

## Evaluating the Quality of Protected Areas for Species: A Case Study in Ikh Nart Nature Reserve, Mongolia

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### Abstract

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Species' distributions reflect the quality of landscape conditions, and represent an important component of protected area management. However, distributions are difficult to estimate, and consequently, often determined through a combination of limited field data and expert opinion, which may lead to biases. We demonstrate the use of occupancy models to map distributions and estimate landscape quality. We used occupancy models for two species, the red fox and toad-headed agama, to map their distributions in Ikh Nart Nature Reserve located in southeastern Mongolia. We then used occupancy probability as a measure of quality and tested whether differences existed in quality between three areas: 1) inside the reserve, 2) inside the reserve's core protected area, and 3) outside the reserve, using 30 sample sites in each. Occupancy probability varied from 0.084 to 0.997 for red foxes and 0.022 to 0.949 for agamas in maps. Landscape quality was highest in the core area and lowest outside the reserve for red foxes, and highest outside the reserve and lowest in the core area for agamas. Our results provide visual depictions of distributions across the Ikh Nart landscape and a means of assessing the quality of the Ikh Nart protected area that may inform management activities.

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### Introduction

Mongolia has an extensive protected area system that includes nearly 100 areas covering approximately 27 million hectares or 17% of the country, which reflects a national commitment to conservation. Protected areas in Mongolia have several goals, one of which is to protect individual species. Some protected areas have even been created primarily for this purpose. For example, the Ikh Nart Nature Reserve in

Dornogobi *aimag* (province) was established in part to protect one of the largest remaining argali sheep (*Ovis ammon*) populations in the country (Myagmarsuren, 2000). Argali have been promoted as a flagship species for generating public support for the region and umbrella species for broader biodiversity conservation (Reading *et al.*, 2011). Other protected areas have used a similar approach (e.g. Hustai National Park and