



WORKING PROJECT TITLE	Teaming up for success: the role of social behaviour in the spread of invasive Guttural Toads
CORE TEAM MEMBER	John Measey
ACADEMIC LEVEL OF THE PROJECT	MSc
PROJECT BACKGROUND	Social behavior can provide species with host of ecologically and evolutionary advantages (Gardner et al 2016), which may serve to increase a given species' invasive potential (Gruber et al. 2017; Damas-Moreira et al 2018). These advantages acts to benefit factors such as, transport and propagule pressure, but also physiological features, resource use, and survival. Toads have proven themselves to be exceptionally good at hitch-hiking. They turn up in suitcases, in consignments of plants, and in shipping containers that get moved all over the planet (Tingley et al 2017). One toad is unlikely to cause a problem at the point of disembarkation. But if toads prefer to travel together, this may explain why there are growing numbers of established and invasive toads around the world. Furthermore, if toads demonstrate a proclivity for social aggregations this may confer benefits with respect to maintaining water-balance and thermal conditions, through shared-shelter use, and accessing novel resources, through social learning and trailing behaviour. This may increase their success at not only finding themselves in situations where they are likely to be transported elsewhere, but also Increase they ability to survive the trip and persist in challenging novel ecosystems wherever they land (e.g., xeric habitats). This research aims to compare the social behaviour, and associated the biological implications, between native and invasive populations of the guttural toad, <i>Sclerophrys gutturalis</i> (Telford et al 2019). Our goal is to gain a



	deeper understand of how sociality may have promoted their invasive success. This project will require a student who has a keen eye for observation and a curiosity for an emerging field of research on an understudied taxa. This project also has the potential for both field studies and laboratory experiments, and will require someone to watch hundreds of hours of video footage to obtain data.
FURTHER READING	Gardner, M. G., Pearson, S. K., Johnston, G. R., & Schwarz, M. P. (2016). Group living in squamate reptiles: a review of evidence for stable aggregations. <i>Biological Reviews</i>, 91(4), 925-936. Gruber, J., Whiting, M. J., Brown, G., & Shine, R. (2017). The loneliness of the long-distance toad: invasion history and social attraction in cane toads (<i>Rhinella marina</i>). <i>Biology letters</i>, 13(11), 20170445. Damas-Moreira, I., Oliveira, D., Santos, J. L., Riley, J. L., Harris, D. J., & Whiting, M. J. (2018). Learning from others: an invasive lizard uses social information from both conspecifics and heterospecifics. <i>Biology letters</i>, 14(10), 20180532. Tingley, R., García-Díaz, P., Arantes, C.R.R. & Cassey, P., 2018. Integrating transport pressure data and species distribution models to estimate invasion risk for alien stowaways. <i>Ecography</i>, 41(4): 635-646. Telford, N., Channing, A. & Measey, J. (2019) Origin of invasive populations of the Guttural toad <i>Sclerophrys gutturalis</i> <i>Herpetological Conservation & Biology</i>. 14(2):380-392.
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