Camera traps for monitoring biodiversity

By Don Swann

CAMERA TRAPS (ALSO CALLED WILDLIFE CAMERAS), USED in many parks to document species occurrence and estimate population size, are emerging as an exciting new technology for monitoring biodiversity, particularly for mammals and terrestrial birds. Two efforts stand out that are particularly relevant for monitoring mammal communities in U.S. and Canadian national parks: the Wildlife Picture Index (WPI; O'Brien et al. 2010) and the Terrestrial Ecology Assessment and Monitoring (TEAM) network (Ahumada et al. 2011, 2013). Both approaches use arrays of multiple camera traps set in a randomized design to sample mammals on a landscape scale. Results from the TEAM network show that the surveys effectively track trends in species diversity, including species richness, evenness, and dominance. The Wildlife Picture Index has been described as "a promising new indicator derived from camera trap data that measures changes in biodiversity from the occupancy estimates of individual species" (Ahumada et al. 2013), and is being used to monitor mammal communities in Mongolia, Costa Rica, and other areas.

CONTINUED ON PAGE 111

"CAMERA TRAPS" CONTINUED FROM PAGE 105

In addition to community monitoring, the technology associated with camera traps and data analysis techniques continues to develop rapidly; a second international conference on this topic was held in Sydney, Australia, in September 2012. Developing approaches include use of camera traps to monitor rodents, other small mammals, and herpetofauna, and to estimate abundance of unmarked animals (the Random Encounter Model; Rowcliffe et al. 2008).

Ahumada, J. A., J. Hurtado, and D. Lizcano. 2013. Monitoring the status and trends of tropical forest terrestrial vertebrate communities from camera trap data: A tool for conservation. PLoS ONE 8(9):e73707. doi:10.1371/journal.pone.0073707.

Ahumada, J. A., C. E. F. Silva, K. Gajapersad, C. Hallam, J. Hurtado, E. Martin, A. McWilliam, B. Mugerwa, T. O'Brien, F. Rovero, D. Sheil, W. R. Spironello, N. Winarni, and S. J. Andelman. 2011. Community structure and diversity of tropical forest mammals: Data from a global camera trap network. Philosophical Transactions of the Royal Society B: Biological Sciences 366(1578):2703–2711. doi:10.1098/rstb.2011.0115.

O'Brien, T. G., J. E. Baille, and M. Cuke. 2010. The Wildlife Picture Index: Monitoring top trophic levels. Animal Conservation 13(4):335–343. doi:10.1111/j.1469-1795.2010.00357.x.

Rowcliffe, J. M., J. Field, S. T. Turvey, and C. Carbone. 2008. Estimating animal density using camera traps without the need for individual recognition. Journal of Applied Ecology 45(4):1228–1236. doi: 10.1111/j.1365-2664.2008.01473.x.

About the author

Don Swann *is a biologist with Saguaro National Park in Tucson, Arizona. He can be reached at don_swann@nps.gov.*