

INTRODUCTION

The Tropical Andes region is a global biodiversity hotspot (Myers et al. 2000). In Colombia the Andean ecosystem has suffered large scale transformation, due to agricultural intensification and urbanization, leading to many native species suffering conservation threats. Additionally, populations of many tree species in the Lecythidaceae and other families have been decimated, even within forest fragments, due to exploitation as timber resources. Studies of population viability analysis of these timber species are scarce. In this study we evaluated the conservation status of the timber species *Gustavia speciosa* through distribution analysis and a demographic study in the Cauca river Valley, and the development of the Barcode of Life for the species.



Figure 1. *Gustavia speciosa* A. Flower, B. Fruit & C. Canopy & bark

CONCLUSIONS

This work found the population of *G. speciosa* to be in equilibrium, although the high permanency and low population growth is of concern (Figure 3). Continued monitoring, in particular for seedlings and juveniles is recommended, with implementation of measures, such as seedling rescue (Figure 4, 5), to improve survival, increase population growth, and ensure population maintenance (Figure 6, 7). The level of humidity and its availability gradient are determining factors for this species distribution, and should be taken into consideration in defining objectives for propagation and population restoration (Figure 8). A minority of the species distribution occurs in protected areas. Conservation actions are recommended to increase protected area coverage of the species distribution, as well as undertake translocations of the species to existing protected areas.

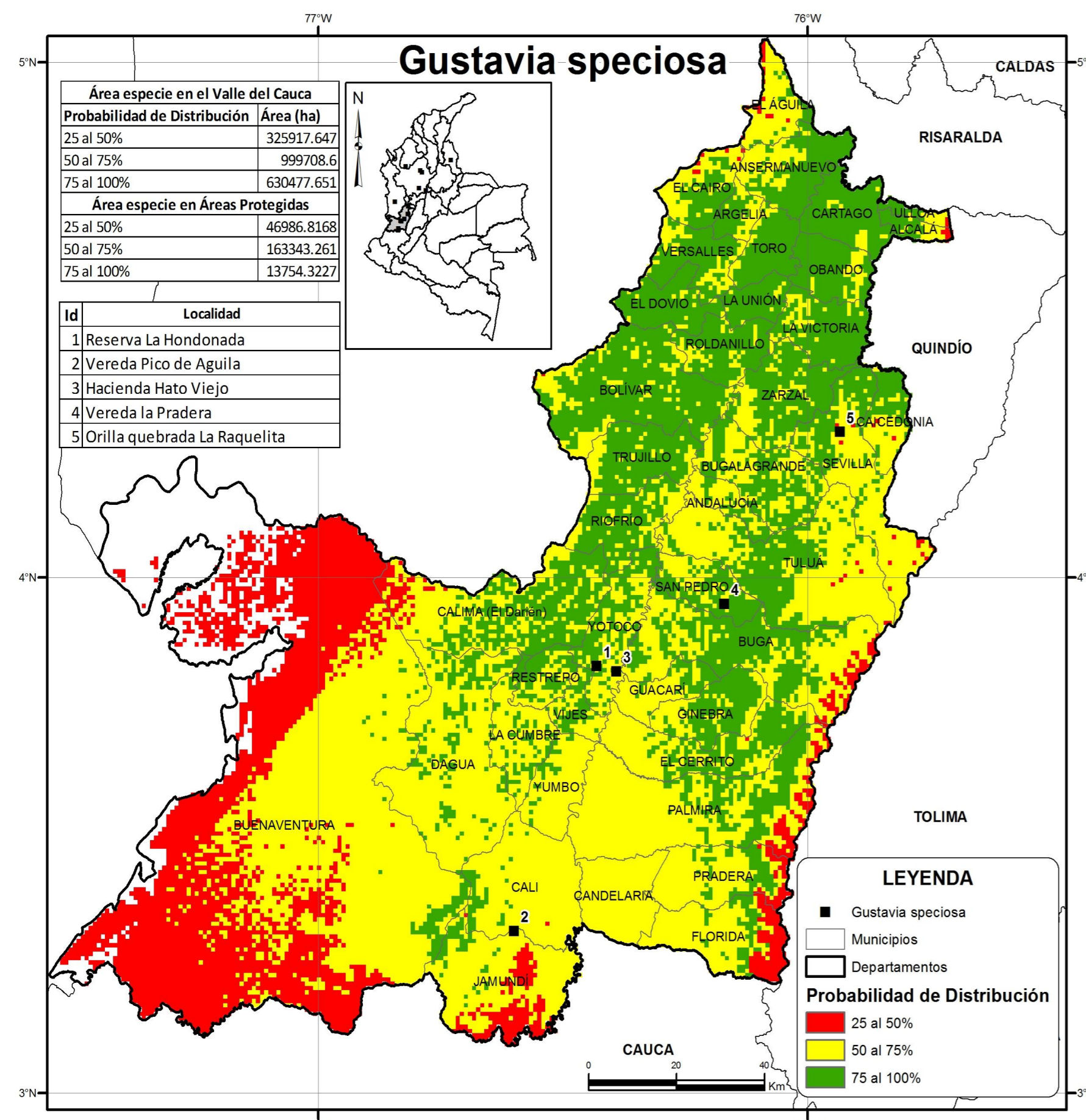


Figure 8. Potential geographic distribution of *Gustavia speciosa* in the Valle del Cauca Department, Colombia.

METHODS

- *Gustavia speciosa*, first collected by Humboldt & Bonpland close to Mariquita, in the Magdalena River valley, is distributed in the inter-Andean valleys of Colombia and Ecuador, and is registered NT by the IUCN. The species is commonly known as "Chupo" (Prance y Mori, 1979) in Colombia.
- The potential distribution on the species for the Valle del Cauca department was modelled with Maximum Entropy ver. 3.3.3k (Phillips et al., 2004) using data from GBIF and from herbaria including CUVV, VALLE, TUL, COL, MO.
- Population viability analysis (Caswell 2001) was undertaken in the Civil Society Reserve, La Hondonada in the Municipality of Yotoco-Valle del Cauca. Demographic characterization was conducted in Gentry-type field plots (Gentry 1982) in two censuses in June 2016 and 2017.
- Leaf samples were taken from two populations in the Cauca River Valley, Hondonada y Alejandría. DNA was extracted with the kit DNEasy® Plant Mini kit de QIAGEN (QIAGEN, 2011), and PCR amplified for the plastid regions *rbcl*, *matK*, *trnH-psbA* and the rRNA-ITS region of the nuclear genome.

RESULTS

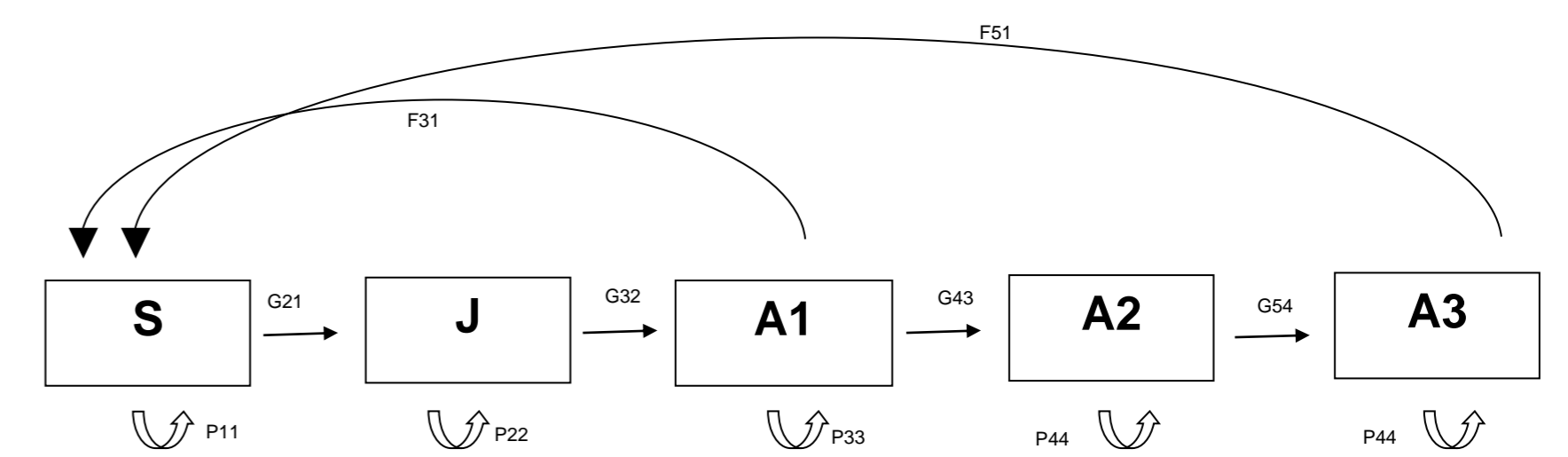


Figure 2. Life cycle diagram, Population structure by class size and transitions, seedlings, juveniles, adults 1 to 3.

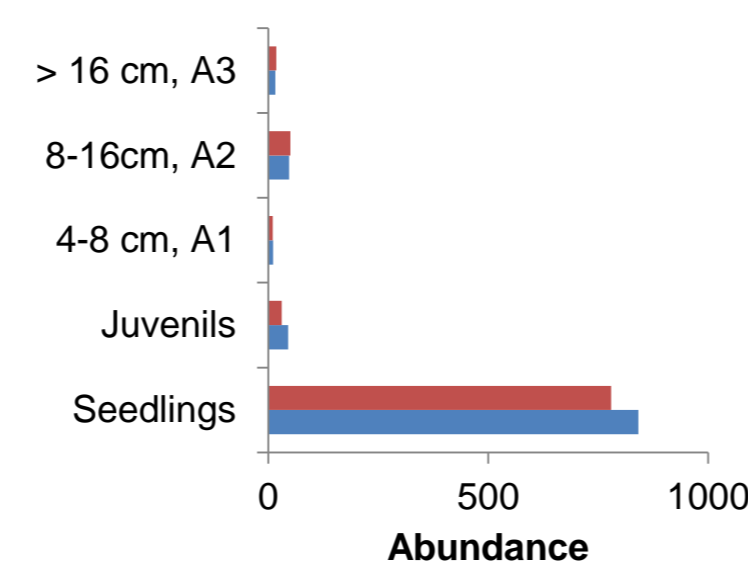


Figure 4. Abundance by class size.

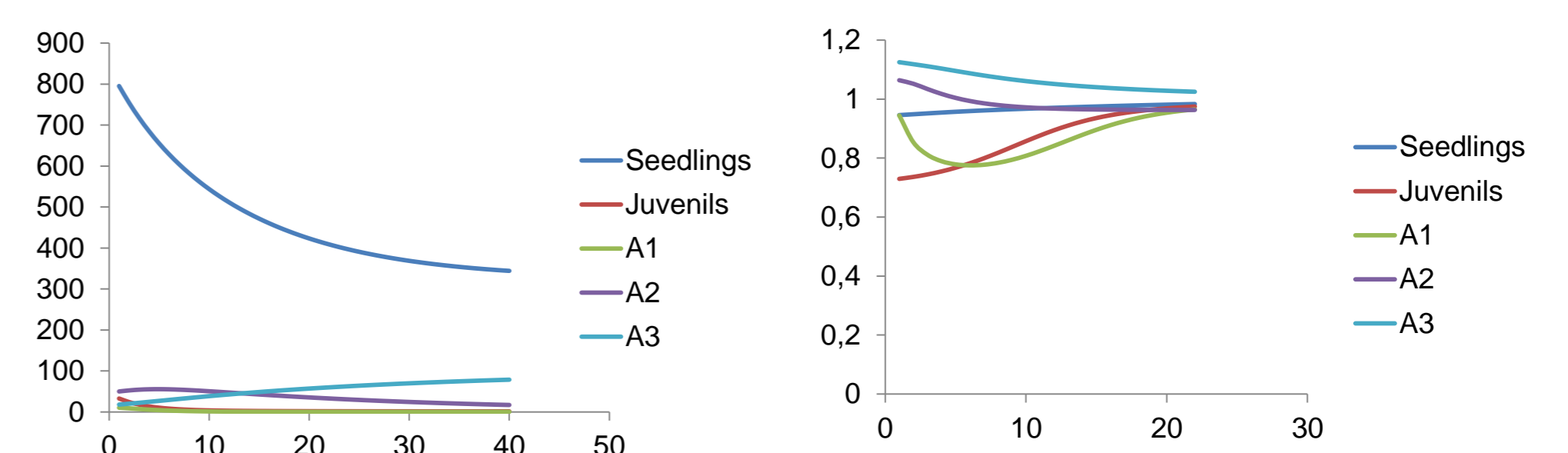


Figure 3. Abundance and rate of population growth λ over time

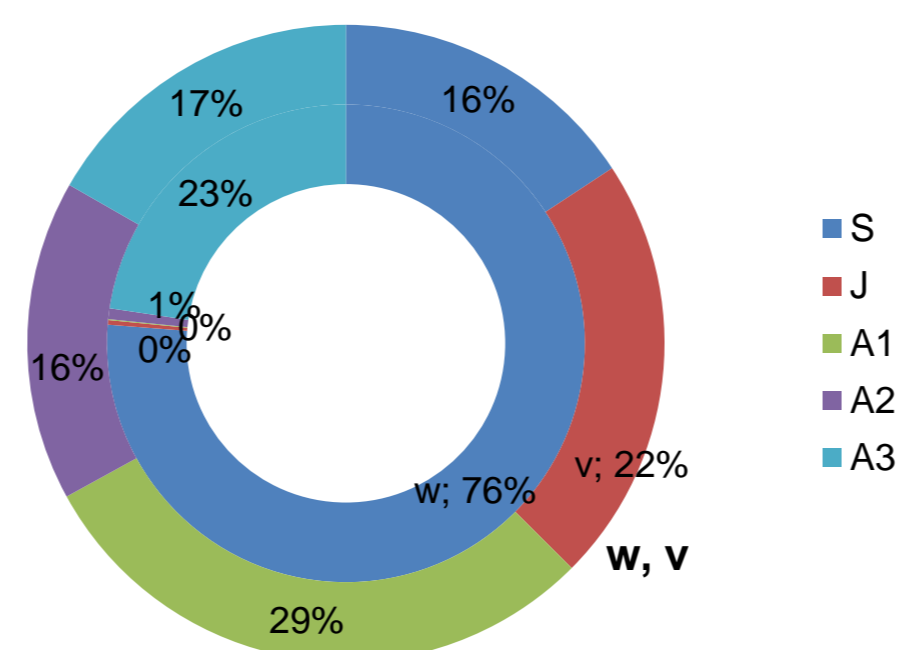


Figure 5. w, population stable structure; v, reproductive value by class size.

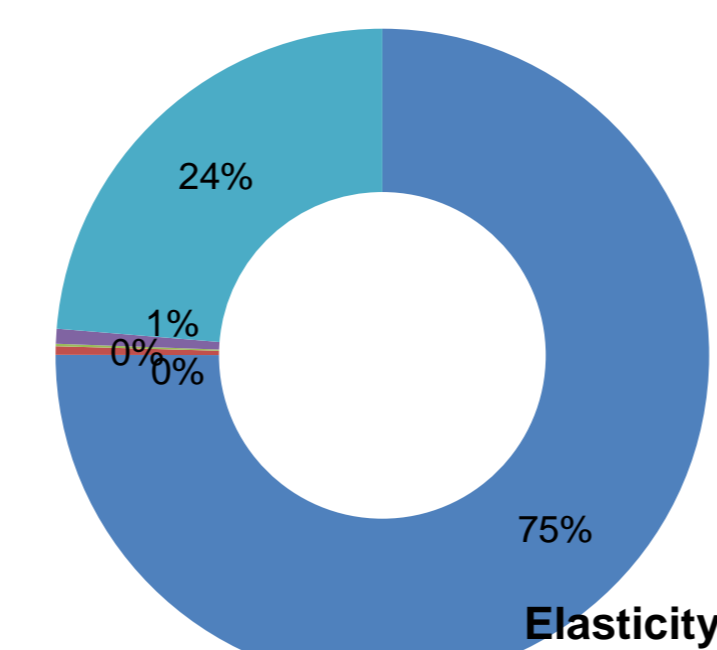


Figure 6. Elasticity by class size.

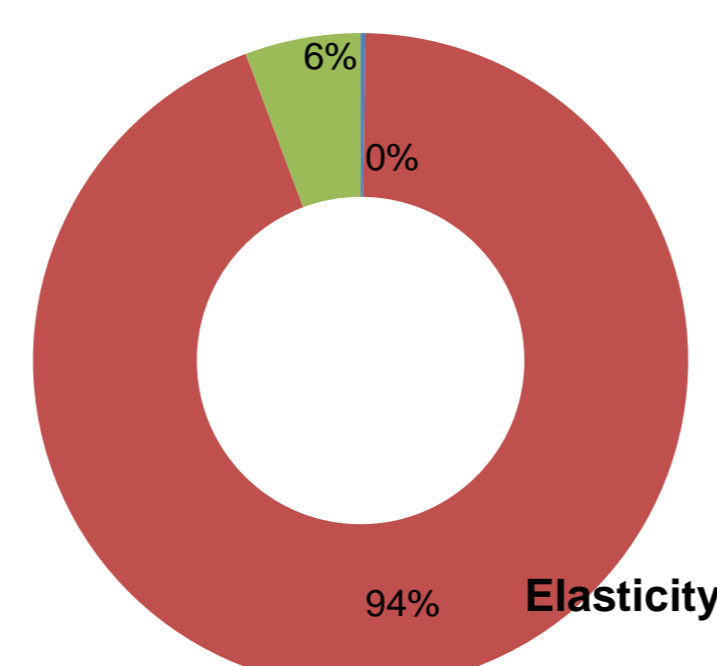


Figure 7. Elasticity by transition type.

