

## SHORT NOTE

### Use of wind farms by Australasian harrier (*Circus approximans*)

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Apart from assessment reports associated with resource consent applications, few studies have been published on the effects of wind turbines on New Zealand birds. A large amount of research has been conducted on the effects of wind turbines on birds in Europe and the USA (reviewed in Drewitt & Langston 2006). These studies have identified the key potential effects of wind farms on fauna as: (1) displacement due to disturbance; (2) barrier effects (alteration of migratory routes); (3) collision mortality; and (4) habitat change and loss (Drewitt & Langston 2006). Raptors are commonly cited as disproportionately affected by wind turbine collisions compared to other species (Osborn *et al.* 2000), with relatively high numbers killed. As raptors typically exist at naturally low numbers, a high mortality rate due to wind farms may have a significant impact on population size (Drewitt & Langston 2006). The high mortality rate of many raptor species on wind farms overseas appear to be due to either wind farms being located near high breeding densities or due to high number of bird passing through on migration (Madders & Whitfield 2006). Raptors may also become "fixated" on prey while hunting; such distracted birds are at risk should they fly through moving turbine blades (Madders & Whitfield 2006). Immigrant individuals and young birds may also be at particularly risk of bird strike associated with turbines (Drewitt & Langston 2006).

Given the recent increase in the construction of wind farms in New Zealand, it is important to determine the effects of these structures on native birds. Here we report observations on Australasian harriers (*Circus approximans*) at a wind farm in the central North Is. The Te Apiti Wind Farm is located on the north side of the Manawatu Gorge, 10 km from Palmerston North. The site is located across a wide ridge of rolling hills of the Tararua Range, which are used for primarily for agriculture. The wind farm consists of 55 Vesta 1.65 MW turbines. Each turbine is 70 m high, and fitted with 3 blades that are 35 m in diameter. The blade rotations minute<sup>-1</sup> vary according to wind speed, but have a maximum speed of 17 rpm. The turbines are electronically controlled, with microprocessors that automatically start, stop and monitor the turbines (Meridian Energy 2008). Three Australasian harriers were observed within the Te Apiti wind farm on a clear sunny day on the 30 Apr 2008 at 14.45 (4001735.79"S 1750 48120.25"E). The wind direction was north-west, with an estimated wind speed of 20-25 km hr<sup>-1</sup>. There was 80% cloud cover and no precipitation.

The 3 harriers appeared to consist of a single bird and a breeding pair. The harrier pair remained within 20 m of each other over a 20-minute observation period. The pair exhibited breeding behaviour, which consisted of frequent calling, and U-shaped diving. A 3rd harrier was sighted within the wind farm but remained at a minimum distance of 50 m from the harrier pair.

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All 3 harriers were seen flying at the height of the wind turbines throughout the observation period. Interestingly, all 3 harriers were also seen flying in the zone swept of the various turbine rotors multiple times (single bird 5 times; pair 10 times). A rotor blade was seen to touch the edge of a wing tip of one of the birds in the harrier pair, as it closely followed the other bird through the turbine. However, the bird recovered within 1 wing beat. All birds were at a minimum distance of about 100 m from the observers.

Our observations suggest two things. First, the presence of a wind farm does not appear to prevent the area being used by harriers, as they continue to occupy operational wind farm sites despite the disturbance created by the moving blades. Second, harriers may also show avoidance behaviour of turbine blades, although they might miscalculate if focused on prey, breeding, or are unfamiliar with the structures.

There are few published observations of the reaction of New Zealand birds, in particular harriers, to operational wind farms. Man-made structures, such as highways, have been observed to function as population sinks causing high rates of mortality in some species (Mumme *et al.* 2000). Sink habitats

may have a cumulative impact which can jeopardise meta-population persistence. Given the level of uncertainty surrounding the behaviour of native birds within wind farms at present, and the large number of new wind farms proposed throughout the country, there is an urgent need for further long-term and intensive studies to determine the impacts of wind farms on New Zealand bird species.

#### LITERATURE CITED

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