Analysis Hints

Taken (largely) from:

- Section 2.5 of Buckland et al. (2001) Introduction to Distance Sampling
- Thomas et al. (2010) Distance software: design and analysis of distance sampling surveys for estimating population size. Journal of Applied Ecology 47:5-14.

Analysis hints

This is not a cookbook!

Do not simply use the programme defaults in Distance!

The art of model selection

Analysis hints

Stage 1: Exploratory data analysis

- Goal is to understand patterns in distance data, and make preliminary decisions about analysis
- It is never too early to start looking at the data (can then rectify problems)
- Exact data: examine QQ-plots and histograms with lots of cutpoints (in Distance, use Model Definition | Detection Function | Diagnostics)
- Carry out preliminary analysis with a simple model (e.g. half normal, no adjustments). Examine histograms to assess if assumptions are violated
- Make preliminary decisions about truncation and whether to group exact data (Use Data Filter | Intervals)
- For clustered populations, look for evidence of size bias (see Clustered Populations lecture).

Analysis hints

Stage 2: Model selection

- Decide whether to analyse the data as grouped or ungrouped
- Select appropriate truncation distance.
- Choose cutpoints if using grouped data.
- Select and fit a small number of key/adjustment combinations
- Check histograms, goodness-of-fit, AIC and summary tables and choose a model
- This is an iterative process – more exploratory work may be required.
- Check evidence of size-bias if population is in clusters

Analysis hints

Stage 3: Final analysis and inference

- Select best model, or
- Perhaps use model averaging - bootstrap with more than one model selected if model choice is uncertain and influential
- Extract summary analyses and histograms for reporting