

## Proposed TEAM Terrestrial Vertebrate Data Quality Standards

There are no widely-accepted quality control measures for camera trap data. The Camera Trap Federation established a minimum data standard in order to exchange datasets among institutions using camera traps for wildlife monitoring. The quality control measures described here go beyond what is needed for data exchange.

Quality Control Measure	Standard
Temporal consistency	All data within a sampling year at a given site should be within a period of 5 months.
Number of sampling days at each point	Each camera trap point should be sampled for at least 30 consecutive days in a given year.
Number of sampling points at each site	At least 60 sampling points should be deployed at each site each year. If more than 10 of these points are not operational (because of camera failure, theft, etc) data should be flagged.
Camera trap failure rate	Minimum acceptable annual failure rate of cameras is between 3-5%. Sites with larger values should be flagged.
Geographic species range check	Species identified at a TEAM site should fall within known IUCN geographic ranges. If not, records for those species should be flagged and reviewed by experts.
Standardized taxonomic names	Taxonomic names follow the IUCN Mammal Red list and Birdlife International checklist.
Species id	Regional experts should review species identifications for each site. If original identifications by site personnel have $\geq 5\%$ error for a given species (based on an initial assessment for each site), all images of that species will need to be reviewed by experts.
Changes in the number of individuals within a sequence	If the number of individuals in a sequence (consecutive images separated by no more than 1 minute) changes by a factor of 4 or more (increase or decrease) all images in that sequence should be flagged and reviewed.
Cross check dates and times	For start and end images (images taken during camera trap setup and pickup) the date of the photo imprinted on the image timestamp coincides with the information written on the white board (held by technician in setup or pickup photos).
Temperature unit consistency	All temperatures reported in the images are in Celsius (not Fahrenheit).
Moon phase consistency	Moon phases notations vary between camera trap firmware versions and models. Standard proposed: 1: New, 2: New Crescent, 3: First Quarter, 4: Waxing Gibbous, 5: Full, 6: Waning Gibbous, 7: Last Quarter, 8: Old Crescent
Image EXIF Metadata	Ensure EXIF metadata is compliant with standard subset of EXIF data in the database. If fields are missing flag records and follow up with site managers.

<b>Quality Control Measure</b>	<b>Standard</b>
Image identification rating control	Each person identifying species, rates the image according to how certain s/he is of the identification: Absolutely sure, Sure, Not Sure. For images identified as 'Absolutely sure' identifications should be 99% correct or higher.