

A Multidisciplinary Project for Sustainable Management Planning in Karst, Chiapas, Mexico

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Forest Service staff through the Office of International Programs has worked with the Reserva de la Biosfera Selva el Ocote in Chiapas, Mexico since 1993. The joint effort began to focus on the Rio la Venta canyon in 2010, a key area for conservation within the reserve. Surface water is scarce in el Ocote due to karstification, so the canyon and river provide important habitat for the riparian vegetation and many rare and endangered biota. However, karst systems are particularly vulnerable to overexploitation and pollution due to their high hydraulic conductivity and points of rapid infiltration. A multifaceted and sustainable approach for management is necessitated by the complex hydrology of karst systems and the easily impacted nature of its resources. The Forest Service Office of International Program has supported this multidisciplinary project to assess and address current and potential environmental issues for the largest sub-catchment of the Rio la Venta watershed as a foundation for creating sustainable management strategies in the canyon.

A level one assessment spatially depicted and quantified human disturbance in a GIS

based on information from a wide range of stakeholders and field surveys. The assessment also mapped areas of vulnerability to groundwater contamination. Results from the assessment show the area to be fairly pristine, with minimal environmental disturbance. The majority of the study area is classified as moderately vulnerable to groundwater contamination; however areas of high vulnerability exist. Current threats to the ecosystem stem from local practices related to residents' daily water use, agriculture, and animal husbandry. The reserve lacks the ability to enforce regulations and large areas of private land exist within the sub-catchment, so the assessment concluded that top-down management approaches are unsustainable. Drawing from the final model created by cross-referencing disturbance with vulnerability, the project created and implemented water quality monitoring and karst education projects incorporating local residents in the areas of concern. Future work includes similar assessments of other subcatchments within the larger Rio la Venta Watershed including continued dye trace studies, and development of a water budget through partnerships with local universities.

