Red List status of Caribbean forest endemic birds: extinction risk and data bias

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Background

• Extinction prone species
  • Island endemics
  • Forest-dependent

• 171 Caribbean forest (regional) endemic birds

• 26% threatened with extinction

• 29% of threatened have active species management (IUCN data)
Management challenges

• Regional governments - limited human and financial resources

• Accelerating loss and degradation of habitats from development

• Direct and indirect impacts of overexploitation

• Threat of climate change

• Limited published data on population status of species
Key Questions for Conservation Triage

• Are species that should get attention, getting attention?

• Are data we need to manage available and being published?

• What is the quality of data, if it exists at all?
Aims - Where are gaps in knowledge?

• Understanding extinction risk is key in triage of Caribbean endemics:

  • Is there life history bias in extinction risk and research effort?

  • Is research effort different for threatened species vs. non-threatened endemics?

• What are conservation implications of existing data gaps?
Methods – predictors of extinction risk

• Life history predictors of extinction risk
  • Phylogenetic generalised least squares (PGLS)

• Response variables:
  • Extinction risk

• Explanatory variables:
  • Forest dependency (low, medium, high)
  • Mean clutch size
  • Mean body mass
  • Generation time (years)
  • Maximum elevation
Methods – Data bias and quality

• BirdLife (BL) Data Zone estimates of data quality

• Systematic review of Web of Knowledge and Journal of Caribbean Ornithology (1988-2016)
  • Research effort: N studies per species

• Data bias related to life history and taxonomic extinction risk
  • BL data quality of population trend estimate vs. RL status and order
  • Phylogenetic generalised linear mixed model (PGLMM) of research effort ~ life history traits
  • Expected vs. observed studies for threatened species per order
Results - Life history and extinction risk

- PGLS Best fitting model: Phylogenetic signal, $\lambda = 0.48$
BirdLife data quality of population trend

Red List Status
- Population Trend: decreasing, stable, increasing, unknown

Proportion of species
- Good, medium, poor, none

Proportion of category
- CR, EN, VU, NT, LC
Data quality of population trend and RL status
BirdLife data quality of population trend vs order
Research effort by Extinction Risk

• Mean number of papers published per species, 1988-2016:
  • WoK: 6.02 ± 11.01 (n = 988);
  • JCO: 4.52 ± 4.88 (n = 742)

Kruskal Wallis: $\chi^2 = 5.85$, df = 4, p = 0.21
Research effort – life history bias
Expected vs. Observed literature – order bias?

- Expected # studies given threatened endemic species per order

*Only orders with threatened species*
Results - summary

- High forest dependency predictor of extinction risk but not research effort

- Extinction risk not an indicator of research effort
  - but....

- Species with active species management – more data and higher confidence in data

- Paucity of data for least concern species
Summary – what it means

• Traditional triage approach: the plight of common species
Summary – what it means

• Long-term monitoring - population estimates, demography, impacts of conservation actions

• Role of BirdsCaribbean/JCO
  • Strength of regional journal – small-scale studies, single site, distribution data [eBirdCaribbean]; Potential as data repository
  • Endemic Bird Festival

• Study limitations
  • Missing life history data for PGLS/PGLMM
  • Analysis of temporal change in RL status and population trend
  • Measure of unpublished literature and money spent on conservation
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- Data sources: IUCN Red List; Birdlife Data Zone; Cornell Neotropical Birds Online; Handbook of the Birds of the World; Dunning, CRC handbook of avian body masses; Myhrvold, Amniote life-history database; BirdTree.org