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Clara Mosso
cmosso@ufl.edu

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Urban Development in Ushuaia, Patagonia Argentina: Assessing Challenges for Native Forests' Conservation and Modelling Uncertainty in Ecosystem Services Provision.

Clara Mosso^a, Mark Hostetler^b, Francisco Escobedo^c

^aSchool of Natural Resources and Environment, University of Florida, Gainesville, Florida, USA (cmosso@ufl.edu); ^bWildlife Ecology and Conservation Department, University of Florida, Gainesville, Florida, USA (hostetm@ufl.edu); ^cFacultad de Ciencias Naturales y Matemáticas, Universidad del Rosario, Bogotá, Colombia (franciscoj.escobedo@urosario.edu.co).

Abstract: Argentina's Native Forests Protection Act # 26,331 enforces the use of spatial planning as a tool to regulate native forest's land use. However, it focuses on agricultural expansion as the main cause of forest loss while excluding other drivers, like urban expansion. Consequently, there is a lack of guidelines for the spatial planning of native forests in urban and wildland-urban interface areas. In particular, the city of Ushuaia in Tierra del Fuego (Argentina) has been suffering an extraordinary population increase and the unplanned establishment of new settlements in the last decades. This occurs in a context of human and ecosystem vulnerability. As a preliminary step to the use of InVEST models for the evaluation of ecosystem services provision under diverse urban development scenarios in Ushuaia, the quality of currently available data in governmental and academic sources was assessed. Two InVEST's models were tested: carbon storage and sequestration, and water yield. Also, an online survey was designed with the aim of assessing local stakeholders' perceptions around future development scenarios. Geospatial data for Tierra del Fuego province (1:50.000) was evaluated against other georeferenced products available at regional or global scale (i.e., soil cover map and reference evapotranspiration grid), finding that there is a lack of applicable information for the use of these models at a local level. In order to improve the predictive ability of ecosystem services modelling approaches at local levels in Patagonia, it is not only necessary to generate new geospatial data but also to incorporate the socio-political framework.

Keywords: InVEST models; Land use planning; Native forests