R script files to accompany
Integral Projection Models for Species with Complex Demography
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The .R files in this archive are text files that can be viewed in a text editor and run by copying into an R console, or loaded into a session as scripts (e.g. with File/Open Script in the Windows GUI). Most of them can also be sourced from the R command line. Each file includes extensive comments that try to explain what's happening step-by-step.

Three files are included to illustrate the methods suggested in Appendix A of the paper. We hope that these are clear enough for you to use as a template for your own IPM calculations, after modifying the definition of the kernel to correspond to your model. If not, please let us know – we may be able to help you adapt them for your needs.

- `AgeSizeIPM.R` implements an age×size structured model with a finite maximum age, using component matrices for forward and transpose iteration. It is based on the *Onopordum* model, eliminating the quality variation among individuals. Working through this file is suggested as a warmup before you try to read `RunOnopordumModel.R`.

- `CompareSensitivity.R` illustrates the calculation of sensitivities and elasticities by perturbing the matrix, using the speedups suggested in Appendix A. The results in Appendix A about the accuracy of elasticities by perturbation were obtained with this script. For the sake of simplicity the model used here is a basic size-structured IPM.

- `SizeQuality.R` implements a size×quality structured model. The model used in this script is based on the size-structured model in `CompareSensitivity.R`, and adds a dynamic quality variable with linear autoregressive dynamics.

We also include three archival files to document calculations in the paper. So as to accurately present how we obtained the results in the paper, apart from adding comment lines we have not made any changes to make these scripts more user-friendly.

- `FitOnopordumModel.R` includes the regression-model fitting commands for the final model. You can't run this file because it depends on data files that are not included here.

- `RunOnopordumModel.R` does most of the calculations shown in Figures 1-4 of the paper. It should run for you, using the parameter values defined at the top of the file (rounded from the estimates used in the paper).

- `ChangeOffspring.R` does the calculations for Figure 5, using in part functions defined in `RunOnopordumModel.R`.

The scripts used for Figure 6 in the paper are not provided. They are not user-friendly and depend on a 56Mb `.Rdata` file with bootstrap output. Contact SPE if you really want to see these, but they come with no guarantees or support.