

Early detection of invasive species on roadside slopes in Andean Patagonian forests of *Austrocedrus chilensis* (Argentina)

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INTRODUCTION & AIM

The invasion of exotic plants threatens biodiversity, affecting ecosystem services and ecological processes in native ecosystems [1]. Road construction creates new environments and contributes to the introduction and spread of exotic and invasive plants. This study aimed to analyze the contribution of different functional groups (annual herbs and grasses, perennial herbs and grasses, shrubs, and trees) to the invasion of exotic species on roadside cut slopes in the *Austrocedrus chilensis* (ciprés) forest in northwest Andean Patagonia, Argentina.

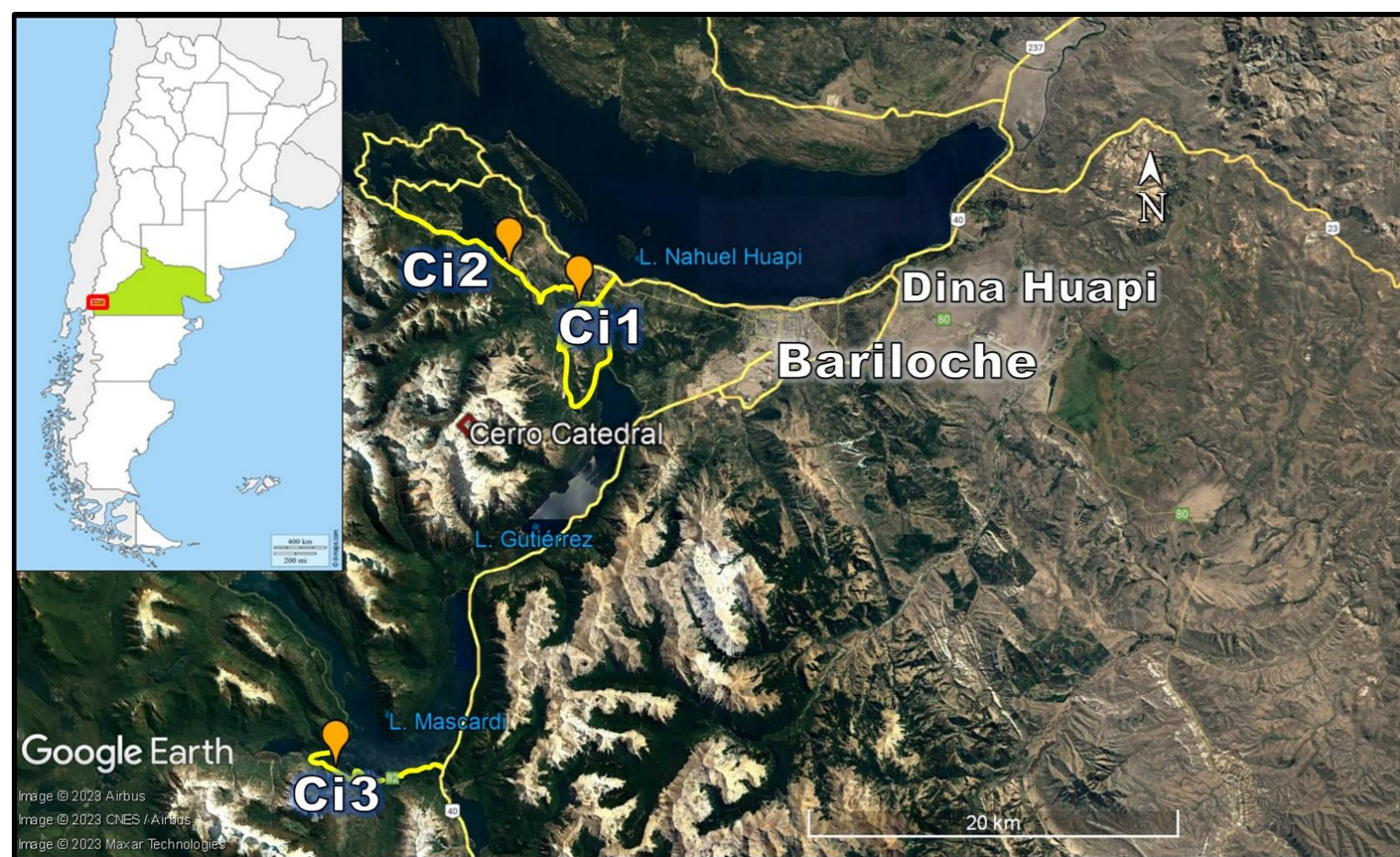


Fig 1. Location of study area, including sampling locations in the *Austrocedrus chilensis* forest (ciprés; Ci1, Ci2, Ci3).

METHOD

At tree sampling location, two sites of 50 m × 5 m (250 m²) were selected for vegetation assessment: a degraded roadside slopes (RSs) adjacent to the road, and a reference area site (RAs) 20 m away from the road in the opposite direction (Fig.1 y 2). The cover of native, exotic, and invasive species from the functional groups were evaluated in 15 plots of 1 m² at each sites, using the Braun-Blanquet method (Fig.3) [2].



Fig 2. Roadside slope (right, indicated by yellow arrow) and reference area (left) of the *Austrocedrus chilensis* forest.

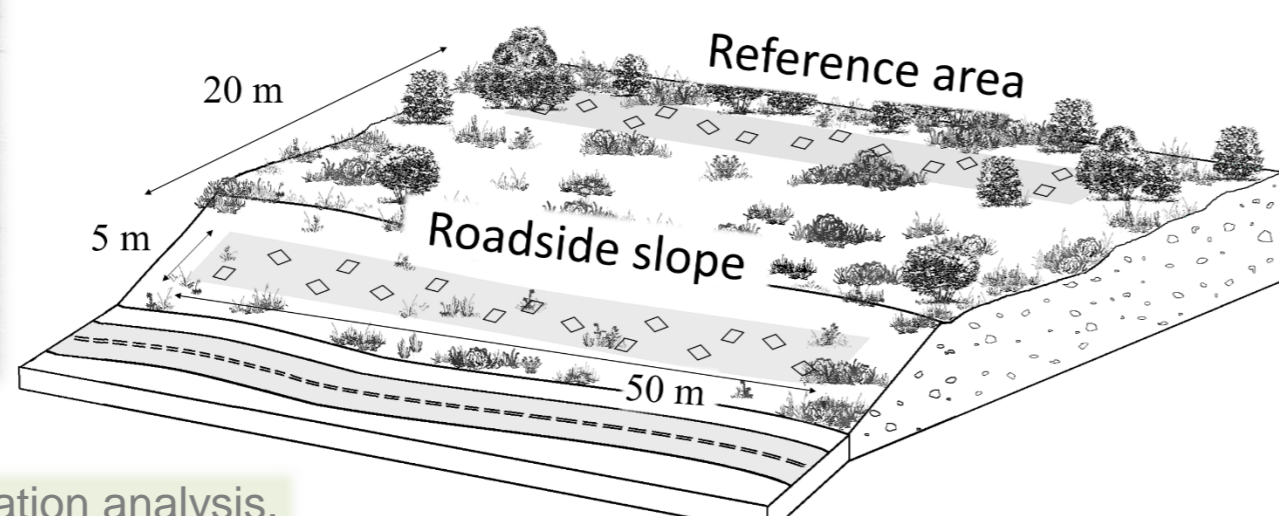


Fig 3. Sampling design for vegetation analysis, showing 1 m² plots (square) at each site.

RESULTS & DISCUSSION

It was found that invasive perennial herbs and grasses predominated on RSs, with cover (19.6±3.0%) higher than that of RAs (8.9±1.5%) (Fig.4). *Agrostis capillaris* and *Rumex acetosella* were the most abundant invasive species. Native shrubs and perennial herbs and grasses were predominant on RSs, with *Baccharis rhomboidalis* and *Acaena pinnatifida* being the most abundant.

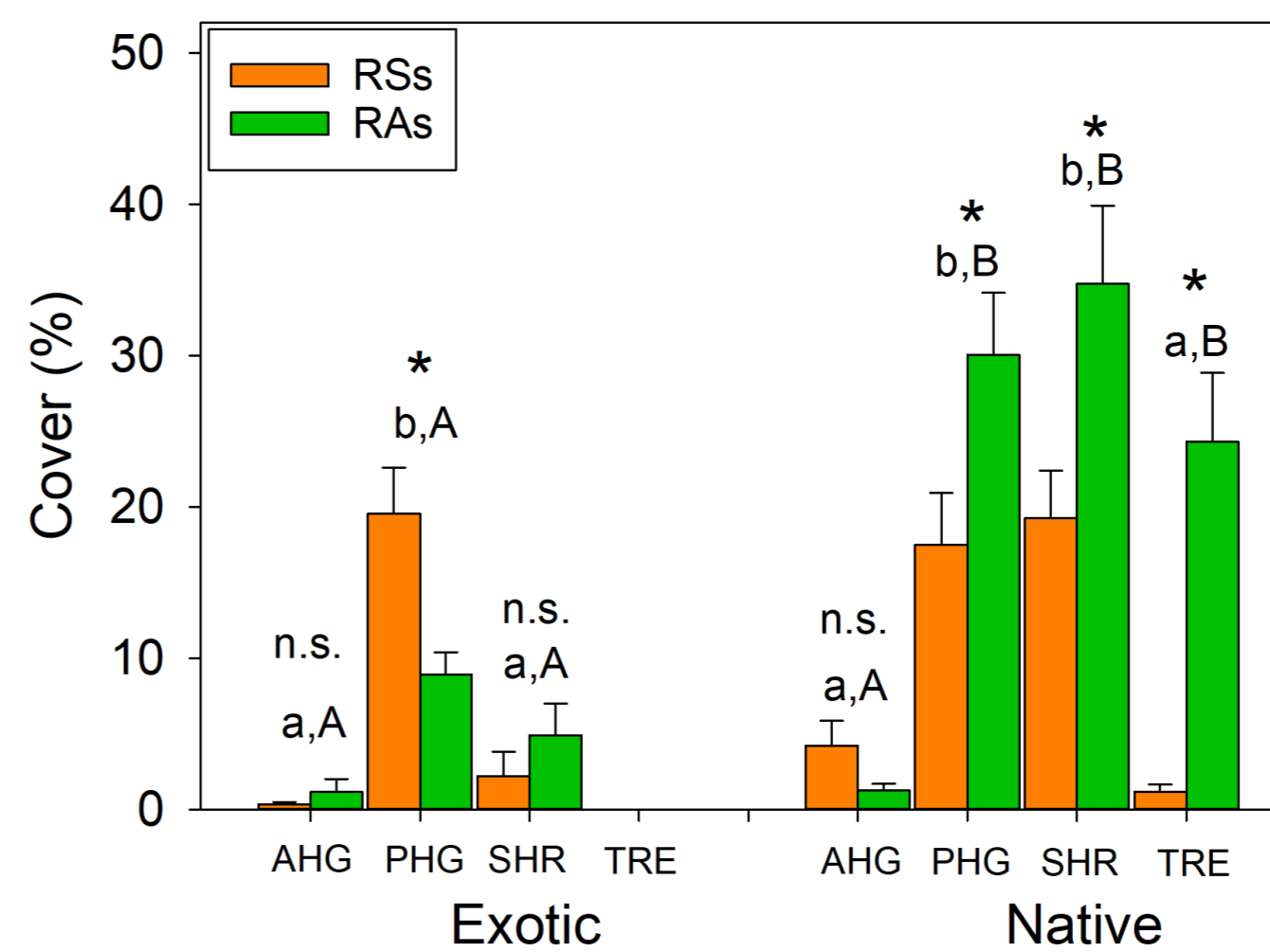


Fig 4. Mean cover (%) ± (SE) of exotic and native species grouped by functional groups (AHG: annual herbs and grasses, PHG: perennial herbs and grasses, SHR: shrubs, TRE: trees) on roadside slopes (RSs) and reference areas (RAs) of *Austrocedrus chilensis* forests. *indicates significant differences between RSs and RAs ($P < 0.05$), while "n.s." denotes non-significant differences. Lowercase letters indicate significant differences ($P < 0.05$) among functional groups within RSs, while capital letters indicate significant differences ($P < 0.05$) within RAs.



The disturbances caused by road slopes in *Austrocedrus chilensis* forest alter species composition and promote the presence of invasive exotic species, consistent with previous studies [3]. The habitats in roadside slopes have high light and nutrient availability, and reduced competition, conditions that favor the establishment and spread of invasive species [4].

CONCLUSION

This study demonstrates that the roadside slopes of the *Austrocedrus chilensis* forest harbor invasive exotic species that can invade nearby natural areas. Early detection of these species is important for proper management and control, thus promoting the conservation of biodiversity in forest environments.

REFERENCES

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