



## SnapshotSafari Camera Trap Network

*Guidelines for collecting, storing, and transporting camera trap data in collaboration with the University of Minnesota Lion Center*

### OVERVIEW

In order to standardize methodology across many reserves to facilitate data processing and sharing, we ask that the following guidelines be adhered to when placing cameras and collecting images and associated data.

### CAMERA TRAPS

Guidelines for placing camera traps, adjusting settings, and maintenance can be found in Protocol II – SnapshotSafari Camera Trap Deployment.

When cameras are deployed and each time batteries/SD cards are changed, data should be collected on habitat, camera status, and image quality (see **DATA COLLECTION** below). This information will be entered into an Access database developed by the University of Minnesota Lion Center (UMNLC).

### DATA COLLECTION

**Metadata.** Upon initially placing or when relocating a camera trap, collect site metadata as outlined in Protocol III - SnapshotSafari Camera Trap Metadata, using the SnapshotSafari\_Field\_Metadata spreadsheet. When submitting the first batch of camera trap images to UMNLC, include an electronic copy of this spreadsheet and send updates as they occur.

**Field Data.** When collecting SD cards in the field and when uploading images, record data on camera and image data condition in hard copies of the SnapshotSafari\_Field\_CameraCheck Excel spreadsheet. Enter this data into the SnapshotSafari Camera Trap Microsoft Access database as outlined in Protocol IV - SnapshotSafari Camera Trap Database.

**Images.** Store image files from the camera traps according to the directory structure described in Protocol V - SnapshotSafari Camera Trap Directory.

### DATA MANAGEMENT

**Data Transport.** At the end of each season (~six months), export the Snapshot database by following the directions in Protocol IV - SnapshotSafari Camera Trap Database. Send consolidated images and metadata to Sarah Huebner at the University of Minnesota for cleaning and processing, either on a hard drive or uploaded online (Google Drive, Dropbox, etc.).

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**Data Storage.** Camera trap images will be uploaded to the University of Minnesota Supercomputing Institute for processing, storage and transfer to Zooniverse, where they will be classified by online volunteers (“citizen scientists”). Please retain a back-up copy of the images on-site.

**Data Processing.**

**Cleaning:** Sensitive images (i.e., rhino or other threatened species) can be removed before uploading to the internet. However, uploaded images are not linked to specific sites within the protected area, rendering online imagery geographically anonymous. The field metadata are used to process images for upload (e.g. assign unique image identifiers, correct malfunctioning timestamps, remove blank images, etc.) at UMNLC before transfer to Zooniverse for online release.

**Citizen Science Processing:** UMNLC has partnered with Zooniverse to develop an online platform for processing the camera trap images. Volunteers (citizen scientists) will access your images through your unique website within SnapshotSafari. Online volunteers typically require ~2-3 months to process 1TB worth of image data. Thirty volunteers view each photo and record the number of species and individuals present, presence of juveniles, and the occurrence of five basic behaviors. The SnapshotSafari interface walks even the most inexperienced volunteers through the species identification process (Figure 3).



**Figure 3.** The SnapshotSafari online user interface enables volunteers to select and enter key information on different species present in each image.

**DATA PRODUCT**

After the images have been viewed, the resulting data are consolidated into the database with one record per species per image (Figure 4).

CaptureEventID	DateTime	SiteID	LocationX	LocationY	NumSpec	Species	Count	Standing	Resting	Eating	Interactin	Babies	unique_id
ASG0002kji	7/18/2010 16:26	B04	695238	9729497	1	human	2	0.095238	0.619048	0.047619	0.333333	0	S1_B04_R1
ASG0002kk2	8/10/2010 18:35	B04	695238	9729497	1	human	1	0.4	0	0	0.05	0	S1_B04_R1
ASG0002kka	8/24/2010 9:27	B04	695238	9729497	1	human	1	0	0	0	0	0	S1_B04_R1
ASG0002kjm	7/24/2010 8:20	B04	695238	9729497	1	gazelleGrants	1	0	0	0	0	0	S1_B04_R1
ASG0002kjt	8/1/2010 17:35	B04	695238	9729497	1	gazelleGrants	3	0.571429	0	0.071429	0	0	S1_B04_R1
ASG0002kjin	7/24/2010 10:14	B04	695238	9729497	1	reedbuck	1	0.833333	0	0	0	0	S1_B04_R1
ASG0002kin	7/30/2010 3:59	R04	695238	9729497	1	dikDik	1	0.809524	0	0	0	0	S1_R04_R1

**Figure 4.** Data generated from the camera trap images will ultimately be consolidated into this format.

***Citizen Science Outreach.*** We actively engage with the public via our Zooniverse website and various social media outlets. This includes answering questions on the SnapshotSafari discussion boards, maintaining an active blog, and posting on Facebook and Instagram feeds. We are happy to share news of programs and events at your individual sites, and we love to see information about your team and conservation work. Please let UMNLC lab coordinator Jamee Snyder ([snyde566@umn.edu](mailto:snyde566@umn.edu)) know two weeks in advance if you would like to have something specially promoted. If a member of your team is interested in being a moderator for your board, please let us know!

***Scientific & Management Use of Data.*** The finalized database will allow participants to generate estimates of species abundances, track changes in population numbers through time, and improve security of the reserve. In addition, these data will be made available for scientific and educational purposes throughout the world. UMNLC has partnered with the website HHMI BioInteractive (<http://www.hhmi.org/biointeractive>) to use SnapshotSafari images to teach children about ecology, evolution, and wildlife behavior. The user interface will feature a map of southern Africa with each participating reserve highlighted and details accessible by clicking on the reserve name.