WildlifeDensity QuickStart

v.2.5 Installation and Test-Drive

The procedure set out below summarizes the installation of *WildlifeDensity* version 2.5 on your own computer (see details in the README file) and introduces its structure and operation.

Operating Requirements

WildlifeDensity-2_5 is a transitional version designed to run on recent model Apple Mac computers using any macOS version from macOS 13 (Ventura) to 14 (Sonoma) or later.

Apart from *WildlifeDensity* itself, you need a text-editing app and at least one other program for routine use. For your own data collation and preparation, you need a good spreadsheet program: the widely used *MS Excel* is ideal; so is Apple's *Numbers*. A text-editing program, Apple's TextEdit, comes already installed in current Macs. The application *BBEdit,* which comes free for basic operations and is downloadable from either the App Store or Bare Bones Software, may also be useful.

1. Install the Program

The program is supplied within an installtion file called Install_*WildlifeDensity_2_5.zip.*

(a) If necessary, copy the installation file to the desktop and double-click to open it. It provides

- *Installation README v.2.5..txt* (text file)
- *WildlifeDensity QuickStart — v2.5 Installation and Test-Drive* (*pdf*)
- *WildlifeDensity.app.zip* *(app installation file)*
- *WildlifeDensity Resources* folder, with:

  Field Data Sheet templates (6 *.pdf files*)

  Sample Input Data (3 *.WDdata* files)

(b) Drag-and-drop the *WildlifeDensity.app* file into the Applications folder on the computer.

(c) Drag the *WildlifeDensity* file icon to the end sction of the dock on the desktop.

(d) Remove any older *WildlifeDensity* files from the Applications folder and either aechive or delete them.

(e) Drag the *README* and *QuickStart* files to the desktop.

(f) Drag-and-drop the *Resources* folder either into the Applications folder or into the >Library>Application Support folder. Close any old *WildlifeDensity* icons in the dock and drag them out to delete them.

(g) If desired, print the *QuickStart* file and have it beside you before going further.

You may also print the field data sheets to use later as templates for your own data sheets;

2. Run the Program

Now give the program a 'test run'.

(a) Open the *WildlifeDensity* Resources folder and find the *Sample Input Data/Line Transect Radial Example.WDdata* file, with data from a walked grassland survey of a kangaroo population based on radial detection distances. Either drag its icon to the *WildlifeDensity* icon in the dock or simply double-click it. A program window should open on the desktop, with the filename at the top, details of the data set below it, then five tabs in a row below that. Ignore the rest of the window and click on the 'Estimate' tab.

(b) Select the **Calculate** button. Data processing should begin. When processing ends, a graph window will appear that plots the detection distances from the observer as dots connected by dashes. The calculated *WildlifeDensity* modelled data show as a continuous yellow line; this approximates the distribution of the data. Below the graph is the overall best estimate of density made by *WildlifeDensity*, together with its standard error. Notice the distinctive shape of a distribution of radial distance line transect data in the graph: a 'bell-shaped' curve skewed to the left. There are few or no detections close to the observer then, as distances increase, the numbers detected rise to a peak then fall away progressively at greater distances, ultimately reaching zero.

(c) Notice also an overall results summary in the lower part of the Estimate window, together with the locations of two files (*Line Transect Radial Example 1.graphData* and *Line Transect Radial Example 1.results*). These carry the output from the computer run. Double-click the *.graphData* file and examine its contents; these are the values already plotted in the graph. Close the graph window (*top left button*).

(d) Now double-click the *Line Transect Radial Example.results* file and examine its contents. The main results are the estimated parameters of the kangaroo population: its estimated density and its standard error and the 95% confidence limits for the density estimate (below the table). Notice what else is there too: lists of both the main inputs to the program and its principal outputs. Close the *.results* file.

(e) Select each of the window tabs (Method, Sample Details, Observations, Options, Estimate) in turn to see where data are entered on the *WildlifeDensity* graphical user interface [abbreviated GUI].

(f) Then select Help on the *WildlifeDensity* menu bar at top right of the main computer window. Click on **WildlifeDensity Manual** to open and examine it. The Help Manual consists of a page-numbered contents table followed by an introduction, and concise details of how to enter your own data, run the program, and read and interpret results. It can be printed directly from there if you have a printer available; we recommend doing so.

3. Run Other Types of Distance Data

WildlifeDensity can produce density estimates from other types of distance data. Two examples are provided. The first also uses line transect sighting data: but this time perpendicular detection distances in the same horizontal plane as the observer. The second uses a related but less well-tested method: using sighting data collected by an observer rotating at a fixed point and watching for animals to come into view as a result of their own movements.

Perpendicular Distance Line Transect Data. Go again to the *WildlifeDensity* Resources folder and locate the *Line Transect Perp. Example* file. This contains field data from a line transect census of a songbird species living in a woodland vegetation canopy. Open it either by double- clicking or by dragging its file to the *WildlifeDensity* icon in the dock.

(a) Scan the contents of the tabbed windows in the GUI. The perpendicular distance data file has the same format as the radial example but with differences that allow the program to recognize and process the type of data submitted. The observational data in each row of this example are (1) the perpendicular distance of each group from the transect line, as calculated by the investigator, and (2) the number of birds seen in the group. (Pre-calculating distances from the transect line isn't necessary: *WildlifeDensity* will calculate its own perpendicular distances if you supply both the radial distances and horizontal detection angles. Pre-calculating distances is simply an option available to the user.)

(b) Select the **Calculate** button in the Estimate window as previously and wait for the graph to appear. Detection distances here are now distances from the transect line. Notice the characteristic frequency distribution of perpendicular distance line transect data: highest numbers in frequency classes on the left, nearest the transect line, falling away with increasing distance from the transect in a curve with a shape like a capital-S reversed left to right.

(c) Examine both the *.graphData* and *.results* files in the program output.. Compare both with the comparable files from the radial distance data. Note the similarities and differences. The standard error of the conspicuousness coefficient shows a zero, indicating 'no estimate'; conspicuousness was set automatically at a typical value during computation because the sample size was insufficient to compute one (<250). Close both files.

Fixed Point Sightng Data. Go again to the *WildlifeDensity* Resources folder and find the *Fixed Points Census Example* file. This contains field data from a fixed point census of the weebill, a songbird that forages in small flocks in the foliage of mallee eucalypt shrubland. Open its data file in *WildlifeDensity.*

(d) In the Sample Details tabbed window, make sure that 'Elevation angles supplied' is selected. Then examine the Observations window; there are three numbers in each data row instead of two. Each row consists of: (1) the horizontal radial distance to each group from the observer, (2) the number of birds seen in the group, and (3) the angle of elevation to each group at the moment of detection.

(e) Go to the Estimate window, select **Calculate** as before, then wait for the graph to appear. The characteristic frequency distribution pattern of fixed point data is similar to that of radial distance line transect data.

(f) Examine both output files and compare them with the comparable files from the line transect data. There are more differences this time, and the survey more demanding. Close both files.

When constructing your own data input files, follow the procedure in the Help Manual.