

The Use of Citizen Science Smartphone Technology in Herpetofauna Monitoring

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Abstract

New and advancing technologies, especially those using smartphone software applications, can be used as organism occurrence recording tools and/or crowdsourced species identification systems (e.g. iNaturalist). The effort and accuracy of citizen science volunteers using this technology were evaluated in this study to provide feedback to researchers and resource managers so they can more effectively incorporate the efforts of volunteers and their smartphone technology in amphibian and reptile (herpetofauna) monitoring. We found that the reliability and accuracy of data collected by volunteers participating in a herpetofauna coverboard study using this technology was affected by climate conditions and herpetofauna group (anuran, salamander, lizard, snake) and more specifically by species. This study highlights that certain measures need to be put into place to maximize data collection accuracy associated with volunteers' ability to photograph lizards as they escape under drier conditions and volunteers' ability to visibly see smaller, camouflaged salamanders. Further, species identifications made through iNaturalist were determined to be 100% accurate. A variety of factors (herpetofauna group, species, photograph quality) play a role in crowdsourced species identification effort and therefore would influence time commitment required by the resource manager to verify volunteers' photographic evidence. Finally, the impacts of smartphone technology used in the field by volunteers were analyzed and it was determined that associated technology problems could be eliminated by implementing screening and protocols emphasizing smartphones which have appropriate battery and data storage capacity.