Bird Biological Parameters

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What is being covered?

• Approaches and resources required for modelling
• Highlight key references for parameters (e.g. flight speeds, bird lengths, nocturnal activity, PVA)
• Specify changes/updates from previous Rounds (has evidence significantly changed to justify updates to flight speed, height, nocturnal activity).
• Emerging / new papers or issues
For Collision Estimation

Flapping or Gliding flight?

Gliding is more precautionary. ‘Famous’ gliders are large Procellariformes. Gannet is modelled as gliding, other species as flapping. There is no particular reference for this, has been agreed through dialogue prior to assessment.
For Collision Estimation

How Big is the bird? Both wingspan and body length required. Bird size varies between individuals, with often bi-modal (sexual) distribution for a species.
For Collision Estimation

How Big is the bird?

Shiny App has values already included (origin of these values not clear).

Band Spreadsheet (deterministic) takes values from BTO bird facts.
For Collision Estimation

How fast is it flying?

Flight Speed is an important parameter for collision risk estimation.

Bowgen and Cook gives flight speeds in Table A1 – ‘True’ and ‘Straight Line’

2 sources of flight speed (until recently)
Alerstam et al 2007
Pennycuik 1997

Pennycuik has estimates for many important species (in UK context).
For Collision Estimation

How fast is it flying?

True speed should be used for ‘blade crossing’ speed. Incorporates some behavioural aspects. Straight Line speed should be used for ‘flux’ calculation.

ORJIP BCA study (Skov et al 2018), at Thanet OWF measured flight speeds by Radar and Laser rangefinder. ‘In the field’ measures and comparatively large sample size.

Skov estimates reduce collision predictions.

A new source - BTO NERC tracking data for CRM project (nearing finalisation).
For Collision Estimation

How high is it flying?

Masden (2015) showed that flight height is as important as avoidance rate in the overall risk calculation.

At sea flight heights have proved difficult to gather. LIDAR appears to offer a technologically robust method, but is only ‘proof of concept’ at this stage.

Flight height curves from Johnston et al 2014 for generic use.

Project specific flight heights can still be used. Full evaluation required of method.
For Collision Estimation

Nocturnal or Diurnal?

Some birds are more active after dark than others, but most are substantially less active than during the day. Therefore, in theory, collision risk is lower at night.

For gannet this is complete (Furness et al. 2018).

8% breeding season, 3% non-breeding season.

Increments of 25%, so 0% for model input.

Other species yet to be fully reviewed

GPS and accelerometer data is becoming available to reveal how much nocturnal flying different species do.

Astronomical twilight (Forsythe et al. 1995)
For Population Modelling

The Population Model (PVA) is required to provide metrics for assessment. SNH wish to see ratio metrics (‘counterfactual’ of final population size and ‘counterfactual’ of population growth rate).

NE PVA tool
http://publications.naturalengland.org.uk/publication/4926995073073152

CEH / MS regional models

To fit Semi-Integrated Population Models (SIPM) a good level of data completeness is required. May not available for all colonies.

Bespoke models – using demographic information from Horswill and Robinson (2015). BTO 667
Thank you