

Developing technologies for habitat evaluation and a method of efficiently monitoring rare raptors

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1. Foreword

As part of the environmental assessment of public works (e.g., road, dam, rail, and power plant construction projects), raptors are often surveyed and evaluated as an environmental-indicator species. However, their evaluation requires a lot of time and work, because an efficient method of habitat evaluation and monitoring of raptors has not been established. Thus, we conduct research to find and develop an efficient method.

2. Developing habitat evaluation methods

We try to construct and validate prediction models based on a statistical approach to evaluating habitat quality (i.e., species distribution model: SDM). SDM is derived from the relational expression between the pattern of species location (occurrence/absence data) and environmental factors calculated using GIS (e.g., land use and features) in landscape scale (Fig. 1).

We assembled a database by extracting the location of raptors' 1800 nests from over 500 reports of biological

surveys in nationwide road projects during 2009-2012. At present, we are trying to validate SDMs with high prediction accuracy, and estimate the environmental factors important for the conservation of rare raptors (Fig. 1). In addition, we predicted the potential maps of raptors' nesting habitats using SDMs (ex. Fig.2).

3. Future development: efficient monitoring

In recent years, new monitoring techniques for aerial animals are rapidly developing (e.g., Radar, Full spectrum camera, bio-logging technologies). Thus, we will try to efficiently monitor raptors using these techniques and SDMs.

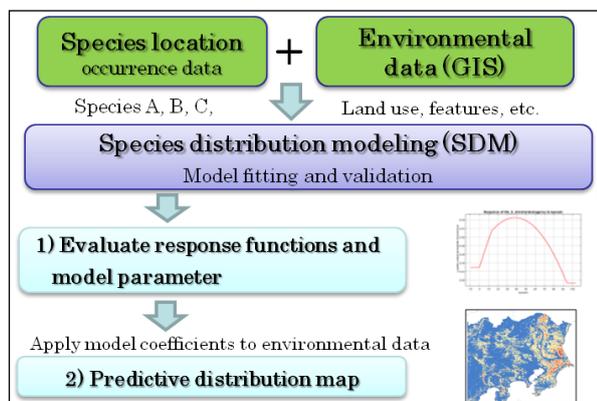


Fig. 1: The steps in SDM and predictive mapping.

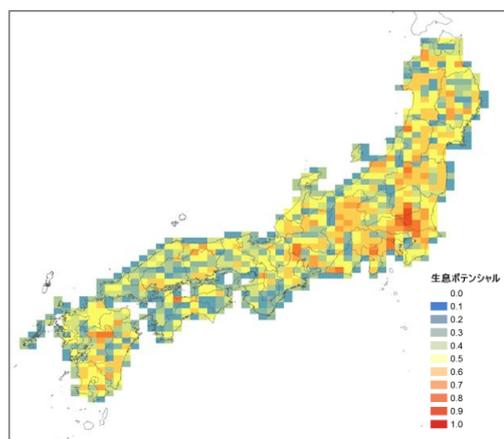


Fig. 2: Potential map of Goshawk nesting site predicted using SDM. (Red: high quality site, Yellow: medium, Blue: low)