Removing guess in EIA: a cross-continent analysis of fatalities at windfarms

Paulo Eduardo Cardoso
Bioinsight
Portugal
paulo.c@bioinsight.pt

https://www.bioinsight.pt/
Population Viability Analysis

Quantification of the impact

EFFECT  ≠  IMPACT

contribution to EIA

Valid tool
Scarcely used

Upscale evaluation
What **PVA** brings?

- **Main advantages**
  - Quantification over a more qualitative (subjective) assessment

- **Main drawbacks**
  - Model requirements
  - EIA stage might not be “ready” to deal with such outputs

- Depends on maturing of the EIA process
The approach

Different maturing of the EIA process

Quantitative measures

- Fraction of affected population
- Probability of extinction

Space-implicit
Age-structured
Stochastic model

@Kevin Payraw
Real scenarios of fatalities of birds at wind turbines
Real scenarios of fatalities of birds at wind turbines

Reassessing
Fatality estimated
Fill data data gaps

Planning
EIA process
Fatality estimates

@Kevin Payravi
Real scenarios of fatalities of birds at wind turbines

Planning
EIA process
Fatality estimates

Reassessing
Fatality estimated
Fill data gaps

Reassessing
Improve monitoring
Fatality estimates
Real scenarios of fatalities of birds at wind turbines

- Planning: EIA process Fatality estimates
- Adapting: Incorporate PVA
- Reassessing: Fatality estimated Fill data gaps
- Reassessing: Improve monitoring Fatality estimates
- Adapting: Incorporate PVA
Harvest
Biological
Demography
Harvest

RUN PVA

01 Extent 02 Demography 03 Mortality 04 Population size 05 Model run
<table>
<thead>
<tr>
<th>SPECIES</th>
<th>MORT. RATE</th>
<th>N BEFORE IMPACT</th>
<th>N AFTER IMPACT</th>
<th>POP. REDUCT. (%)</th>
<th>PROB. EXTINC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coragyps atratus</td>
<td>0% - 2%</td>
<td>13187 - 98578</td>
<td>9039 - 97134</td>
<td>5% - 31%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Scenarios of population reduction for *Aquila verreauxii*
Main challenges

Old studies
European species only
Estimators variety
Inadequate monitoring protocols
Fatality estimates
Population size
Model complexity

Biological parameters
Lack of estimates
Demographic parameters

Main challenges
Main challenges

- Location is not an impediment
- Timing has to be aligned with licensing process
- Not all species will be equally impacted
- Accommodate Uncertainty
PVA still scarce in EIA assessment

Complex methodology

ability to recognize the limits of the analysis

Improving the approach requires collaboration
Effects remain

population reduction

Important to not neglect

Deal with residual impacts
MAIN CHALLENGES

- Industry
- Consultancy
- Population size and biological parameters
  - Promote studies
- Academics
  - Conduct studies
  - Model development
  - Model recommendations
- Authorities
  - Guidelines
EIA process can be optimized

- PVA analysis
  - Review existing data to create new information
    - Following the PDCA

More stakeholders involvement

- Debate
  - Agreeing on acceptable uncertainty
    - Improve analysis

Uncertainty

- should not be an obstacle to perform a PVA
  - Instead, it is an important assumption which must be properly considered
Thank you!
Let’s continue the conversation!
Post questions and comments via chat in the IAIA21 platform.

#iaia21