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Direction and magnitude of change in soil use for a wetland area in Chile: Puren marshes, a priority site for biodiversity conservation (stage 1).

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ABSTRACT

Land managers and policymakers need information about soil change caused by anthropogenic and non-anthropogenic factors to predict the effects of management on soil function, compare alternatives, and make decisions. This is particularly relevant in highly fragile ecosystems such as wetlands or humid systems. The wetlands require the presence of three key components: hydric soils, hydrophytic vegetation and wetland hydrology. Therefore, the presence of hydric soils in humid systems is essential for the existence of a wetland. In Chile, one of the geographic zones with the greatest diversity of humid systems is the coast of the Araucanía Region, which contains one of the largest and most threatened humid systems of the region, Puren Marshes, whose soils are only generically described as alluvial terraces and miscellaneous swamp. In this area, studies have reported a high intensity of anthropogenic activity, generating soil erosion, loss of wetland coverage and landscape alteration.
For this first stage of a main investigation about the vulnerability of hydric soils to changes in patterns of soil use, the objective was to characterize the variables of soil use in the Puren Marshes and determinate the direction and magnitude of change in soil use in the study area for the period between 1994 and 2007 (the official reports indicate that until 1994, the total area of Puren Marshes was 1147 ha). For the analyses, were used official reports of soil use, the coverages were obtained from the project map databases "Catastro y Evaluación de los Recursos Vegetacionales Nativos de Chile" 1993 and its update for La Araucanía, Regional Government of La Araucanía 2011, DMF CONAF 2010 and IGM 2007. The map information was processed in ARCGIS 9.3.1 software under UTM coordinates, datum WGS 84 and 18 South Time extended. Was developed a multitemporal analysis by construction of transition matrix and confusion matrix. The results obtained show that for the period analysed, the wetland area was reduced in a 42.4% in a rate of 3.3 ha y-1. The loss of the wetland area is due to change of land use to agricultural crops (26.2%), forest plantation (5.3%) and grassland (4.1%). With the information generated, it was possible to identify the areas of greatest pressure of soil use in the study site, allowing precise monitoring of the state of hydric soils to changes in the pattern of land use.

KEYWORDS
hydric soils, wetlands, soil use change, soil vulnerability, Puren marshes

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