

WiSP Wildlife Simulation Package



What is WiSP?

Download an overview

Introductory tutorial

Contacting authors; citation

Revision history of WiSP

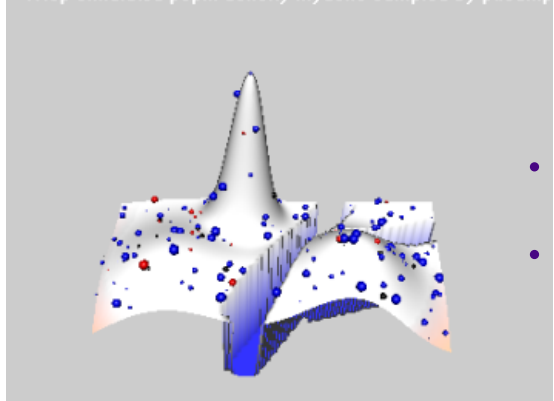
Download R

Download WiSP 1.2.6

WiSP is a library of functions to be used in conjunction with [R software](#)

Example results

Wisp simulated popn. density mydens sampled by pt.samp

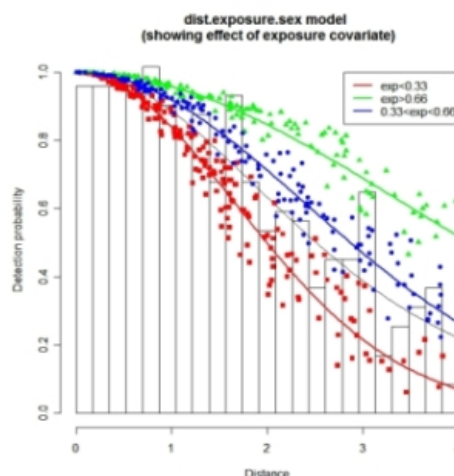


This software offers the ability for students and field researchers to investigate the behaviour of a variety of sampling schemes and estimators of density and abundance. There is also a flexible means of generating populations.

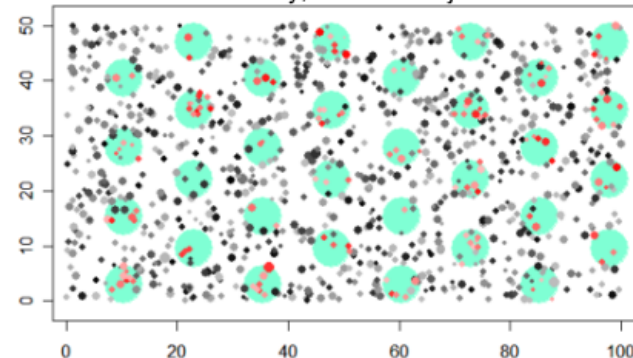
- populations can be comprised of individuals with identical detectability characteristics, or highly different characteristics,
- the spatial patterning of individuals in simulated populations can be uniform, or highly non-uniform (as shown at left).

Creating populations

with these varying characteristics allows researchers to deduce whether the characteristics of populations of interest to them might create challenges for sampling schemes and estimation techniques. This helps students learn about the capabilities of various types of sampling, and means of estimating animal abundance. In addition, it offers researchers the ability to scrutinize possible data collection and analysis methods before costly field investigations are conducted.



Point transect survey; detected objects in red



Recently, WiSP has had additional capacity added that allows the analysis of some classical datasets from the literature. We have added a set of translator functions, making WiSP population simulation available for analysis by other software packages. Investigators can examine the behaviour of an extended set of estimators of abundance available in [RMark](#) and the multiple covariate approach for fitting detection functions to distance sampling data.

Updates to the library

Revisions to Version 1.2.6

1. February 2012, rebuilt under R version 2.14.1 for consistency with recent versions of R.
2. July 2010, rebuild under R version 2.11.0.
3. Two new methods by which to generate density surfaces. These surfaces are used as the basis for generating populations that are unevenly distributed across a study area. If you wish to mimic the distribution of habitats within your study area, or if you have telemetry or aerial photos of animal distributions, routines can be brought into WiSP more easily using these functions.
 1. One function fits a generalized additive model (gam) to user-specified x-y animal location coordinates.
 2. The second function allows manipulation of the density surface using the mouse to elevate areas of high animal density, and depress areas of low animal density (see poster below).
4. A description of these functions can be seen in a [poster](#) coauthored by David Borchers, Walter Zucchini, and Daniel Adler at the International Statistical Ecology Conference in St. Andrews in July 2008.

Revisions to Version 1.2.5

1. Internal revisions, never publicly released

Revisions to Version 1.2.4

1. Translation facility to permit analysis of WiSP double platform samples with the MRDS library (Laake and Borchers 2004).
2. A significant number of errors were expunged. Now, fewer bothersome and extraneous messages will appear when using WiSP (don't worry, the meaningful errors [about which you should take action] will still be apparent to you).
3. Sliders are now employed to visually specify parameters for the distribution of exposure and distribution of group sizes in population specification.
4. A new function allows specification of multiple model objects. The function will produce a ranked list of AIC values, AIC weights, and weighted average estimates of abundance; i.e., model averaged estimates. See documentation for function 'point.est.compare.'

Revisions to Version 1.2.3

1. A rudimentary menu system is automatically loaded when the package is loaded. This menu system will assist novice users in learning how to use WiSP functions to perform the fundamental tasks such as generating a population, generating a sample, and producing estimates from samples. The user is asked to respond to questions via dialog boxes, and the resulting commands are not only executed, but also echoed to the R console so novices can see what function calls and arguments are used to conduct the tasks they request.

The menuing system is also structured such that tasks are performed in the appropriate sequence. Hence a sample cannot be taken until a population exists, and the design characteristics of the sampling design have been specified. An [automated tutorial showing the use of this menuing system](#) requiring Shockwave can be viewed. Tutorial revised June 2007 to better fit screen size.

This is intended to make learning of WiSP less daunting, but to unleash the full features of WiSP, users will wish to eventually use the R console.

Revisions to Version 1.2.2

1. Import function to bring catch statistics into WiSP for estimation using removal estimators,
2. 3-dimensional plotting using [RGL library](#) to visualize density surface, resulting populations, and detection histories,
3. Translation facility to permit analysis of WiSP capture-recapture samples with the [RMark](#) library, and
4. Translation facility to permit analysis of WiSP line transect samples with the MRDS library (Laake and Borchers 2004); permitting analysis of covariates in the detection function (Marques and Buckland 2004)

Revisions to Version 1.2.1

1. Point transect plotting functions repaired
2. Point transect summary, date stamping, and simulation capabilities added, and
3. Bug fix repaired in plotting of removal estimator.

Revisions to Version 1.2.0

1. Analytical CIR estimators for 2- and 3-occasion designs,
2. Simulation capacity of analytical CIR methods, and
3. Fixed typographical errors in the help files.

Revisions to Version 1.2.0Beta

1. Library updated to run under R version 2.0,
2. Simulation functions added to facilitate simulation testing,
3. Added summary and plot functions for most WiSP objects,
 - Point transect and nearest-neighbour methods not updated
4. Time and date stamping of WiSP objects for easier auditing,
5. Pledger's (2000) estimators for mark-recapture models with heterogeneity,
6. Double-platform estimators (Borchers et al. 1998) for line transect estimators, and
7. Real and simulated data sets added to the library.

References

- Borchers, D.L., W. Zucchini, and R.F.M. Fewster. 1998. Mark-recapture models for line transect surveys. *Biometrics* 54: 1207-1220.
- Laake, J.L., and D.L. Borchers. 2004. Methods for incomplete detection at distance zero. Pages 108-189 in *Advanced Distance sampling*. Oxford University Press.
- Marques, F.F.C., and S.T. Buckland. 2004. Covariate models for the detection function. Pages 31-47 in *Advanced Distance sampling*. Oxford University Press.
- Pledger, S. 2000. Unified maximum likelihood estimates for closed capture-recapture models using mixtures. *Biometrics* 56: 434-442.

Last Modified: Wednesday, 4 April 2012