

# DIET COMPOSITION AND ECOLOGICAL INSIGHTS OF SYMPATRIC POPULATIONS OF MARINE OTTER AND AMERICAN MINK IN THE VALDIVIAN COASTAL ZONE, CHILE

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## INTRODUCTION

The coexistence of the marine otter (*Lontra felina*) and the American mink (*Neogale vison*) has been documented in Calfuco, Valdivia (Calvo *et al.*, 2024). *N. vison*, in its invasive state, represents one of the greatest threats to global biodiversity due to its high adaptive plasticity (Schiaffini *et al.*, 2022). It can impact native fauna by altering prey availability and facilitating disease transmission (Valenzuela *et al.*, 2016). *L. felina* is one of the smallest otter species in the world and the only member of the *Lontra* genus that primarily inhabits marine ecosystems (Wilson & Mittermeier, 2009; Valqui & Rheingantz, 2021). To date, no studies have assessed the ecological impact of this invasive species on *L. felina*.

## OBJECTIVE

Characterize and compare the diet of *L. felina* and *N. vison* in the localities of Pilolcura and Calfuco in Valdivia, Chile.

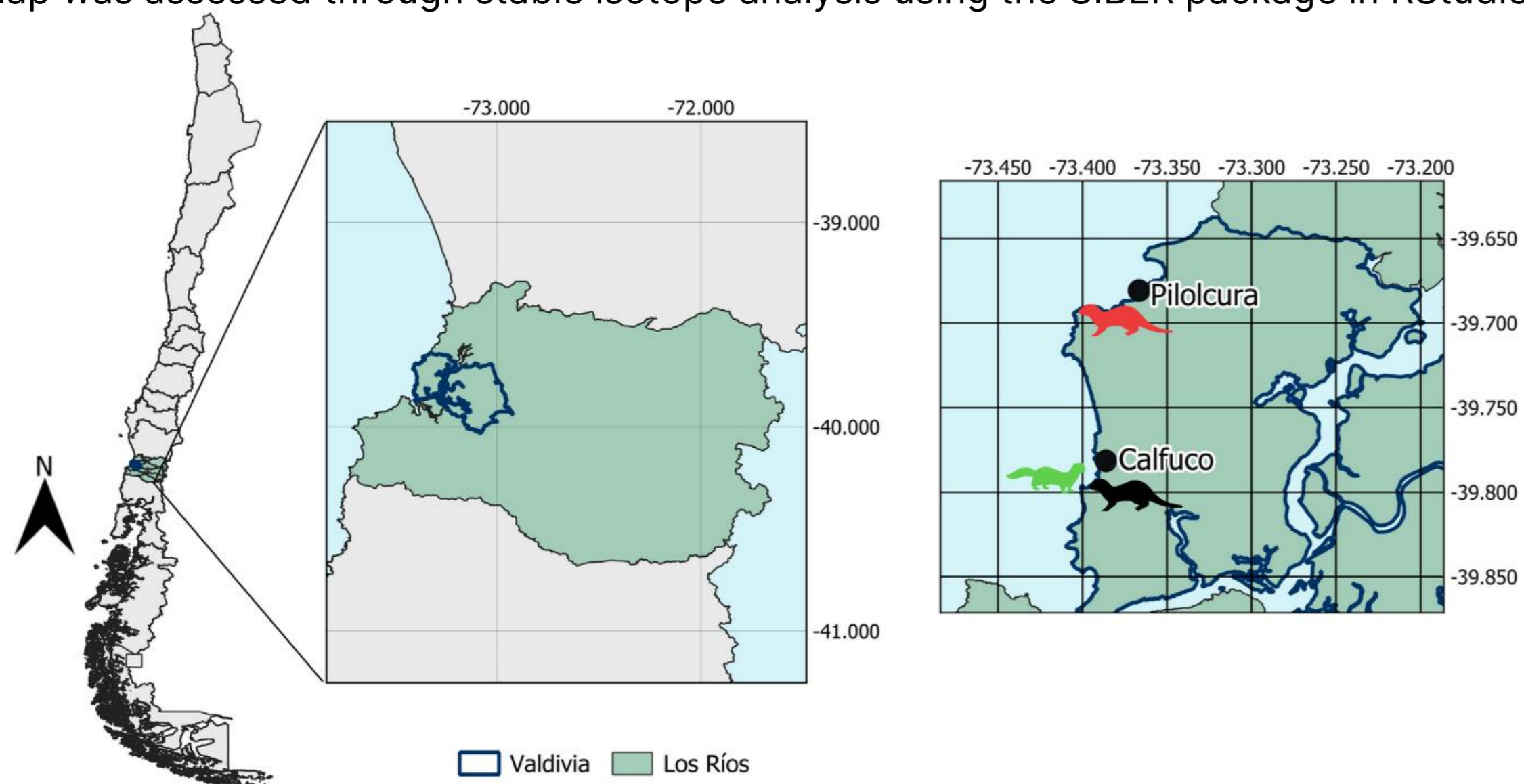
## SPECIFIC OBJECTIVES

- 1.- Analyze the diet composition of *L. felina* and *N. vison* through the examination of fecal samples collected between January and February 2019.
- 2.- Compare the isotopic niche of *L. felina* and *N. vison* through stable isotope analysis.
- 3.- Determine the degree of dietary overlap between *L. felina* and *N. vison* along the coast of Valdivia.

## METHOD



The study was conducted in two locations along the Valdivian coast, Chile: Calfuco, where *N. vison* and *L. felina* coexist, and Pilolcura, where no mink presence was detected. Samples were collected from both sites, including vibrissae for stable isotope analysis and scats for direct diet analysis. Scat samples were examined to identify prey items, calculating their occurrence, relative frequency, and diet overlap using Renkonen's index. Isotopic niche overlap was assessed through stable isotope analysis using the SIBER package in RStudio.



The following samples were collected:



Otter and mink scats

vibrissae

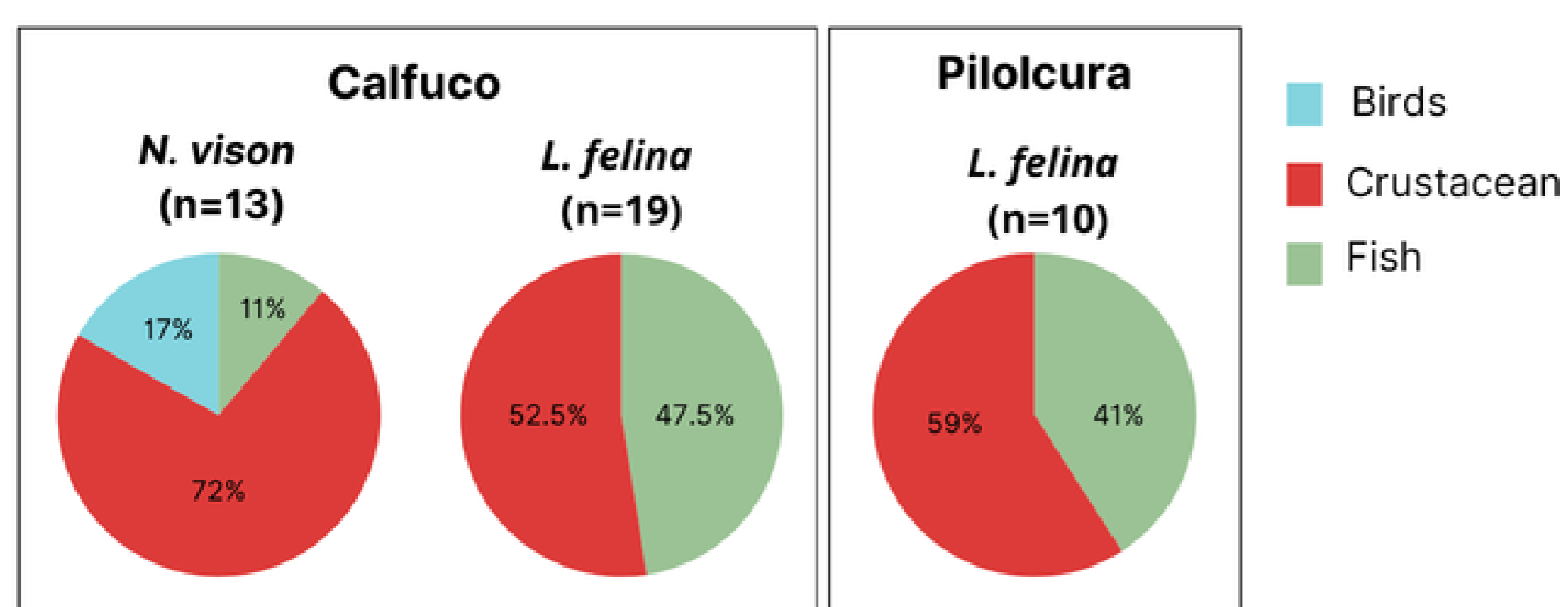
Direct Analysis

Stable isotope analysis

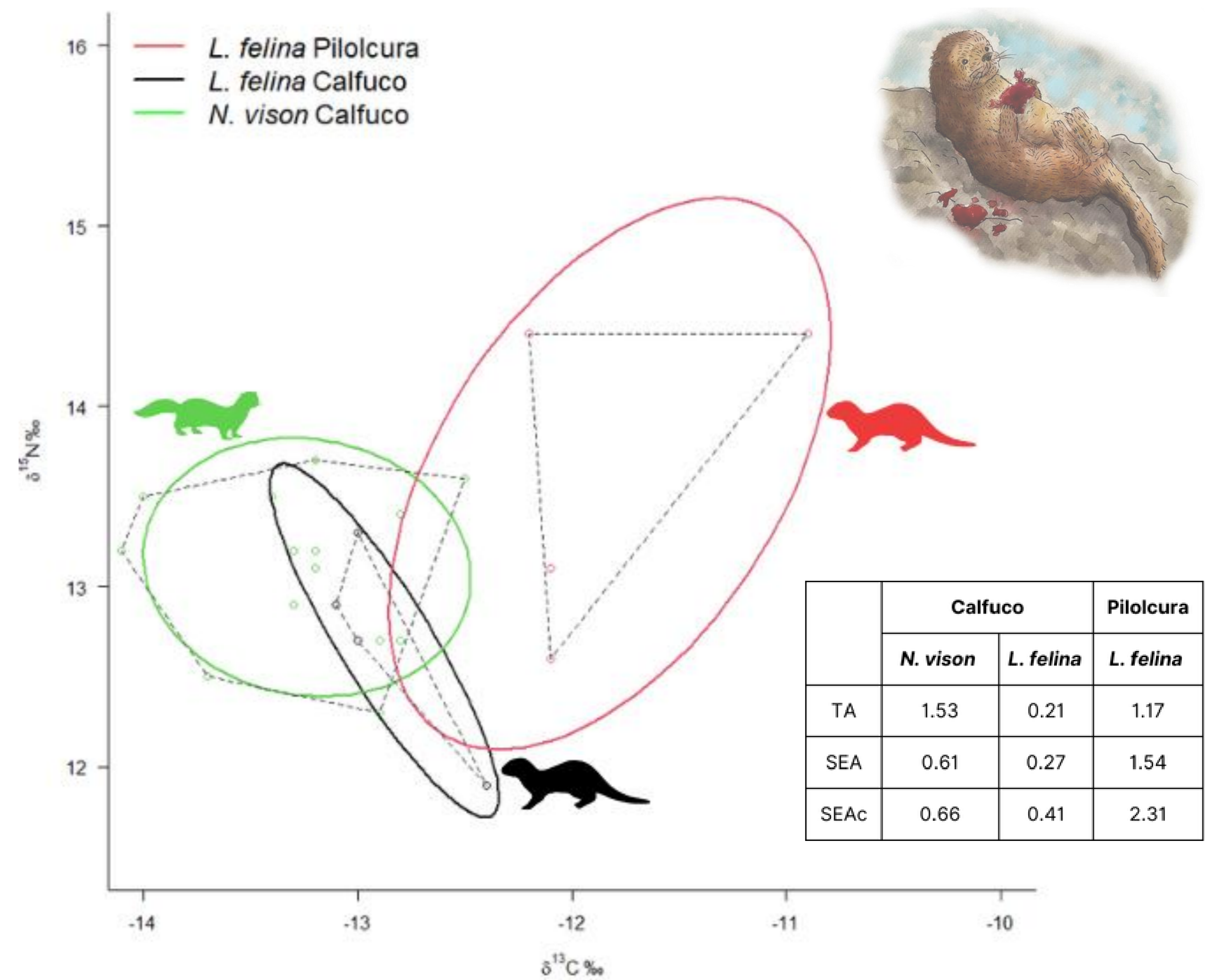
- Identify Prey items:
- Occurrence
  - Relative Frequency
  - Renkonen Index (overlap)

SIBER R Studio

## RESULTS



Both species prefer crustaceans over other prey groups. *L. felina* consumes a higher percentage of fish in the presence of *N. vison*.



Bidimensional isotopic niche diagram ( $\delta^{13}\text{C}$ – $\delta^{15}\text{N}$ ) of the studied species. Dashed-line polygons represent the total area (TA). Solid-line ellipses indicate the standard ellipse area corrected (SEAc) for each species.

*L. felina* from Pilolcura exhibits a broader isotopic niche compared to *L. felina* from Calfuco. The carbon isotopic values of *L. felina* in Pilolcura are higher than those observed in the study groups from Calfuco, with *N. vison* displaying the most negative values. For nitrogen isotopes, *L. felina* from Pilolcura presents the highest values; however, in Calfuco, *N. vison* exhibits the highest nitrogen signatures.



Groups	Overlap	
	SIBER	Renkonen Index
Between <i>N. vison</i> and <i>L. felina</i> in Calfuco	33%	43.6%
Between <i>L. felina</i> from Calfuco and Pilolcura	14%	55%

Overlap between *N. vison* and *L. felina* in Calfuco, as well as between *L. felina* from Calfuco and Pilolcura, calculated using SIBER and the Renkonen index.

The results differ significantly between the two methods.

## DISCUSSION & CONCLUSIONS

- The results suggest that *N. vison* may be consuming fishery discards, as fecal analysis only revealed fish spines, and its isotopic values indicate a greater reliance on marine resources.
- The isotopic niche of *L. felina* in Pilolcura is broader, possibly due to low anthropogenic impact and the absence of *N. vison*.
- Phytoplankton-based food webs have more negative carbon signatures than those based on benthic macroalgae (France, 1995), suggesting differences in prey composition. *L. felina* may consume more mollusks, which are not detectable through fecal analysis.
- Dietary overlap between 40–60% indicates moderate trophic interaction without significant competition between species (Colwell & Futuyma, 1971).
- The optimal sample size for isotopic analysis ( $n > 30$ ) was not reached, limiting statistical robustness (Jackson *et al.*, 2011), yet the data provide insights into trophic ecology.
- Despite data limitations, this study is the first to compare both techniques to investigate interactions between these species. Although the results are not conclusive, they provide a valuable foundation for future research.



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