ACSA Publications Listing
No. 13– December 2020
List moderator: Amy Slocombe

Journal Articles - *Conference Proceedings Articles* *Dissertations* - *Books & Chapters*

From the moderator

Thank you to everyone who contributed to this issue of the ACSA Publications Listing.

The ACSA Publication Listing is a quarterly electronic listing of publications in the field of citizen science within the Australian community. The listing is intended to share information with those interested in the Australian citizen science community.

If you are interested in obtaining a copy of one of the papers below, you can email the lead author who may send you a copy at their discretion.

Amy Slocombe

Abstracts of recently published journal articles

Koala Counter: Recording Citizen Scientists' Search Paths to Improve Data Quality

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Biodiversity monitoring is key for developing informed solutions to the threats facing our environment, including habitat loss, increasing pollution, wildlife trafficking and climate change. Citizen science is increasingly used for collecting species observational data at wide spatial and temporal scales that are difficult and expensive to achieve using traditional means. Current apps used for citizen science biodiversity monitoring provide methods to record observational data on species' presence, including photos, location, date, time and an assortment of other data. However, data about species absences as well as automatically generated and accurate data on both search effort and search locations have been lacking. Koala Counter is a free, cross-platform (Android & iOS), open-source app that was developed for a citizen science project to collect koala population data to inform koala conservation and management in South Australia. The app uses mobile phone sensors to transparently and automatically record metadata such as species observation location and time, the search path the user takes, the time taken while searching and GPS location

precision. We tested this in the Citizen Science event "The Great Koala Count 2" in South Australia during November 2016. Observations, paths and search effort data were accurate overall. Location accuracy was good, with some exceptions. Use of the app indicated a number of potential improvements that would further increase data quality. Recording search paths offers a potentially valuable method of recording spatial and temporal components of search effort, improving on simple records of species observations and time taken, especially when no observations are made. These data may enable better ecological modelling by supplying accurate search effort data as well as enabling improved inference of species absence. Search paths also show locations that have not been searched, which is valuable information in management of citizen science monitoring programs.

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Grass Gazers: Using citizen science as a tool to facilitate practical and online science learning for secondary school students during the COVID-19 lockdown

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The coronavirus disease of 2019 (COVID-19) pandemic has impacted educational systems worldwide during 2020, including primary and secondary schooling. To enable students of a local secondary school in Brisbane, Queensland, to continue with their practical agricultural science learning and facilitate online learning, a "Grass Gazers" citizen science scoping project was designed and rapidly implemented as a collaboration between the school and a multidisciplinary university research group focused on pollen allergy. Here, we reflect on the process of developing and implementing this project from the perspective of the school and the university. A learning package including modules on pollen identification, tracking grass species, measuring field greenness, using a citizen science data entry platform, forensic palynology, as well as video guides, risk assessment and feedback forms were generated. Junior agriculture science students participated in the learning via online lessons and independent data collection in their own local neighborhood and/or school grounds situated within urban environments. The university research group and school coordinator, operating in their own distributed work environments, had to develop, source, adopt, and/or adapt material rapidly to meet the unique requirements of the project. The experience allowed two-way knowledge exchange between the secondary and tertiary education sectors. Participating students were introduced to real-world research and were able to engage in outdoor learning during a time when online, indoor, desk-based learning dominated their studies. The unique context of restrictions imposed by the social isolation policies, as well as government Public Health and Department of Education directives, allowed the team to respond by adapting teaching and research activity to develop and trial learning modules and citizen science tools. The project provided a focus to motivate and connect teachers, academic staff, and school students during a difficult circumstance. Extension of this citizen project for the purposes of research and secondary school learning has the potential to offer ongoing benefits for grassland ecology data acquisition and student exposure to real-world science.

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Presence and movement of humpback whale (*Megaptera novaeangliae*) mother-calf pairs in the Gold Coast, Australia

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The Gold Coast bay in eastern Australia has been hypothesised to be an important habitat, primarily for humpback whale (Megaptera novaeangliae) mother-calf pairs. Here we investigated relative distribution, and temporal patterns from 2,305 humpback whales between 2011 to 2017. The data were collected from whale-watching vessels using citizen science. We analysed seasonal presence of mother-calf pairs, dive times, direction of movement and location to determine habitat use of the bay as aresting area. In average aquarter of all sighted whales were mother-calf pairs with peaks of sightings each October. The recorded average dive time of 3.20 minutes was short compared to that in migratory corridors. Mother-calf pairs were sighted more often closer to shore relative to other pods. We compared our results to recognised breeding and resting grounds and found similar results, indicating that the Gold Coast bay may serve as an important stop-over for humpback whale mother-calf pairs.

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A Hybrid Method for Citizen Science Monitoring of Recreational Trampling in Urban Remnants: A Case Study from Perth, Western Australia

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Vegetation trampling that arises from off-trail excursions by people walking for recreation can negatively impact the structure of understory plants in natural spaces that are an essential element of urban green infrastructure in a modern city. In addition to reducing the esthetic quality and environmental values of urban remnant and replanted native vegetation, such trampling reduces the habitat that supports wildlife populations within the urban fabric. This case study draws upon several disparate methods for measuring vegetation structure and trampling impacts to produce a hybrid method that community-based citizen scientists (and

land managers and other researchers) could use to simply, rapidly, and reproducibly monitor how trampling associated with urban recreation trails impacts the structure of understory vegetation. Applying the novel hybrid method provided evidence that trampling had reduced the vegetation structure adjacent to a recreational walking trail in an urban woodland remnant in Perth, Western Australia. The hybrid method also detected ecological variability at the local ecosystem-scale at a second similar woodland remnant in Perth. The hybrid sampling method utilized in this case study provides an effective, efficient, and reproducible data collection method that can be applied to recreation ecology research into aspects of trampling associated with trail infrastructure.

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