The southernmost European conifer forests are considered vulnerable areas to climate change. Recent climatic trends towards warmer and drier conditions across the Mediterranean Basin might render some of these populations more vulnerable to drought-induced growth decline at the southernmost limit of the species distribution and in relict forests. In addition to climate drivers, the land use changes and past management drive the growth response to climate change effects. We used dendroecology to answer this question: if the south limits is a best proxy to study the drivers of climate change effects across species distribution? Our results suggest that current alterations in climate differentially affect conifers rear-edges populations, having the capacity to alter current distribution limits. Forecasting changes in the species range due to climate change should include this information to obtain more realistic predictions, particularly in Mediterranean rear-edge areas.