Tracking nomadic birds and habitat health

Roger Potts

Australian bustards fly great distances tracking changes in the landscape. They are particularly attracted to bushfires where they feed on fleeing invertebrates. These birds had flown in for a grass fire ignited by lightning strike in the Tanami Desert.

ADELAIDE UNIVERSITY researcher Mark Ziembicki is tracking the threatened Australian bustard, a large, nomadic bird of our grasslands and plains.

His study is using newly available satellite tracking methods to develop a model for species that will help predict the poorly understood movements and distributions of nomadic terrestrial birds in relation to landscape conditions. This should lead to better targeted conservation measures, and the possible use of nomads as indicators of habitat condition.

Data from Mars-bar-sized satellite transmitters attached to bustards, together with that from aerial surveys, bird atlases and mail surveys, are being overlaid on continental rainfall patterns, land condition indices, fire history patterns and management regimes to establish a picture of the bustard's movements and distribution over time.

This will reveal the ecological relationships between bustards and different fire regimes, land uses and land productivity at specific sites. Bustards appear to move readily, following rainfall and fire events in arid and semi-arid regions, and make more predictable seasonal movements, or are more sedentary, in other regions.

Further data should point to the strategies determining the initiation, orientation and termination of nomadic movements, which until recently were seen as unpredictable. It now seems that there may be underlying patterns to movements, so far undetected because of the inadequate scales of previous studies.

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The bustard (*Ardeotis australis*) has been heavily impacted by introduced predators, hunting and habitat alteration. Its decline is of concern to Aboriginal communities in northern and central Australia for whom the species is an important spiritual and food source.

If bird movements are deterministic and birds 'know' to some degree where they are going at particular times, then it may be possible to predict the locations of these destination areas, and target specific protection at key times. For example, local, feral predator control or hunting restrictions could be employed in favourable breeding areas, or any refuge areas required during drought.

This behavioural knowledge would facilitate wider predictive or pre-emptive conservation planning (by developing mobile or shifting conservation zones in time and space), thereby overcoming the limitations of current static reserve design and conservation strategies – a significant development in conservation practice.

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More broadly, defining the movements of nomadic animals could help position certain species as indicators of landscape and ecosystem health. Although no one species would be an ideal indicator, the potential usefulness of nomadic species as combined ecological indicators relates to their high mobility. Occurring over very large ranges, nomadic birds can potentially move vast distances, opportunistically tracking and choosing favourable areas, and by implication, giving an indication of ecological condition.

The bustard is an ideal species to illustrate this point in Australia's rangelands. It responds readily to the marked variability in habitats arising from rainfall variations, and its occurrence and abundance is likely to be related to fire management, grazing intensity, agricultural development and other variations in the landscape.

As satellite telemetry and spatial information system technologies become both more affordable and more efficient, similar tracking methods could be applied to a range of other declining, nomadic species, such as the flock bronzewing pigeon. This bird has suffered massive declines across its range since the turn of the last century, and yet there are no adequate population monitoring or conservation measures in place.

These research applications have the potential for not only aiding conservation but of highlighting the broader implications of linking natural resource management at local, regional and national scales.

Mark Ziembicki's project recently won a 2003 Science and Innovation Award for Young People in Agriculture, Fisheries and Forestry and is part of a PhD in progress, supported by the Herman Slade Foundation, CRC for Tropical Savannas Management and Land and Water Australia.

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