Universität Basel

Publication

Green alder encroachment in the European Alps: The need for analyzing the spread of a native-invasive species across spatial data

Forest regrowth is an ongoing process in the European Alps. In the Unteralptal, a valley in central Switzerland, landscape characteristics show considerable change toward the encroachment of green alder (Alnus viridis (Chaix) DC. = Alnus alnobetula (Ehrh.) K. Koch). Initially, green alder was described to grow on moist, north-facing and steep slopes of high geomorphic activity. However, the recent spreading of green alder described in several studies over the alpine arc questions the ecological habitat described in historic literature. Thus, a time series of aerial photographs and a digital elevation model (DEM) with a resolution of 2 m were used to find proxies for green alder encroachment. The cover of "new shrub areas" was analyzed based on relief parameter values and geomorphic landforms. The results show that green alder is spreading on more gentle slopes and well-drained areas, as well as on areas with lower geomorphic activity than anticipated. Thus, the habitat spectrum of green alder is much wider than assumed and encroachment has potentially greater consequences for landscape ecology than expected.