Raptors and rodent control in the Mongolian Steppes

he guide books often describe the Mongolian steppes as a pristine wilderness and it certainly is a landscape of wide open spaces "where the grasslands stretch across the horizon to meet clear blue skies", but spend some time in this place and you will soon realize that the steppe grasslands are a place where Mongolians live and work. Far from being a wilderness, you are never too far from a herdsman's encampment and the grasslands are heavily grazed by herds of horses, sheep and goats. The steppe grasslands of Mongolia are in fact one great big grazing pasture extending over 117 million ha, covering approximately 75% of the nation's territory and it's not



Brandt's vole



Nomad enampment

as 'pristine' as it first appears to be.

The Gobi Desert of southern Mongolia is expanding northwards and encroaching on the steppe grasslands of central Mongolia. This process of 'desertification' may be indicative of global climate change and the long-term, inexorable expansion of the desert is hastened by short-term weather conditions and biological processes associated with grazing. Herders from southern regions are forced north to use pastures where competition for grazing space is already limited. Incomes from livestock grazing are low and the options for impoverished herders are limited. They can leave the pastures and live in the city, as many have already done - the capital Ulaanbaatar is now home to over one million people. Those that stay in the countryside can increase the size of their herds and switch to producing more valuable livestock, such as goats for the cashmere trade. This has lead to significant degradation in the quality of the steppe grasslands. Overgrazing creates conditions that

result in large population increases of rodents such as Brandt's Vole and Mongolian Gerbil, as well as of insects such as grasshoppers; all of which eat the grass and further exacerbate grassland degradation and hasten the process of desertification.

Project development

It is against this background of rural poverty and habitat degradation that International Wildlife Consultants (UK) Ltd (IWC) has been developing a project to increase the breeding population of birds of prey in steppe habitats using artificial nests. In the flat and undulating plains of the Mongolian steppe there is an abundance of rodent prey for raptors but a shortage of suitable nesting sites. Some species, such as Upland Buzzards and Steppe Eagles will readily nest on the ground but other predatory birds like Kestrels, Ravens and Saker Falcons require elevated nesting sites (though Sakers will very occasionally nest on the ground). These raptors readily take to

by Andrew Dixon, International Wildlife Consultants (UK) Ltd.



Artificial nest and dust storm

nesting on various human artefacts in the steppes, such as livestock shelters and buildings and power-line poles, so the initial step in this project was to create new elevated platforms where species such as Ravens and Upland Buzzards could build their nests. This initial trial, established by Eugene Potapov and Gombobaatar Sundev, was successful. Ravens and Upland Buzzards built their nests on top of the 2 m high metal tripods that were erected at intervals across the flat steppe and some of these nests were subsequently usurped by Saker Falcons; it was established that simple artificial structures could be purposely constructed to encourage these species to breed.

Nests out of metal drums

The next step was to refine our design, to maximise the levels of occupancy and to optimise breeding success. In the autumn of 2005 we erected a grid of 100 artificial nests made from old metal drums bolted to a 3 m pole and fixed in the ground with a concrete base. These boxes, placed 2 km apart, all had a lining of gravel so that they were immediately suitable for use by Saker Falcons. We tested four different designs of nesting box, distributing them randomly across our grid. Three designs were opentopped and differed in the degree of shelter afforded to nesting birds; one had a low rim so that nesting birds could see all around, another had a high rim so that the nests were totally protected from the strong winds that constantly blow across the steppes, and the third design had a high rim on one side only, affording some protection from the wind and some visibility for the incubating bird. The fourth design was a closed-box with a roof and a large side-entrance. Over the following years we monitored occupancy and breeding success of the species using the different box designs. Occupancy levels increased year on year, as breeding birds were recruited annually into this newly created nesting habitat. There were three main species that used our nests: Upland Buzzards, Ravens and Saker Falcons, though one pair of Golden Eagles also laid an egg that failed to hatch in one of our barrels! The Upland Buzzards showed a strong preference for nesting in any open-topped design but they filled each type with nesting material so that they had full visibility but were exposed to the strong winds. Conversely, Ravens and Saker Falcons exhibited a preference for nesting inside the closed-boxes.

In order to maximise the likelihood of one of these species occupying a nest



Biologists studying rodents

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Putting up artificial nest

we modified our nest box design in a new grid of 150 artificial nests, which was completed in 2007. These nests were placed at much closer intervals, only 1 km apart, in six blocks of 25 nests distributed over a wide area where there was an abundant population of Brandt's Voles and Mongolian Gerbils. The nests were all closed-boxes that incorporated a narrow rim on the roof where Upland Buzzards could also build their nests; now each box was suitable for any of the species that might want to breed there. Working with our Mongolian research partners at the Wildlife Science and Conservation Center (WSCC), we have stepped-up our research effort to examine the potential of using birds of prey to control the numbers of rodent pest species in degraded grasslands. In 2007, Nayambayar Batbayar, Director of WSCC, recruited two Mongolian graduate students and we funded and co-supervised them through a two-year Masters-level program at the National University of Mongolia. Ganhuyag Purev-Ochir studied the breeding ecology and reproductive success of the birds of prey, whilst Amarsaikhan Saruul undertook a demographic study of the rodent population. To date we have been working with a team of Mongolian students and foreign field assistants to collect prey remains and pellets in order to study the diet of breeding raptors. In 2009 we used GPS satellite telemetry to determine the hunting ranges of Saker Falcons.

Occupied nests

In 2009, an incredible 95% of these artificial nests were occupied by birds of prey, comprising 27 Upland Buzzards, 16 Saker Falcons and nine Ravens, with the remainder occupied by Common Kestrels. All of these species fed predominantly on rodents, especially Brandt's Voles and Mongolian Gerbils and preliminary analysis indicates that these two species made up 86% of prey items taken by Saker Falcons nesting at our grids. The GPS satellite telemetry has enabled us to plot the hunting ranges of our Saker Falcons, and during the breeding period the tagged birds hunted over small ranges surrounding their nest sites, indicating that these rodents are killed in the vicinity of the artificial nests.

The high density of breeding raptors, all feeding predominantly on the local rodent population demonstrates the potential of using artificial nests to increase raptor predation as a form of biological control of rodents. This approach is directed at the 'symptoms' of grassland degradation rather than the 'causes' (which are multiple and complex), but nevertheless still offers conservation benefits for birds of prey and local herdsmen. We still need to undertake further research to quantify the number of rodents taken by birds of prey and to assess the impact of this level of predation on the rodent population.

This research project is ongoing; our two Masters students have graduated and are now employed full-time on the project whilst the next generation of graduates will be enrolled on Masters level courses in 2010. We are committed to 'capacity building' and training of Mongolian biologists, an essential process if we hope to secure the long-term



conservation of Mongolian birds of prey. Whilst IWC and WSCC work together to implement this project, the funding comes from falconers in Abu Dhabi, through the Environment Agency Abu Dhabi and the Emirates Falconers Club. Their commitment and support for the work in Mongolia cannot be overstated. The Mongolian government are aware that while many other fixed-term conservation projects are started they soon disappear when the funding stops, having little lasting value or legacy. The continued commitment and long-term investment in conservation research shown by the falconers of Abu Dhabi has not gone unnoticed by the Mongolian government and enables us to enter discussions with policy makers with a degree of credibility and influence. In Mongolia, falconers have sown the seeds and are now seeing the benefits of their commitment to conservation and research work on birds of prey.

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