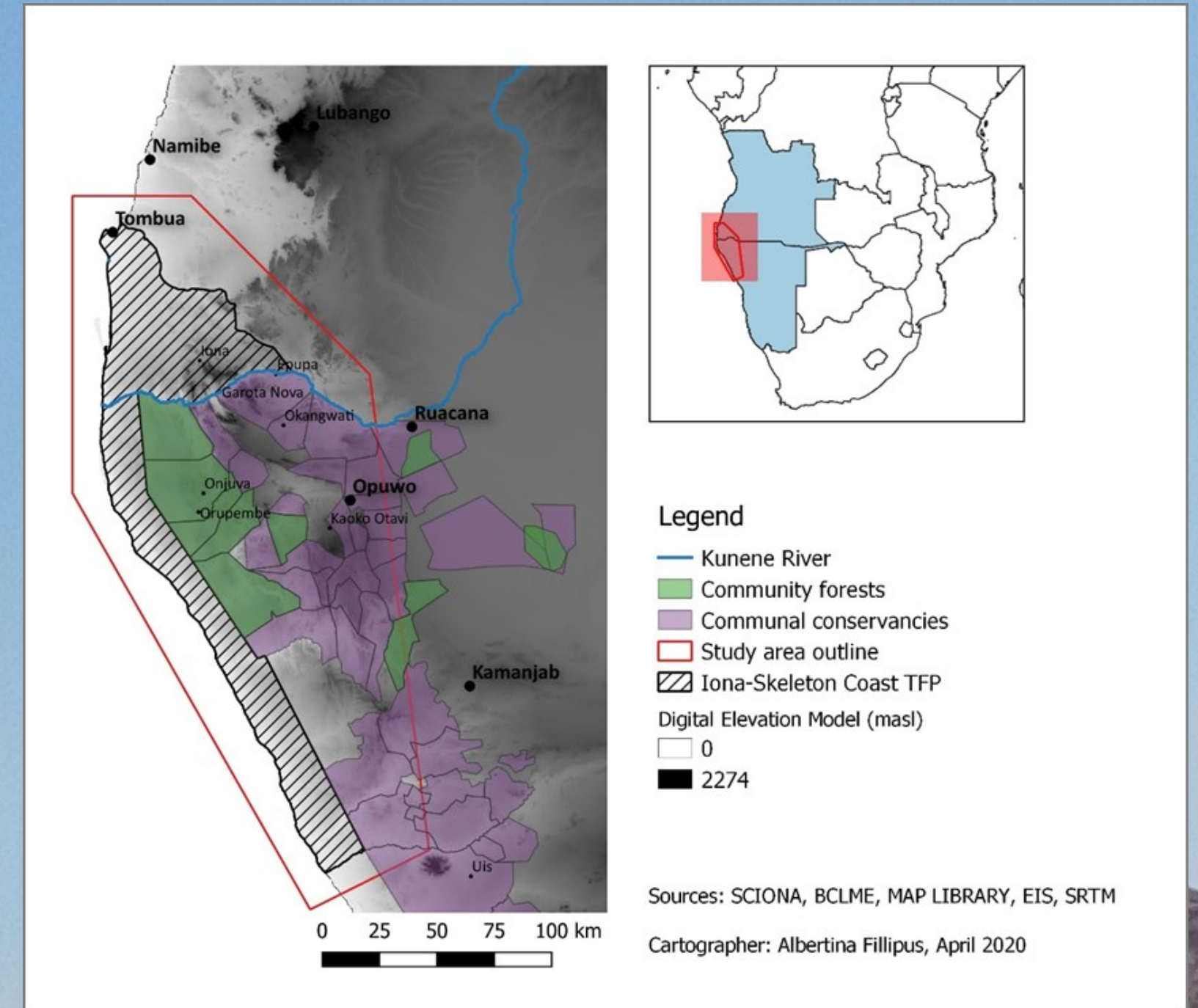


MAPPING AND PREDICTING THE DISTRIBUTION OF SELECTED ECOLOGICAL AND SOCIO-ECONOMIC IMPORTANT ENDEMIC WOODY SPECIES OF THE NORTHERN KAKOVELD, NAMIBIA - ANGOLA

Albertina Fillipus, Rolf W. Becker, Wessel Swanepoel, Vera De Cauwer, 2020

Kaokoveld centre of endemism

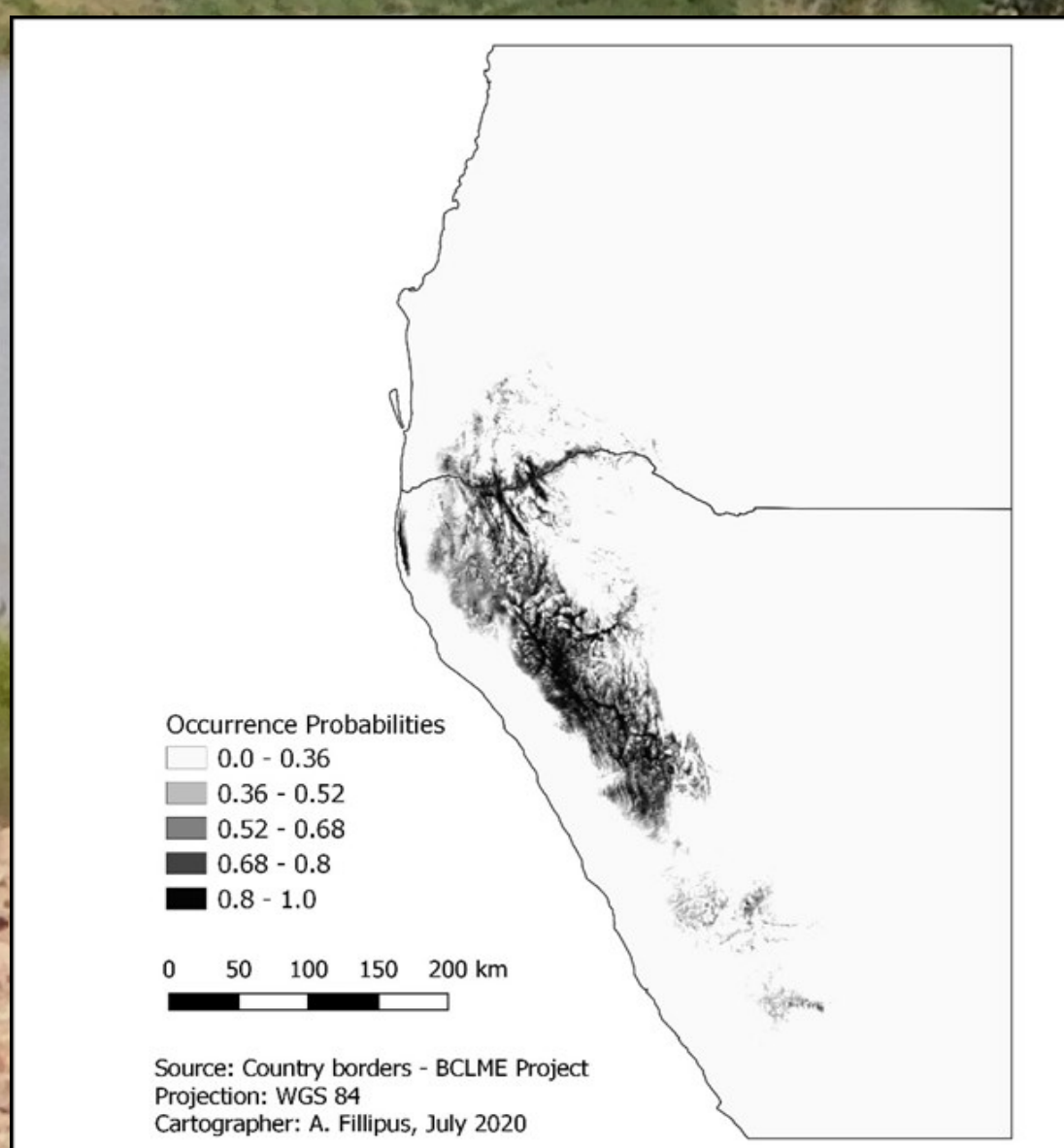
South-western Angola and north-western Namibia, also known as the Kaokoveld which extends from north of Moçâmedes southwards to the Kuiseb River, share unique species which are either endemic or near-endemic to both countries (Craven 2002, 2009). This zone is characterized by a rich species diversity with a high proportion of endemics (Simmons *et al.* 1998, Craven 2002, 2009, Craven and Vorster 2006). The Kaokoveld is one of Namibia's two centres of diversity and endemism and the number of species recorded for the Kaokoveld is remarkable, with a high proportion of species that are endemic to this area [and more species are still being discovered] (Craven 2002, Burke 2012). Significant areas for the localized endemics are the Otjihipa and Baynes Mountains and the Khuwarib Schlucht in the south (Simmons *et al.* 1998). Almost all growth forms are represented among the endemics, but the majority are dwarf shrubs (Simmons *et al.* 1998, Craven 2002). Despite Kaokoveld being an area of high conservation priority, it is also facing desertification due to poor agricultural land management (Maggs *et al.* 1998) and this may have substantial impact on the species that are vulnerable to extinction due to their narrow distributions. This study was aimed at modelling the distributions of several endemic woody species to determine which environmental parameters influence these distributions and predict the future distributions under projected climate change scenarios.



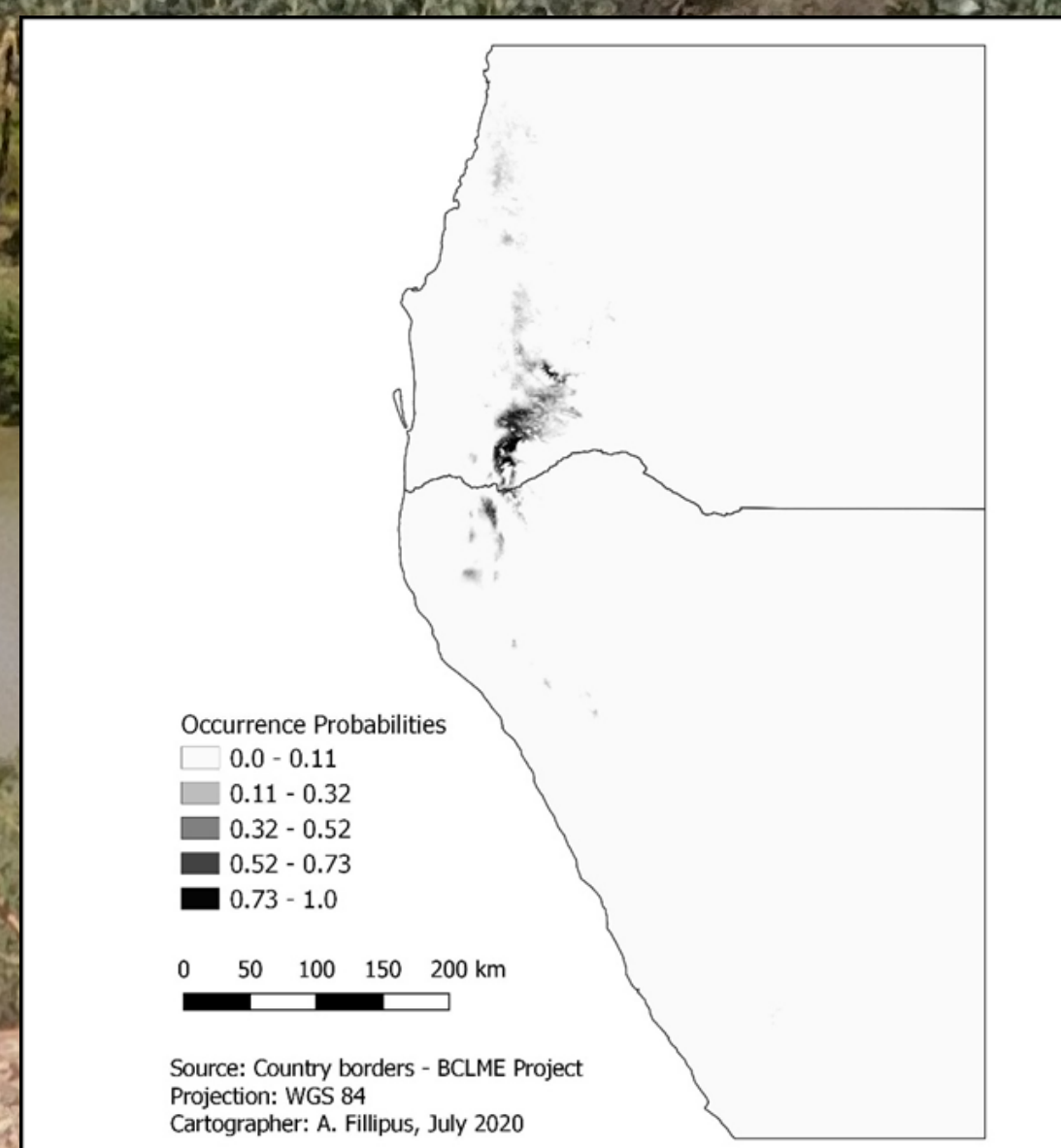
SCIONA study area

Species occurrence data were compiled from historical databases, individuals and field data collections. All environmental variables were up- or downscaled to the resolution of the WorldClim data with grid cells of 1 km x 1 km. Prior to modeling all predictor variables were tested for collinearity. The algorithm used to model species distribution was Maxent.

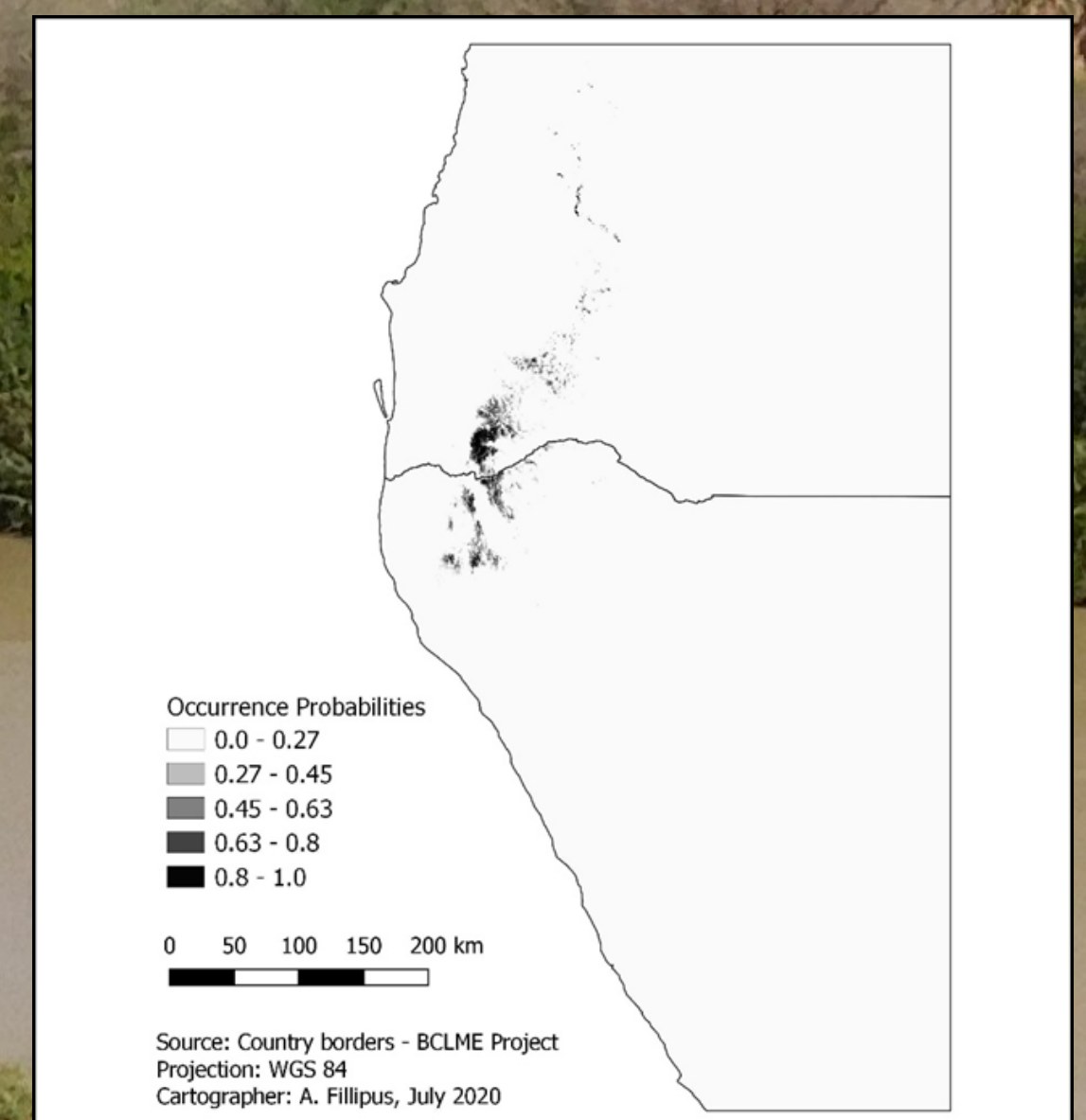
The model was validated with tenfold cross-validation and the area under the ROC curve (AUC) to measure of model fitness, as well as an independent validation with the Pearson's correlation coefficient (COR) to evaluate model accuracy. All models performed very well with AUC greater than 0.8 and COR greater than 0.5, describing realistic distribution patterns.



Species distribution of *Commiphora kuneneana* within the study area. The output is the logistic format of Maxent. Threshold applied was 10 percentile training presence, equalling 0.36.



Species distribution of *Commiphora mossamedensis* within the study area. The output is the logistic format of Maxent. Threshold applied was 10 percentile training presence, equalling 0.11.



Species distribution of *Maerua kaokoensis* within the study area. The output is the logistic format of Maxent. Threshold applied was 10 percentile training presence, equalling 0.27.

