DARR 2.0.2: DARR for R

Addendum to NOAA-TM-NMFS-SWFSC-368[1]

DARR (Darroch Analysis with Rank Reduction) 2.0.2 updates[2] a software application for estimating abundance from stratified mark-recapture data. This update implements a substantive change to the algorithm-estimator that was inadvertently omitted during the change from DARR 1.0 to DARR 2.0[3], and ports DARR to the statistical language R[4]. As such, this update augments the existing users' manual, and the users of DARR should continue to cite Bjorkstedt (2005) in addition to this Addendum[5].

To use DARR 2.0.2 requires that R be installed and correctly configured. DARR 2.0.2 uses and produces the same data file formats as previous versions of DARR, so data preparation should follow directions given in Bjorkstedt (2005). Once data are ready for analysis, running DARR requires the two steps. First, at the command line in the R console, type

```
source("DARR_v2.02_R.r")
```

to load DARR into the R workspace[6]. Users of editor programs[7] that link to R will have GUI-based options for accomplishing this step. Second, run DARR by typing

```
Darr_R()
```

at the R command line.

Once invoked, DARR will open a window for navigating to the directory (folder) in which mark-recapture data are stored. After selecting the appropriate directory, click on "OK" to proceed. DARR will then open a window listing all comma-separated-value (.csv) files in the selected directory. Select the desired data file, and, if necessary, click on "Open".

DARR prints the mark-recapture data to the R command window for review, but there is no longer an option to edit the data within DARR. If errors are noticed, the analyst should exit DARR by typing a `<ctrl>-c`, make necessary corrections to the data file in a text editor or spreadsheet software, and restart DARR to proceed with analysis.

Display of the mark-recapture data is followed immediately by a prompt to enter the number of traps used in the mark-recapture experiment (1 or 2; see Bjorkstedt (2005) for details). Directly following entry of the number of traps, DARR will ask whether any strata are to be pooled *a priori*. If no strata are to be pooled *a priori*, the analyst should simply hit return, and analysis will proceed as described below. Otherwise, strata to be pooled should be entered as a series of numbers, either all in one line separated by spaces, or as single entries. A blank entry terminates the set of strata to be pooled *a priori*.

With this information, DARR proceeds to implement the pooling algorithm-estimator, and produces three forms of output. First, estimates of total abundance and the standard error of this estimate are printed to the R workspace. Second, a plot of estimated abundance per stratum is produced, with sets of pooled strata indicated by black bars at the top and bottom of the plot. Third, a comma-separated-value (.csv) file with all of the output provided by previous versions of DARR is written out. As with previous versions, DARR 2.02 includes the original data at the top of the output file in a form suitable for later re-analysis.

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[1]Released 7 December 2009; revised 2 March 2010.

[2]The previous version of this software is described in Bjorkstedt, E. P. 2005. DARR 2.0: updated software for estimating abundance from stratified mark-recapture data. U.S. Depart. Commer., NOAA Technical Memorandum NMFS-SWFSC-368, 13 p.

[3]The third change noted in Bjorkstedt (2005), regarding how strata are selected for pooling to reduce the condition number of the recapture matrix is now implemented correctly.

[4]http://www.r-project.org/; see http://cran.r-project.org/ for download and installation instructions. Note that use of specific products herein does not imply endorsement by NOAA's National Marine Fisheries Service

[5]Cite as Bjorkstedt (2010) DARR 2.0.2: DARR for R. http://swfsc.noaa.gov/textblock.aspx?Division=FED&id=3346

[6]Ensure that the working directory of R is set to the folder where the DARR program resides, or to provide the full path to the DARR program in the `source` command; see the help files for the commands `getwd()` and `setwd()` as needed.

[7]E.g., Tinn-R (http://sourceforge.net/projects/tinn-r/) or WinEdt (http://www.winedt.com/).