ARPHA Conference Abstracts 9: e202999
doi: 10.3897/aca.9.e202999

OPEN ACCESS

Conference Abstract

Non-native terrestrial spermatophytes in protected areas of continental Ecuador: a baseline inventory and drivers of non-native species richness

Ileana Herrera[‡,§], Kevin Panchana[‡], Anahí Vargas[|], Isabella Dillon[‡], Amelia Arcos-Andrade[‡], Estefany Goncalves[¶], José R. Ferrer-París[#], Jordi López-Pujol[¤]

‡ Universidad Espiritu Santo (UEES), Samborondon, Ecuador
§ Instituto Nacional de Biodiversidad (INABIO), Quito, Ecuador
| Universidad de Chile, Santiago, Chile
¶ Universitat de Barcelona, Barcelona, Spain
# University of New South Wales, Sydney, Australia
¤ Botanic Institute of Barcelona (IBB, CSIC-ICUB), Barcelona, Spain

Corresponding author: Ileana Herrera (herrera.ita@gmail.com)

Received: 06 Jun 2026 | Published: 06 Jun 2026

Citation: Herrera I, Panchana K, Vargas A, Dillon I, Arcos-Andrade A, Goncalves E, Ferrer-París JR, López-Pujol J (2026) Non-native terrestrial spermatophytes in protected areas of continental Ecuador: a baseline inventory and drivers of non-native species richness. ARPHA Conference Abstracts 9: e202999. https://doi.org/10.3897/aca.9.e202999

Abstract

Protected areas (PAs) are central to biodiversity conservation, yet they are increasingly exposed to biological invasions. In continental Ecuador, information on non-native terrestrial spermatophytes in PAs remains scattered across biodiversity platforms, scientific and grey literature, and management documents, limiting broad-scale assessments and management planning. We compiled, validated, and integrated records of non-native terrestrial spermatophytes across 68 continental PAs of the Ecuadorian National System of Protected Areas (*Sistema Nacional de Áreas Protegidas*, SNAP its Spanish acronym) using GBIF, iNaturalist, peer-reviewed and grey literature, official management plans, and complementary field observations. Records were taxonomically

© Herrera I et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

standardized, curated, and assigned to individual PAs. To explain variation in non-native richness, we evaluated predictors grouped into four categories:

1. PA basic attributes (e.g., extent, year of PA designation),
2. propagule pressure and introduction pathways,
3. anthropogenic disturbance, and
4. abiotic environmental conditions.

Total non-native taxon richness was modelled using generalized linear models (GLMs). We compiled and validated 3,480 occurrence records, including 2,117 observations from citizen science platforms, 687 herbarium specimens, 371 records from peer-reviewed articles, 123 field observations, 106 thesis records, and 76 inventory records derived from management documents. These records represented 486 non-native taxa from 86 families and 320 genera. Poaceae (55 taxa), Asteraceae (38), and Fabaceae (37) were the richest families, together accounting for approximately 27% of all non-native taxa. Across the full dataset, 204 taxa were recorded only in the wild, 188 only as cultivated, 90 in both conditions, and four remained uncertain in establishment status. Seventeen (25%) PAs had no recorded non-native taxa, whereas Pululahua Geobotanical Reserve and Cayambe-Coca National Park were the richest, with 174 and 172 taxa, respectively. Nearly half of all taxa (47.3%) were recorded in only one PA, while the most widespread taxa, *Taraxacum* sect. *Taraxacum* and *Trifolium repens*, occurred in 17 PAs each. Our dataset included four of the species listed among the world's worst invasive alien species: *Arundo donax*, *Leucaena leucocephala*, *Rubus ellipticus*, and *Spathodea campanulata*. The selected GLM identified year of PA designation, extent, distance to the nearest urban area, human density, road density, median human impact, terrain ruggedness, and management type as the main predictors of non-native richness. Richness increased with time since PA designation, extent, road density, median human impact, and terrain ruggedness, while state-managed PAs showed lower expected richness. These results indicate that non-native spermatophytes richness in PA is strongly shaped by propagule pressure, human accessibility, and landscape complexity. Notably, richness increased with time since PA designation, a pattern that contrasts with expectations and may be associated with cumulative introduction history or differences in sampling effort among PAs. This study provides the first integrated national baseline of non-native terrestrial spermatophytes across continental Ecuadorian PAs. By combining heterogeneous data sources into a standardized workflow, it provides a practical foundation for surveillance, early detection, and prioritization of management in a biodiverse yet under-assessed PA network.

Keywords

alien flora, citizen science, invasion pathways, species richness, tropical Andes

Presenting author

Ileana Herrera

Presented at

Neobiota 2026, the 14th International Conference on Biological Invasions

Conflicts of interest

The authors have declared that no competing interests exist.