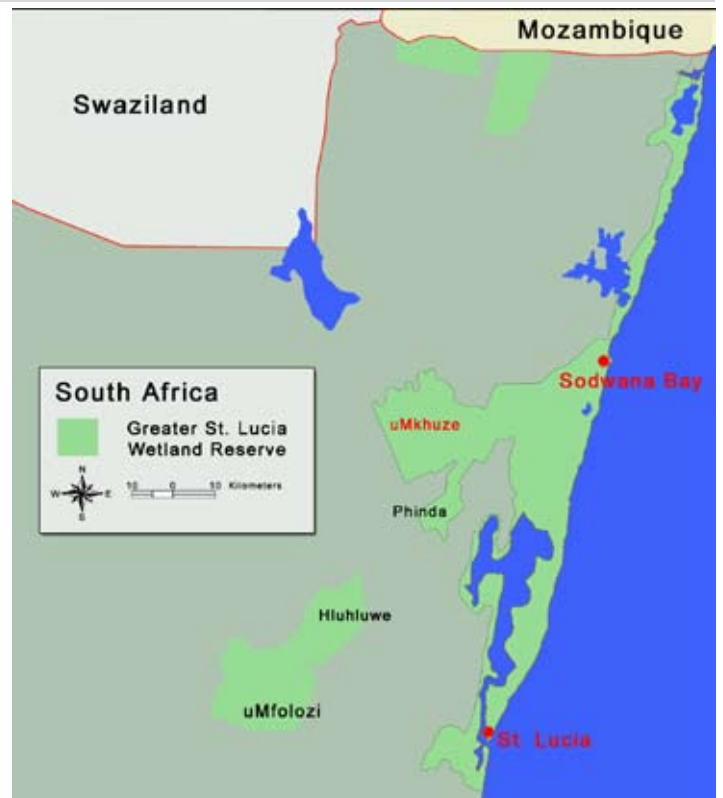


Mkhuze Atlas surveys 2007

Dr Tim Coles, Operation Wallacea

In 2006 Operation Wallacea teams tested a methodology for completing an atlas survey across the whole of the Greater St. Lucia Wetland Park. A grid of approximately 100 squares 5km X 5km has been laid over the whole of the Park and the objective is to complete equal effort surveys over the whole Park in each of these squares to provide distributional maps and additional data on habitat usage by the Rare Threatened and Endemic species within the Park. As previous atlas surveys have found, it is difficult to accurately proportion effort according to habitat type across such a large area as a 5km square and indeed in some squares access is severely limited. It was therefore proposed to select 8 X 1km squares to represent proportionally as far as possible the different habitats within the 5km square. This would give 26% coverage of each 5km square.

The 2006 surveys tested this methodology and made a number of changes to improve the safety and efficiency of the surveys (below).



1. Using the grid of 1km squares within each 5km square was impractical since safety considerations and the need to move between squares rapidly meant that each of the 1km squares needed to be close to a road or track. 8 X 1km squares were therefore selected as below to represent various habitats proportionally as far as possible. A road or track was used as one edge of a square and the other two corners fixed using a GPS.

2. Although intensive survey effort needed to be directed to the 26% of the area being surveyed, additional effort was better focused on providing records from other parts of the 5km square and in particular at targeting effort to maximise catches for particular groups (e.g. bats).

3. The herpetofauna and mammal teams were better combining their efforts, rather than forming independent teams. The methodologies to be used are as follows:

Birds

Four squares are visited each morning (to noon), with each survey lasting 1 hour. Designated survey timings are as follows: 06-30 to 07-30, 08-00 to 09-00, 09-30 to 10-30 and 11-00 to 12-00. Given that four days are needed to visit all 16, 1 x 1 km squares examined in 2006, the number of repeats that can be accommodat-

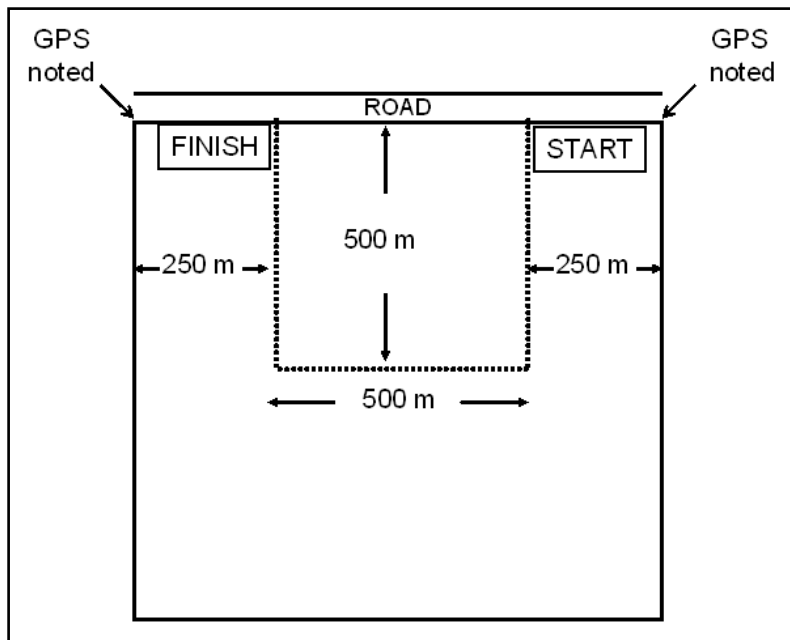


Figure 3. Diagram to show the standard survey routing through a 1 x 1 km square.

ed to allow for bad weather within the project period, is six. This also allows time for the identification of difficult species (e.g. *cisticola* spp.). Start times are to be 'cycled' sequentially so that individual squares are sampled at different times during the morning to remove bias due to the typical, progressive decline in bird activity through the morning period.

Each survey walk will start and end on a road (Fig. 3). The first leg of the 'standard' survey route will entail walking at right angles to the road for 500 m into the square, following which a 90o turn is made and a further 500 m walked; the return to the road is achieved following a second 90o turn. Start and finish points are not to be switched during the course of the survey walks; directionality in this regard is governed by the most favourable early morning lighting conditions. The rationale of using this routing pattern is a compromise between trying to maximize coverage (re: a route that takes observers within 250 m of most of the terrain, with the exception of that sector furthest from the road), whilst at the same time permitting a relatively slow walk pace thereby enhancing both the detection and identification of birds.

All birds seen (including in flight overhead) or heard are to be recorded. Birds that cannot be specifically identified, are to be scored either to family/genus level (e.g. *cisticola* spp., sunbird spp., tchagra spp.), or recorded as unidentified. The former designations are helpful in some instances with retrospective identifications, whilst both the former and latter have been used to evaluate numerically competency in development of

identification skills through the survey period.

There should be limited opportunities for mist netting in the mornings not used to complete the survey walks. The mist nets need to be positioned at any point within the 5km so as to maximise catches. Mist netting allows for additional cryptic species.

The afternoons and early evenings are to be used for surveying different parts of the 5km square to increase the species lists.

These surveys should translate into the following standardised effort for each 5km square over a 3 week period:

- 48 man hours bird recording in the target 1km squares
- 6 hours mist netting
- 30 hours observations in the afternoons/early evening

Herpetofauna and mammals

The herpetofauna and mammal teams are much less mobile than the bird teams since they have to position and check traps. Covering all 8 of the 1km squares with pitlines and traps proved impractical and effort with pitlines and traps needs to be focused on one of the 1km squares for 8 days with only two of the 1km squares being covered over the 3 week survey period for each 5km square. Three transect sites need to be selected within the 1km square. Each transect comprises 110m of driftnet fencing at a height of 50 cm running in as straight a line as possible with a lip buried along the length to ensure animals cannot pass underneath. Along this, ten 20 litre catch buckets are placed 10 m apart flush with the surface with the fencing bisecting the top. Six funnel traps are placed along each line and camouflaged with the available leaf litter to catch lizards and small snakes. These are comprised of stiff cylindrical body with inverted funnels approximately 60 cm in length. Six Willun traps (small-mammal pressure traps) are placed within 5m of the transect line, specifically targeting bush thickets where small mammal lines are clearly visible. The traps are baited with equal parts peanut butter and rolled oatmeal with a small amount of honey.

The remaining 30 small mammal traps should be positioned to maximise catches in other parts of the 5km square and checked/re-baited daily.

In each of the 8 X 1km squares though a 2 hour opportunistic search for herpetofauna and signs of mammals should be completed. Investigators should search under stones, amongst dead wood, and on tree trunks for herpetofauna species and should note all scat and spoor signs of mammals. 2 hour night drives with spotlights should be completed on 5 occasions throughout the 5km square to provide additional sighting records of the larger mammals and reptiles.

Mist netting for bats should be targeted at sites likely to maximise catches (identified roost sites, flight paths etc.) with 27m of nets used for a 2 hour period on 10 occasions over the 3 week survey period.

These surveys should translate into the following standardised effort for each 5km square over a 3 week period:

- 420 bucket nights for herpetofauna and small mammals
- 252 funnel trap nights for herpetofauna
- 252 small mammal trap nights in the 1km squares
- 400 trap nights opportunistic small mammal trap surveys
- 16 team hours searching for herpetofauna and signs of mammals
- 10 hours night drive records for large mammals and reptiles
- 20 hours mist netting for bats

Staffing for the atlas surveys

Xander Combrink (KZN Ezemvelo Wildlife) is the Senior Scientist on the atlas survey reporting to Dr. Scotty Kyle (KZN Ezemvelo Wildlife). Dr. Robin Brace (Nottingham University) is leading the bird surveys with assistance from Chris Sinclair (Operation Wallacea). Dr. Peter Taylor (Durban Natural Science Museum) is leading the mammal surveys with assistance from Anita Rautenbach (Durban Natural Science Museum). Jon Warner (University of Witwatersrand) is leading the herpetological surveys. Dylan Panos, Johnny Minaard and Trevor Lungfelt

who are all level 3 qualified guides under the Field Guide Association of South Africa (FGASA) scheme and all have at least 6 years experience of leading walking tours in large game areas are providing the safety cover for the surveys and experienced interpretation of spoor and scat signs.

Additional Surveys

Dr. Ansie Dipenaar-Schoeman (Plant Protection Research Institute) and Charles Haddad (University of the Free State) will also be collecting spiders and scorpions.

Logistics support

The expeditions are organised by Johan Scholtz (WEI) and the senior Operation Wallacea representative on site is Danielle Hines (Operation Wallacea). The bush training and advanced bush training courses are run by Darrell Viviers. The dive training courses are run by Coral Divers at Sodwana Bay and the reef ecology course is run by Robert Arthur (Swansea University) and is based on a course developed by Dr. Dave Smith (Essex University). Medical cover is being provided by Dr. Olwen Williams (UK based GP), the Senior Medical Officer on site assisted by Jonathan Isaia (London Ambulance Service). Medical electives John O'Neill (Trinity College Dublin) and Angharad Spencer (Sheffield University) are providing additional medical support.

