Reviewing Observations for the Idaho Amphibian and Reptile iNaturalist Project For Improved Data Quality

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Abstract

Data on the occurrence and distribution of amphibians and reptiles are needed to identify and address conservation problems for these species. Observations from crowd-sourced/citizen science projects are an important source of data for conservation and management. Crowdsourced data such as iNaturalist observations have several strengths, including large amounts of recent data over a broad area, low cost, accurate spatial coordinates, photo vouchers or sound recordings that allow identification confirmation, and public education and engagement. The goal of this project is to increase and improve available data for amphibians and reptiles in Idaho, USA. The Idaho Amphibian and Reptile iNaturalist Project was initiated in June of 2016 by the Idaho State University (ISU) Herpetology Laboratory using iNaturalist, an application from the California Academy of Sciences, which allows people to contribute observations of organisms using their mobile devices. The current number of observations in the project (as of 8 July 2022) is 5,546 from 40 species by 1,296 observers. Observations are added to the project either directly by observers or by project curators using the Find Suitable Observations function on the iNaturalist project website. Project curators (from the ISU Herpetology Laboratory, Idaho Museum of Natural History, and Idaho Department of Fish and Game) review suitable observations, (i.e., observations with digital photographs or audio recordings, geographic coordinates, dates and times) and confirm or correct species identifications. Because of the relatively low number of amphibian and reptile species occurring in Idaho and the relative ease of taking adequate photographs, we have been able to confirm or correct the identifications of over 93% of the contributed observations. The rate of misidentifications for "Research Grade" observations (i.e., observations with a date, coordinates, and a picture or sound recording, and with at least 2 out of 3 additional users agreeing on the identity of a specimen) is less than 2%. We mark confirmed or corrected observations as curator reviewed and then the Idaho Department of Fish and Game adds them to the State Species Diversity Database, which is part of NatureServe. These data are primarily used to help determine species status and trends for the State Wildlife Action Plan (SWAP) which is used to establish priorities for management actions. Analyzing unstructured,

crowdsourced data presents several challenges, including the lack of a sampling design, uneven coverage across space and time, and absence of negative data, which makes it hard to quantify observation effort. Our analytical approach includes temporal and spatial aggregation of the observations to reduce sampling bias, using records of similar species to indicate observation effort, and mapping occupancy to reveal spatial patterns.

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Conflicts of interest