

Payments for ecosystem services in Costa Rica

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Over 25% of Costa Rica's land area has been dedicated to Protected Areas, making it a leader in Central and South America for environmental policy; however, many of these Protected Areas have been placed in high slope areas which have a limited risk of deforestation without protection. Beyond these already protected areas, there is an assessment of priority protection zones that are to be targeted for future PES acquisitions. This heavy focus on environmental protection the objectives of this study are to: i) quantify the value of ecosystems services in the currently Protected Areas, and ii) to assess, value, and rank the ecosystem services in the priority protection zones to provide commentary on which areas should be targeted for legislative protection.

The ecosystem services assessed in this study are carbon sequestration potential, recreational/ecotourism values, level of endangered species, and risk to the ecosystem. The InVEST open source model from the Natural Capital Project at Stanford was used to evaluate the supply and value of these ecosystem services. These model values were compared against remote sensing and in-situ data for validation and tested for sensitivity. The ecosystem services values were then combined to derive the total value of each Protected Area. Subsequently, the priority protection zones were analyzed for the current supply and value of these ecosystem services. These values were combined and ranked to determine which of these zones would provide the most ecosystem services, and therefore natural capital value, if protected. This was combined with the current ranking system to determine which areas should be protected first, combining the current payment system with the potential revenue generated from unaccounted for ecosystem services.

Overall, the Protected Areas in the Puntarenas Province generated the highest recreation values, followed by those in Alajuela. The central cordilleran Protected Areas had the highest number of endemic and endangered species present. Carbon sequestration valuation was highest in the Limon and Guanacaste Provinces, with carbon sequestration values in Barra del Colorado up to 50,000,000 USD and in Santa Rosa up to 20,000,000 USD by 2069. Overall, there was only one protected area that ranked high in all categories, which was the Cordillera Volcan Central. There were also 4 Protected Areas which ranked highly in both tourism generation and species protection, Braulio Carillo, Volcan Poas, Arenal-Monteverde and Volcan Irazu. Of the 367 priority protections zones that have been identified, only 9 ranked highly in three ecosystem service supplies. The highest ranked Protected Areas were predominantly in the Cartago, Heredia, and Limon Provinces, with hotspots in both Guanacaste and Alajuela.

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