Received: 24 December 2025 | Accepted: 17 February 2026

DOI: 10.1111/csp2.70250

Conservation Science and Practice
A journal of the Society for Conservation Biology
Open Access
WILEY

EDITORIAL

Islands: Microcosms of socioecological change and barometers of global biodiversity trends

The recent declaration of the Christmas Island shrew (*Crocidura trichura*) as extinct offers a stark reminder of the vulnerability of island species (Woinarski & Burbidge, 2025). This enigmatic mammal, restricted to Christmas Island, Australia, seems to have declined sharply after the arrival of invasive black rats carrying novel pathogens and due to predation by invasive predators such as cats and snakes and habitat disturbance from yellow crazy ants (Woinarski et al., 2023). This quiet, incremental, and ultimately irreversible disappearance characterizes the global trend of islands as extinction epicenters, an outcome driven by vulnerability to well-established threats like invasive species and exacerbated by new pressures like climate change (Russell & Kueffer, 2019).

The fate of the Christmas Island shrew is far from a singular loss. It is a symptomatic example of a long-standing broader global pattern of erosion of island biodiversity in the aftermath of human arrival. Islands occupy ca. 5% of Earth's land surface but hold roughly 20% of global biodiversity (Tershy et al., 2015). The magnitude of anthropogenically driven island species loss is still far from understood (see e.g., Rando et al., 2024 for a recent example of unknown extinctions in the North Atlantic Macaronesian archipelagos). Yet, from what is documented, approximately three-quarters of human-driven extinctions over the past 500 years have occurred on islands (Fernández-Palacios et al., 2021; Matthew et al., 2022). The ecological richness of islands is matched by their cultural distinctiveness, with many island societies having developed deep local ecological knowledge systems that are tightly intertwined with their environments (Hong, 2013; Kueffer & Kinney, 2017). With islands at the epicenter of global socioecological change—facing increasing challenges associated with invasive species introductions, habitat loss and degradation, pollution, climate change and human socio-political dynamics—the socioecological systems, that converge on islands with exceptional intensity, are shifting at alarming rates.

Islands have been in the forefront of conservation science and practice, with some of the most high-profile conservation success stories being linked to insular species and ecosystems (Bolam et al., 2021; Jones et al., 2016), with these actions driven by consistently recorded threats to island species, particularly invasive mammals. Yet, substantial knowledge gaps persist. Basic data on lesser well known native species distributions, trends, ecological roles, and genetic diversity remain scarce (Aslan et al., 2015; Nori et al., 2022; Rato et al., 2024), while interacting threats—especially associated with invasive species—are poorly understood (Russell & Kaiser-Bunbury, 2019). Despite technological advances that facilitate biodiversity assessments at broader spatial scales and over longer periods, long-term monitoring remains limited (Brooke et al., 2018), and few studies have successfully integrated ecological and sociocultural data (but see e.g., Carvalho et al., 2015). Island freshwater ecosystems, which experience "double insularity" as islands within islands, remain poorly understood despite often supporting highly threatened species (Órfão et al., 2024). Furthermore, although island local ecological knowledge systems are being lost to ever-increasing globalization, spatially explicit information on this loss is lacking. Combined with governance constraints and research inequities, these gaps impede effective, evidence-based conservation on islands (Burt et al., 2022).

In this special issue on advances, challenges, and opportunities in island conservation, we present developments that address several of these gaps, highlighting new tools, interdisciplinary approaches, and community partnerships that together are reshaping island conservation science and practice. The contributions span terrestrial and marine systems, include ecological, technological, and social dimensions, and advance our understanding of islands both as vulnerable systems and as powerful models for global change research.

1 | IMBALANCES BETWEEN MAINLAND AND ISLAND RESEARCH HINDER CONSERVATION

Although island taxa are far more prone to extinction than their mainland counterparts, they remain

disproportionately overlooked in scientific research (Conenna et al., 2017; de Lima et al., 2011). Nunes et al. (2026) add to this evidence by showing that, although over one-fifth of the world's circa 12,000 reptiles are island endemics and 30% of these island-restricted species are threatened with extinction (compared to 12.1% of reptiles globally), they receive only 6.7% of all reptile-focused research.

2 | INVASIVE SPECIES AS A DOMINANT FORCE DRIVING BIODIVERSITY LOSS ON ISLANDS

Introduced species, long recognized as major drivers of biodiversity declines, continue to reshape island ecosystems (Russell et al., 2017). In this collection, Guedes et al. (2026) show that introduced mona monkeys caused over 40% predation on artificial nests within 1 week, threatening the reproductive success of birds in Príncipe Island (Central Africa), many of which are endemic. Still focusing on mammalian predators but acknowledging that predator impacts are often temporally dynamic and involve multiple, interacting species (Russell & Kaiser-Bunbury, 2019), Fox et al. (2026) expanded density-impact functions from single to multiple species to illustrate how rats and mustelids exert distinct pressures to New Zealand petrels, revealing key management windows for predator control.

Although invasive mammalian predators are key players in island extinctions and population declines (Doherty et al., 2016), harmful impacts extend well beyond this group. Philip et al. (2026) show that even relatively low densities of yellow crazy ants—a widespread invader of islands across the Pacific and Indian oceans—impact the presence and abundance of brown noddies and restructure hermit crab assemblages. Moving to the Galápagos, Hartwig and Pinto (2026) call attention to cryptic invasions with potential severe consequences by revealing the unexpected discovery of an invasive nematode infecting two endemic Galápagos rodents. They highlight the need for captive breeding as a precautionary safeguard.

By assessing a broader suite of land-based threats to largely island-restricted seabird populations across the Atlantic, Kalaitzakis et al. (2026) showed that invasive alien species—particularly rodents and cats—are responsible for the greatest population losses of pelagic seabirds in the region. Furthermore, they identified that the impact of invasive mammals is particularly acute in the island systems of Bermuda and the Canary Current and that invasive species management in Tristan da Cunha and Gough is the single intervention with the greatest potential for population recovery.

3 | TECHNOLOGICAL INNOVATION EXPANDS THE ISLAND CONSERVATION TOOLKIT

New technologies are increasing efficiency and effectiveness in conservation (Berger-Tal & Lahoz-Monfort, 2018). On islands these advancements include automated biodiversity monitoring, such as passive acoustic recorders and camera-trap networks (Ferreira et al., 2022; Soto et al., 2023), drone surveys (Nyberg et al., 2024), and GPS telemetry (Colosimo et al., 2022).

Considering the disproportionate impact of invasive species on islands, there is increasing pressure for the identification of cost-effective tools for invasive species surveillance and management. Steibl et al. (2026) address this by showing that environmental DNA (eDNA) can be used in the early detection of rodents. They illustrate how eDNA from beach and lake sites on three atoll islands can inform about the presence of invasive rats and can even distinguish between closely related species. Other than aiding in the detection of invasive species, technological advances are also contributing to control and eradication interventions. In an insightful perspective, Smith et al. (2026) explore how drones are transforming eradication methods, offering a precise, flexible alternative to helicopter-assisted rodenticide application. These authors show that drones are particularly useful for smaller or logistically challenging islands and may dramatically expand eradication feasibility as payload and endurance capabilities continue to improve.

Understanding the ecology and behaviors of native species remains essential for conservation, and much-needed knowledge can be obtained through capitalizing on smaller lightweight, cheaper and more accessible technologies. Reflecting this, Mandl et al. (2026) show that lightweight GPS devices can be used to track Livingstone's fruit bats *Pteropus livingstonii* and identify key roosting and feeding habitats in the Comoros, while Palmeirim et al. (2026) show that low-cost acoustic detectors can inform how insectivorous bats vary in their tolerance of habitat disturbance.

4 | MARINE ECOSYSTEMS AND HUMAN DIMENSIONS OF ISLAND CONSERVATION

Island-dwelling people are stewards of important marine ecosystems and these—even in remote protected areas—face increasing pressures. This is exemplified by Savage et al. (2026) when exposing that reef manta rays (*Mobula alfredi*) in the Chagos Archipelago ingest microplastics in surface feeding zones, with microfibers linked to

wastewater from inhabited atolls. Addressing such threats, including unsustainable fishing, requires socioecological approaches that engage local communities. Demonstrating this, Porriños et al. (2026) show that participatory, smartphone-based monitoring in the Atlantic archipelago of São Tomé and Príncipe can provide extensive data on fishing effort and catch composition, while Collins et al. (2026) show that in the central Indian Ocean island of Diego Garcia, participatory mapping and scenario workshops can inform about governance and compliance challenges, emphasizing the need for trust and reciprocal communication between fishers and enforcement agencies.

The extinction of the Christmas Island shrew is yet another deeply cautionary tale of a small, cryptic island species lost through the combined, possibly synergic, pressures of invasive species, disease, habitat disturbance, along with a delayed conservation response. Yet, while this shrew is likely to be gone, myriad other island taxa endure and urgently require science-based conservation to avoid a similar fate. Among them is the Príncipe shrew, a Data Deficient species documented across slightly over 10 locations in Príncipe Island and showing extensive overlap with invasive mammals such as cats, civets, and rats (Alves et al., 2024). The (*nowadays*) contrasting tales of these two shrews embody the fragile existence and the precarious resilience of many island species. Despite what has been lost, much island biodiversity is still extant and still recoverable. However, this demands integrated, anticipatory, and participatory approaches such as the ones showcased throughout this special issue. Islands are microcosms of socioecological change and barometers of global biodiversity trends. They demonstrate how quickly extinction can occur—but also how effective conservation can be when grounded in strong science, innovative tools, and collaboration with local communities. By advancing integrative socioecological approaches, improving biosecurity, expanding technological capacity, and prioritizing research on neglected taxa, we can help ensure that island species—both iconic and obscure—continue to persist amid accelerating global change.

KEYWORDS

conservation technology, invasive species, island conservation, socioecological systems

ACKNOWLEDGMENTS

We thank *Conservation Science and Practice* for accepting this special issue, and we are especially grateful to the Editor-in-Chief, Carolina Murcia, for her support throughout the process. We extend our sincere thanks to the authors and reviewers whose hard work and dedication made this issue possible, and we regret that some submitted manuscripts could not be included.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

No datasets were generated or analyzed and thus data sharing is not applicable to this article.

Ricardo Rocha[1]
James C. Russell[2]
Nick D. Holmes[3]
Maria P. Dias[4]
Tomas Chaigneau[5]
Ana Nuno[6,7]

[1]*Department of Biology, University of Oxford, Oxford, UK*
[2]*School of Biological Sciences, University of Auckland, Auckland, New Zealand*
[3]*California Chapter, The Nature Conservancy, Santa Cruz, California, USA*
[4]*cE3c Center for Ecology, Evolution and Environmental Changes & CHANGE – Global Change and Sustainability Institute, Department of Animal Biology, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal*
[5]*Environment and Sustainability Institute, University of Exeter, Cornwall, UK*
[6]*Interdisciplinary Centre of Social Sciences (CICS.NOVA), School of Social Sciences and Humanities (NOVA FCSH), NOVA University Lisbon, Lisbon, Portugal*
[7]*Centre for Ecology and Conservation, Faculty of Environment, Science and Economy, University of Exeter, Cornwall, UK*

Correspondence
Ricardo Rocha, Department of Biology, University of Oxford, 11a Mansfield Rd, OX1 3SZ Oxford, UK.
Email: ricardo.rocha@biology.ox.ac.uk

ORCID

Ricardo Rocha https://orcid.org/0000-0003-2757-7347
James C. Russell https://orcid.org/0000-0002-5901-6416
Maria P. Dias https://orcid.org/0000-0002-7281-4391
Ana Nuno https://orcid.org/0000-0003-4680-2378

REFERENCES

Alves, J. C. T., dos Santos, Y., Guedes, P., & Rocha, R. (2024). Reassessment of the conservation status of Crocidura fingui, a shrew endemic to Príncipe Island, Gulf of Guinea. *Oryx*, *58*(4), 537–540. https://doi.org/10.1017/s0030605323001874

Aslan, C., Holmes, N., Tershy, B., Spatz, D., & Croll, D. A. (2015). Benefits to poorly studied taxa of conservation of bBird and

mammal diversity on islands. *Conservation Biology*, *29*, 133–142.

Berger-Tal, O., & Lahoz-Monfort, J. J. (2018). Conservation technology: The next generation. *Conservation Letters*, *11*(6), e12458.

Bolam, F. C., Mair, L., Angelico, M., Brooks, T. M., Burgman, M., Hermes, C., Hoffmann, M., Martin, R. W., McGowan, P. J., Rodrigues, A. S., Rondinini, C., Westrip, J. R. S., Wheatley, H., Bedolla-Guzmán, Y., Calzada, J., Child, M. F., Cranswick, P. A., Dickman, C. R., Fessl, B., ... Butchart, S. H. M. (2021). How many bird and mammal extinctions has recent conservation action prevented? *Conservation Letters*, *14*(1), e12762.

Brooke, M.d.e. L., Bonnaud, E., Dilley, B. J., Flint, E. N., Holmes, N. D., Jones, H. P., Provost, P., Rocamora, G., Ryan, P. G., Surman, C., & Buxton, R. T. (2018). Enhancing the value of Future Island eradications needs improved understanding of past outcomes. *Animal Conservation*, *21*(1), 19–20.

Burt, A., Nuno, A., & Bunbury, N. (2022). Defining and bridging the barriers to more effective conservation of Island ecosystems: A practitioner's perspective. *Conservation Science & Practice*, *4*(1), e587. https://doi.org/10.1111/csp2.587

Carvalho, M., Fa, J. E., Rego, F. C., De Lima, R. F., Santos, G., & Palmeirim, J. M. (2015). Factors influencing the distribution and abundance of endemic pigeons on São Tomé Island (Gulf of Guinea). *Bird Conservation International*, *25*(1), 71–86.

Collins, C., Patel, A., Cudiamat, M., Nuno, A., Roche, R., Taylor, B., & Curnick, D. J. (2026). Participatory approaches to improving recreational fisheries management in a remote island system. *Conservation Science and Practice*, *8*(3), e70065.

Colosimo, G., Gargano, M., Loreti, P., Bracciale, L., De Luca, M., Catini, A., Di Natale, C., Vera, C., Sevilla, C. R., Gerber, G. P., & Gentile, G. (2022). Remote tracking of Galápagos pink land iguana reveals large elevational shifts in habitat use. *Journal for Nature Conservation*, *68*, 126210. https://doi.org/10.1016/j.jnc.2022.126210

Conenna, I., Rocha, R., Russo, D., & Cabeza, M. (2017). Insular bats and research effort: A review of global patterns and priorities. *Mammal Review*, *47*, 169–182.

de Lima, R. F., Bird, J. P., & Barlow, J. (2011). Research effort allocation and the conservation of restricted-range island bird species. *Biological Conservation*, *144*, 627–632.

Doherty, T. S., Glen, A. S., Nimmo, D. G., Ritchie, E. G., & Dickman, C. R. (2016). Invasive predators and global biodiversity loss. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(40), 11261–11265.

Fernández-Palacios, J. M., Kreft, H., Irl, S. D., Norder, S., Ah-Peng, C., Borges, P. A., Irl, S. D. H., Borges, P. A. V., Burns, K. C., de Nascimento, L., Meyer, J. Y., Montes, E., & Drake, D. R. (2021). Scientists' warning—The outstanding biodiversity of islands is in peril. *Global Ecology and Conservation*, *31*, e01847. https://doi.org/10.1016/j.gecco.2021.e01847

Ferreira, D. F., Gibb, R., López-Baucells, A., Nunes, N. J., Jones, K. E., & Rocha, R. (2022). Species-specific responses to land-use change in Island insectivorous bats. *Journal for Nature Conservation*, *67*, 126177. https://doi.org/10.1016/j.jnc.2022.126177

Fox, M. R., Landers, T. J., Dunphy, B. J., & Russell, J. C. (2026). Temporally-indexed multi-species density impact functions: Quantifying timing and impact of invasive predators on seabird breeding success. *Conservation Science and Practice*, *8*(3), e70157.

Guedes, P., Henriques, M., Dos Santos, Y., Pedroso, A., Andrade, A., Glenn, M. E., Bensen, K. K., Bird, T., & de Lima, R. F. (2026). Introduced mona monkey Cercopithecus mona is a key predator of bird nests in the endemic-rich Príncipe Island. *Conservation Science and Practice*, *8*(3), e70095.

Hartwig, J., & Pinto, C. M. (2026). A cosmopolitan parasite of Rattus in the Galápagos rodents raises conservation concerns. *Conservation Science and Practice*, *8*(3), e70167.

Hong, S. K. (2013). Biocultural diversity conservation for island and islanders: Necessity, goal and activity. *Journal of Marine and Island Cultures*, *2*(2), 102–106.

Jones, H. P., Holmes, N. D., Butchart, S. H., Tershy, B. R., Kappes, P. J., Corkery, I., Aguirre-Muñoz, A., Armstrong, D. P., Bonnaud, E., Burbidge, A. A., & Campbell, K. (2016). Invasive mammal eradication on islands results in substantial conservation gains. *Proceedings of the National Academy of Sciences*, *113*(15), 4033–4038.

Kalaitzakis, I., Rodrigues, A. S. L., Dias, M. P., Davies, T. E., Baran, M. A., Bhola, N., Boulinier, T., Bried, J., Campioni, L., Ceia, F. R., De Pascalis, F., Dehnhard, N., Fagundes, I., Gilg, O., González-Solís, J., Grémillet, D., Hernández-Montero, M., Krüger, L., Kuepfer, A., ... Rouyer, M. (2026). Assessment of land-based threats to Atlantic pelagic seabirds. *Conservation Science and Practice*, *8*(3), e70249.

Kueffer, C., & Kinney, K. (2017). What is the importance of islands to environmental conservation? *Environmental Conservation*, *44*(4), 311–322.

Mandl, I., Ben Ali Abdou, B., Said, I., O'Mara, T., Flanders, J., Said Ali Chaihane, S., Lewis, O. T., Mohamed, M., & Doulton, H. (2026). Home ranges, feeding sites, and daily movement behavior of the highly threatened Livingstone's fruit bat revealed through GPS tracking. *Conservation Science and Practice*, *8*(3), e70208.

Matthew, J. A., Soares, F. C., Thébaud, C., Martin, T. E., & Triantis, K. A. (2022). Threatened and extinct island endemic birds of the world: Distribution, threats and functional diversity. *Journal of Biogeography*, *49*, 1920–1940. https://doi.org/10.1111/jbi.14474

Nori, J., Villalobos, F., Osorio-Olvera, L., & Loyola, R. (2022). Insufficient protection and intense human pressure threaten islands worldwide. *Perspectives in Ecology and Conservation*, *20*(3), 223–230. https://doi.org/10.1016/j.pecon.2022.06.003

Nunes, S. F., Powell, K., Griffith, P., Carretero, M. A., Rebelo, R., Cabeza, M., & Rocha, R. (2026). Island-restricted reptiles are more threatened but less studied than their mainland counterparts. *Conservation Science and Practice*, *8*(3), e70184.

Nyberg, B., Bairos, C., Brimhall, M., Deans, S. M., Hanser, S., Heintzman, S., Hillmann Kitalong, A., Menezes de Sequeira, M., Nobert, N., Rønsted, N., Soaladaob, N., Wood, K. R., & Williams, A. M. (2024). The conservation impact of botanical drones: Documenting and collecting rare plants from vertical cliffs and other hard-to-reach areas. *Ecological Solutions and Evidence*, *5*(1), e12318. https://doi.org/10.1002/2688-8319.12318

Órfão, I., Alvarez, S., Ramalhosa, P., González, C., Vieira, C., Almeida, S., Parretti, P., Freitas, R., Radeta, M., Monteiro, R., Rocha, R., Domingos, I., & Canning-Clode, J. (2024). Searching

for the critically endangered European eel in oceanic islands: A pioneer study in the freshwater systems of Madeira, Macaronesia. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *34*(2), e4106.

Palmeirim, A. F., Araújo-Fernandes, A. C., Castro-Fernandes, A. S., Guedes, P., dos Santos, Y., Alves, J. C., Mata, V., Yoh, N., & Rocha, R. (2026). Habitat use and diel activity of insectivorous bats across land-cover types on an Afrotropical oceanic island. *Conservation Science and Practice*, *8*(3), e70143.

Philip, M., Ducatez, S., & DeVore, J. L. (2026). Drivers of variation in yellow crazy ant (*Anoplolepis gracilipes*) abundance and impacts on native fauna in an atoll ecosystem. *Conservation Science and Practice*, *8*(3), e70187.

Porriños, G., Doherty, P. D., Nuno, A., Da Graça, M., dos Santos, E., Espírito Santo, S., Walker, K., Santos, A., Guedes, M., Nazaré, L., Capela Lourenço, T., Madruga, L., Matos, L., Mulligan, B., Navas, M., Ramos, R. F., da Rocha, N., & Metcalfe, K. (2026). Monitoring small-scale fisheries through participatory, smartphone-based surveys in the tropical archipelago of São Tomé and Príncipe. *Conservation Science and Practice*, *8*(3), e70161.

Rando, J. C., Pieper, H., Pereira, F., Torres-Roig, E., & Alcover, J. A. (2024). Petrel extinction in Macaronesia (North-East Atlantic Ocean): The case of the genus Pterodroma (Aves: Procellariiformes: Procellariidae). *Zoological Journal of the Linnean Society*, *202*(2), zlae123. https://doi.org/10.1093/zoolinnean/zlae123

Rato, C., Oliveira, P., Menezes, D., Funk, S. M., Rebelo, R., Nogales, M., & Rocha, R. (2024). The relevance of evolutionary significant units for the conservation of island-restricted reptiles: *Tarentola boettgeri bischoffi* as a case study. *Amphibia-Reptilia*, *45*(3), 279–290. https://doi.org/10.1163/15685381-bja10184

Russell, J. C., & Kaiser-Bunbury, C. N. (2019). Consequences of multispecies introductions on island ecosystems. *Annual Review of Ecology, Evolution, and Systematics*, *50*(1), 169–190.

Russell, J. C., & Kueffer, C. (2019). Island biodiversity in the Anthropocene. *Annual Review of Environment and Resources*, *44*(1), 31–60.

Russell, J. C., Meyer, J. Y., Holmes, N. D., & Pagad, S. (2017). Invasive alien species on islands: Impacts, distribution, interactions and management. *Environmental Conservation*, *44*(4), 359–370.

Savage, J., Harris, J. L., Koldewey, H. J., Letessier, T. B., Rowcliffe, M., & Morritt, D. (2026). No escape from microplastics: Contamination of reef manta ray feeding areas in a remote, protected archipelago. *Conservation Science and Practice*, *8*(3), e70059.

Smith, D., Clarke, R. H., Gillings, D., & Will, D. (2026). Drones: Emergence of a transformative technology for island rodent eradications. *Conservation Science and Practice*, *8*(3), e70139.

Soto, E. J., Nunes, J., Nobrega, E., Palmeirim, A. F., & Rocha, R. (2023). Density and ecological drivers of free-ranging cat abundance and activity in Madeira Island, Macaronesia. *Conservation Science and Practice*, *5*(12), e13040. https://doi.org/10.1111/csp2.13040

Steibl, S., Wilkinson, S. P., Will, D. J., Gemmell, N. J., & Russell, J. C. (2026). Environmental DNA for invasive rat surveillance and biosecurity on islands. *Conservation Science and Practice*, *8*(3), e70044.

Tershy, B. R., Shen, K.-W., Newton, K. M., Holmes, N. D., & Croll, D. A. (2015). The importance of islands for the protection of biological and linguistic diversity. *Bioscience*, *65*, 592–597.

Woinarski, J. C. Z., & Burbidge, A. A. (2025). Crocidura trichura. The IUCN Red List of Threatened Species 2025: e.T136379A254622730. https://doi.org/10.2305/IUCN.UK.2025-2.RLTS.T136379A254622730.en. Accessed 8 March 2026.

Woinarski, J. C., Tiernan, B., & Legge, S. M. (2023). Should the Christmas Island shrew (*Crocidura trichura*) be considered extinct? *Australian Mammalogy*, *46*(1), AM23033. https://doi.org/10.1071/AM23033