Vanishing with the Grasslands:

Breeding Habitat Suitability Analysis for the Bengal Florican (*Houbaropsis bengalensis blandini*) In Cambodia

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A Little known Bustard

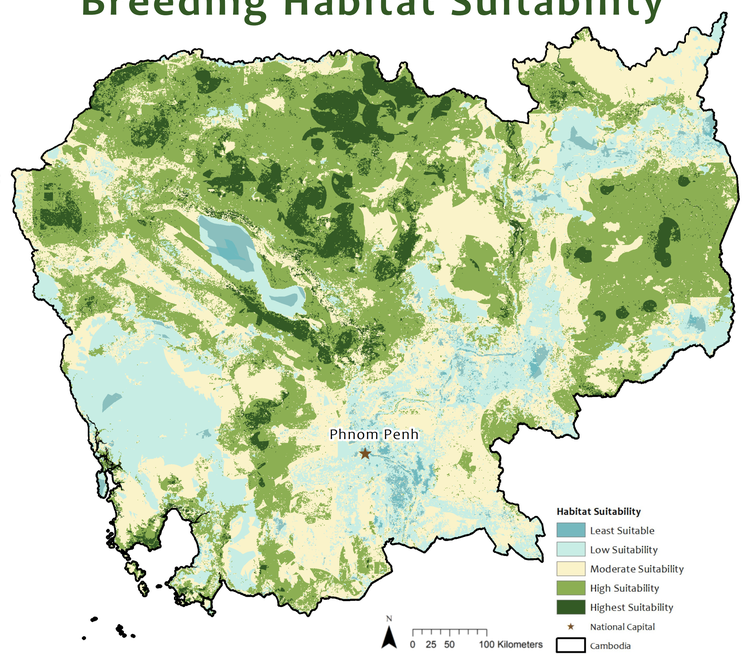
The bengal florican (*Houbaropsis bengalensis*) is a bustard found in tropical grasslands in Cambodia, India, and Nepal. The breeding habitat of the florican are disappearing in all regions as a result of habitat loss. Other threats to the florican include hunting, pesticide exposure, and other human disturbances. Currently there are approximately 900 individuals, 60% of which reside in Cambodia and are considered a subspecies. The florican is currently listed as critically endangered under the IUCN Red List.

Determining suitable habitat for the florican is key to ensuring their survival as tropical grasslands disappear. Preservation of habitat by creating protected land throughout Cambodia can help sustain and increase the current population. A breeding habitat suitability analysis will be conducted to determine if there is adequate areas for protection within Cambodia.

Factor	Weighted Score	Least Suitability	Low Suitability	Moderate Suitability	High Suitability	Highest Suitability
Distance to Protected Land (m)	25%	27,885 to 104,569	13,492 to 27,885	6,151 to 13,942	0 to 6,151	Within protected land
Land Cover	25%	Water, snow, ice, forest, urban	Closed shrubland, barren or minimal vegetation	Croplands, open shrubland, woody savanna	Crop/mixed vegetation	Grasslands, savanna, wetlands
Distance to Wet Rice	20%	0 to 3,500	3,500 to 12,000	12,000 to 30,000	30,0000 to 75,000	75,000 to 104,910
Elevation (m)	10%	-5 to 4	800 to 1744	150 to 800	40 to 150	4 to 40
Poverty Rate	10%	0 to 7.9	8.0 to 16.3	16.4 to 21.2	21.3 to 26.7	26.8 to 38.6
Distance to Power Lines (m)	10%	0 to 3,000	3,000 to 6,000	6,000 to 10,000	10,000 to 20,000	20,000+

Table 1. Factors analyzed to determine breeding habitat suitability for the bengal florican (*Houbaropsis bengalensis blandini*) in Cambodia.

Breeding Habitat Suitability



Methodology

Six variables were analyzed to determine the highest habitat suitability. Euclidean distance analysis was conducted for rice crops, protected land, and power lines. Raster to polygon analysis was conducted for the poverty rate. All of these variables along with elevation and land cover were reclassified with the raster calculator tool and a weighted suitability analysis was completed. See Table 1 for specifics on grading.

Is there hope for the florican?

The breeding habitat suitability analysis revealed large areas of adequate habitat. Within these areas the grassland is still minimal and more needs to be done to improve upon the available habitat. Continuing to harvest wet season rice will help increase breeding habitat. Creating an industry of florican friendly rice can increase the farmer's income.

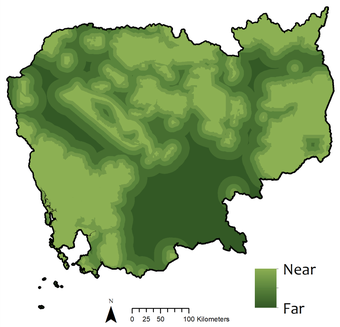
Projection: WGS 1984 UTM Zone 48N

Data Sources: Open Development Cambodia; Global Administrative Area (GADM); Global Land Cover Facility; ESRI Data; Global Land Cover; Gfk.

Photo Sources: alchetron.com, Bengal Florican Reserve, Indian Birds

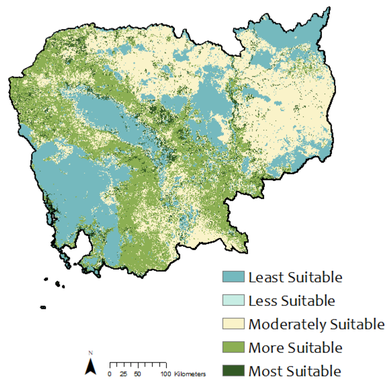
Acknowledgement: Thank you to Carolyn Talmadge and Annie Nguyen for their support, guidance, and patience.

Protected Land



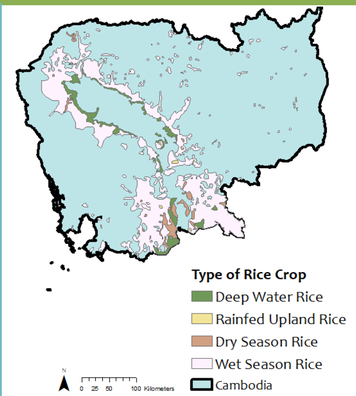
Protected land can be found throughout Cambodia under a variety of entities and for multiple purposes. Any protected land can increase the suitable habitat for the bengal florican and protect them from human disturbance. Suitable habitat near protected lands increases the potential breeding habitat the birds can utilize.

Land Cover



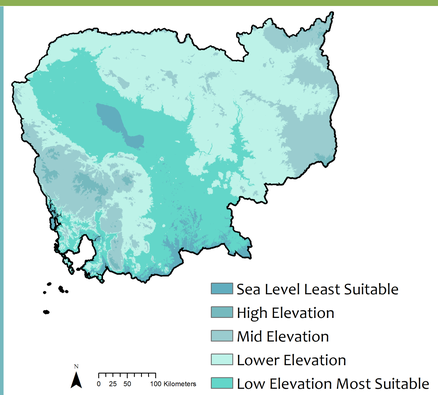
Bengal floricans breed in grasslands. As more grassland is converted to cropland the breeding ground for this bird is depleted. Some agricultural land can be used for breeding such as the dry season rice fields.

Rice Crop



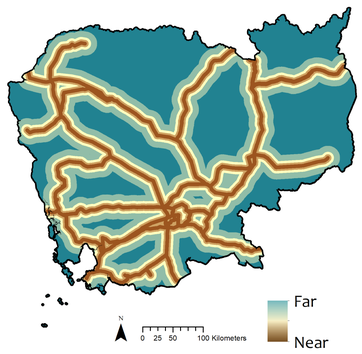
In recent years there has been an increase in accessibility to irrigation systems in rural Cambodia. This has caused a shift from one wet season rice crop to one or two dry season rice crops. The dry season rice crops are seeded and harvested during the bengal florican breeding season. This can disrupt their nest productivity and cause them to leave their breeding grounds.

Elevation



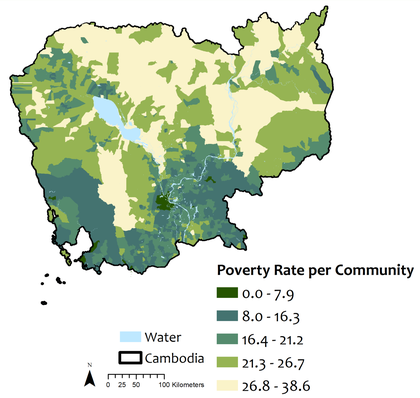
Bengal floricans utilize grasslands in Cambodia that are found in relatively low elevations. Some of the lowest elevations in the country are at the coastline and around wetlands. These areas are less suitable for nesting and would not be their prime breeding grounds. Areas just higher than sea level are ideal for breeding habitat.

Power Lines



Power lines have been shown to kill bengal floricans in Nepal. While there is not currently data on bengal florican and power line collisions in Cambodia this could be a potential cause of population decline in the region. Ensuring the birds have adequate habitat away from power lines will decrease the chances they will collide with the lines.

Poverty Rate



Rice crops are commonly grown in low income areas. Many of the farmers are moving to producing wet season rice crops as they believe their income will increase. What the research is showing is the opposite and that farmers are losing more income by growing and harvesting two dry season rice crops. Moving back to a wet season rice may increase their income and would be more beneficial to the bengal florican.