of "top predator" indicates the relative richness and intactness of the ecosystem in the area of the reserve. A special monitoring program of breeding raptors was established by the reserve management in 1995 targeting the Egyptian Vulture *Neophron percnopterus*, Griffon Vulture *Gyps fulvus*, Short-toed Eagle *Ciraetus gallicus*, Bonelli's Eagle *Aquila fasciatus*, Verreaux's Eagle *Aquila verreauxii*, Lesser Kestrel *Falco naumanni*, and Eagle Owl *Bubo bubo*. The raptor monitoring program is performed using 12 vantage watching points (Fig. 1), all of which were selected based on the steep and broken slopes with ledges and crevices that enables a clear scanning of the facing cliffs with binoculars and telescopes from several different angles to locate nesting raptors (Evan & Al-Mashaqbah, 1995). Once a nest is located, watching for the arrival birds and the subsequent visits are documented from nesting to fledging.

A case of nest competition between two species was reported at one of the nesting sites in the reserve. A pair of Bonelli's Eagle was nesting in 2010 at the given nest (Fig. 2a) that was reused in 2012, and 2014 by a Griffon Vulture (Fig. 2b), with success breed of one chick per each pair of Griffon Vulture, and two checks for Bonelli's Eagle.

The nest competition between raptors is not unusual phenomena, it's recorded many times in many places of the world and between many species, for example: in Spain, Competition between: Bonelli's Eagle and Golden Eagle, Bonelli's and Griffon Vulture, Bonelli's and Peregrine falcon were recorded (Ontiveros *et al.*, 2008). In Europe, Eurasian Griffon compete extensively with Lammergeiers for nest sites (Fernández & Donázar, 1991; Margalida & Garcia, 1999; Bertran & Margalida, 2002).

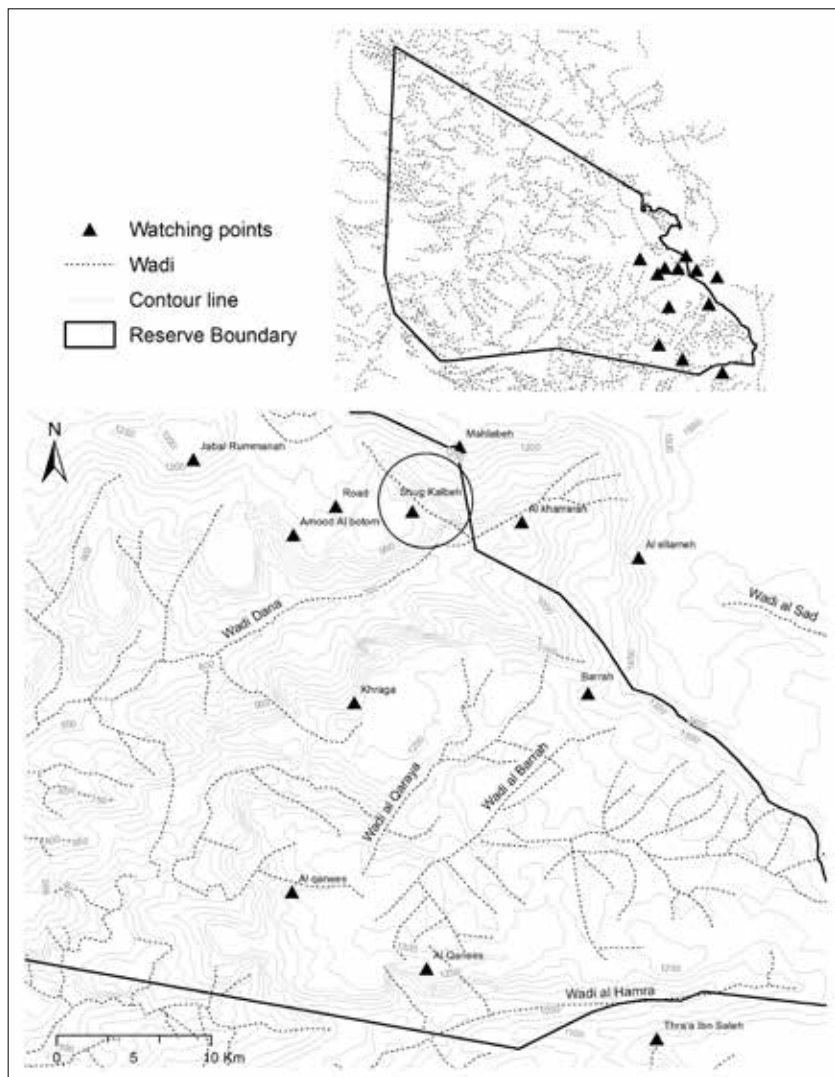


Fig. 1: Raptors survey viewpoints in Dana Biosphere Reserve showing the selected point in the black circle.



Figure 2: Bonelli's Eagle nest (a) in 2010, and at the same nest used by Griffon Vulture in 2014 (b), there is no available photograph for 2012 nest of Griffon Vulture.

Evidence of interspecific aggression at nest sites also has been observed between Eurasian Griffon and Cinereous Vultures (Blanco *et al.*, 1997), between Eurasian Griffon and Egyptian Vultures (Pascual & Santiago, 1991), and between Cinereous Vulture and Bearded Vultures (Aykurt & Kiraç, 2001). Four cases of European Magpie nests usurpation occurred within among different raptor species in Zuojiia Natural Reserve, northeast China. (Zhou *et al.*, 2009). All of these examples give clear idea about the level of competition between raptors on the suitable nesting sites which considered little based on the fact that the platform should contain many factors together to be suitable nest-site, like the heights, aspects, slopes, tree cover, wind direction and other factors.

Raptors are among the few groups of birds in which population size and breeding success are clearly limited by the availability of nesting sites (Newton, 1979). Dana Biosphere Reserve contain limited high platforms which suitable for raptors breeding. Griffon Vulture and Bonelli's Eagle are cliff-nesting raptors. As a result, nest competition could be recorded from time to time.

Competition on nesting sites in Dana Biosphere Reserve can be resulted when nesting sites became scares, exposed, and sometimes unsafe. In this case the nest of interest is located at the highest point of Wadi Dana in *Shag Kalbeh*, (Fig. 1) that reduces the needed effort for takeoff. On the other hand, the nest located exactly at the narrowest eastern tip of the wadi that is forming a bottle neck for uplifting winds. Finally, the nest direction took the advance of sun light where the nest is facing west / south so both shade and light options are available within the nest and for long period of time during the day. These three factors were the favourable conditions that cause the competitions on this given nest.

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