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**Land Tenure Center**

AN INSTITUTE FOR RESEARCH AND EDUCATION ON SOCIAL STRUCTURE, RURAL INSTITUTIONS, RESOURCE USE, AND DEVELOPMENT



**TENURE BRIEF**

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UNIVERSITY OF WISCONSIN — MADISON

**MONITORING AND ENFORCING  
PAYMENT FOR ECOSYSTEM SERVICES PROGRAMS**

**LESSONS LEARNED**

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Private landowners and other community members should be rewarded for protecting ecosystem services and biodiversity locally. To be sustainable, such incentive schemes must include training for community members to monitor and enforce compliance. An ongoing project in Ecuador is developing cost-effective, long-term monitoring strategies for a program aimed at protecting large and endangered animals. This brief summarizes the lessons learned.



SINCE 2006 FUNDACIÓN Cordillera Tropical (FCT) has been developing a program to protect water and wildlife in the Nudo del Azuay, southern Sangay National Park (SNP) in Ecuador. This payment for the protection of environmental services (PPES) program rewards landowners who protect tropical montane forests from the upward expansion of the agricultural frontier and páramo grasslands from increased cultivation and road building.

Like many protected areas in the tropics, the majority of SNP's ostensibly public

lands are also the property of farmers and indigenous communities with rights pre-dating the park's establishment. A successful incentive program, therefore, must include close collaboration among local property owners, regional and national actors, and continuous local engagement in all aspects of the process. Success also requires a monitoring plan that helps ensure that conservation is occurring on the private lands and protected areas involved. This brief outlines the development and implementation of a monitoring plan for the SNP PPES. The brief then provides the lessons learned during this process that have general applicable value for other incentive programs around the world.



## How do we know it works?

In 2009, FCT signed a cooperative agreement with the Ecuadorian Ministry of Environment to collaborate on the *SocioBosque* conservation incentive program. This program provides landowners with an economic incentive to protect areas of critical conservation importance for the next 20 years. FCT assists local landowners attempting to enter the program. This has included visits to homes, assistance with applications, and, most significantly, helping create a high-quality geo-referenced map of the conservation area (examples of such a property map are available upon request from FCT.) FCT expects to have enrolled 12 landowners and more than 500 hectares of land by the end of 2010.

Long-term conservation of high montane forest and *páramo* ecosystems requires rigorous monitoring to assure that endangered wildlife is protected within participating properties and that the protected private properties form critical habitat conservation areas. The Carnivore Coexistence Lab (CCL) of the Nelson Institute for Environmental Studies at the University of Wisconsin-Madison has worked with FCT in developing cost-effective, long-term monitoring strategies for large and endangered mammals, such as the Andean bear. For example, CCL students have demonstrated the efficacy of using motion-activated remote cameras to detect large-bodied vertebrates and, most recently, to identify and monitor individual Andean bears persisting on private and communal properties (see *LTC Brief 13*).

CCL joined FCT to train community parabiologists and train FCT field staff to use state-of-the-art, field-tested methods to monitor the endangered Andean bear population across 96,000 hectares of private lands. Training included formal workshops, a course that addressed human-wildlife conflicts (see *LTC Brief 7*), and a field course on how to

install and monitor infra-red activated, remote field cameras. Informal mentoring includes training in project development and management, and guidance and oversight of the development of a scientifically robust study design.

In developing and implementing the training and monitoring strategy, FCT and CCL considered the following methods integral to a successful program.

**Engage the community in monitoring.** FCT and CCL began training local community members as parabiologists, or community monitors. The target date to have them fully trained is mid-2011. At that time, the parabiologists will become park employees working as liaisons between their communities and the SNP. The parabiologists include representatives from seven mestizo and indigenous communities within or near the park. Three are bilingual Quichua-Spanish speakers. The goal is to ensure that local community members become future leaders in national park management and biodiversity monitoring.

**Engage landowners and the broader community.** We focused on better understanding landowner tolerance and perceptions to threatening wildlife, and then used these insights to guide interventions. A monetary incentive, such as that provided by *SocioBosque*, may form part of an effective strategy to protect wild lands in southern SNP. However, monetary incentives are not likely to change deeply held local perspectives about threats posed by wildlife.

Effective conservation must adequately respond to the costs (both monetary and to quality of life) suffered by landowners who face wildlife threats to domestic animals and other property. We used short courses, community meetings, workshops, and small-group meetings to share information and transfer technical skills on how to respond effectively to threatening wildlife.

**Use the right tools and disseminate results to show that the methods work.** The community parabiologists monitor biodiversity on private lands within SNP using indirect sign surveys within forest and *páramo*, and remote camera-traps located in forest. In 2010 CCL transitioned from field testing monitoring methods and identifying endangered Andean bears on private lands to a training role. Training included teaching local community parabiologists and FCT field staff site-specific



**Evidence of unique animals on private land can lead to landowners helping in efforts to protect wildlife.**

*Photo by Becky Zug.*

and field-tested methods to monitor wildlife, particularly the Andean bear. We shared knowledge and skills with a wide array of audiences: local organizations, university students, members of the local press, international donors, and the general scientific community. Most critically, the information generated has been shared with participating landowners. For example, sharing photos of wildlife on a landowner's land can create its own incentive for that landowner to conserve and protect wildlife.

## **Lessons learned**

With the 10 community monitors trained in 2009-2010, and a further 18 University de Azuay students and FCT staff trained by CCL in methods for understanding and managing human-wildlife conflicts, the work has yielded seven lessons applicable to any conservation incentive program.

**Combine external technical knowledge with local expertise at every stage.** Just as outside experts rarely understand the local context and the feasibility of different methods for field monitoring, local experts require technical input from an outside perspective. This synergy should exist not only at the training and design phases of a project but throughout to assure the high quality of monitoring data, continued sociopolitical acceptance and feasibility of the field activities, and effective dissemination of methods and results locally, regionally, nationally, and internationally.

CCL and FCT achieved this continuous complementary mix of expertise as follows. CCL brought lessons, methods, equipment, and funding from several disciplines and countries via quarterly, intensive training and planning visits. FCT supported a pair of trained biologists to transfer knowledge to community monitors, contributed funding from several international and national sources, and provided weekly administrative, financial, and personnel oversight. Local community monitors (parabiologists) contributed their knowledge of the people, wildlife, and landscape in continuous surveillance and bimonthly, systematic surveys of their predetermined patrol routes.

**Build teamwork among community monitors.** The nature of the patrol work in remote areas with little interaction among team members necessitates focused team building. Community monitors patrol in teams of two, covering more than 70,000 hectares. Community monitors use field notebooks and GPS units to maintain high-quality records of



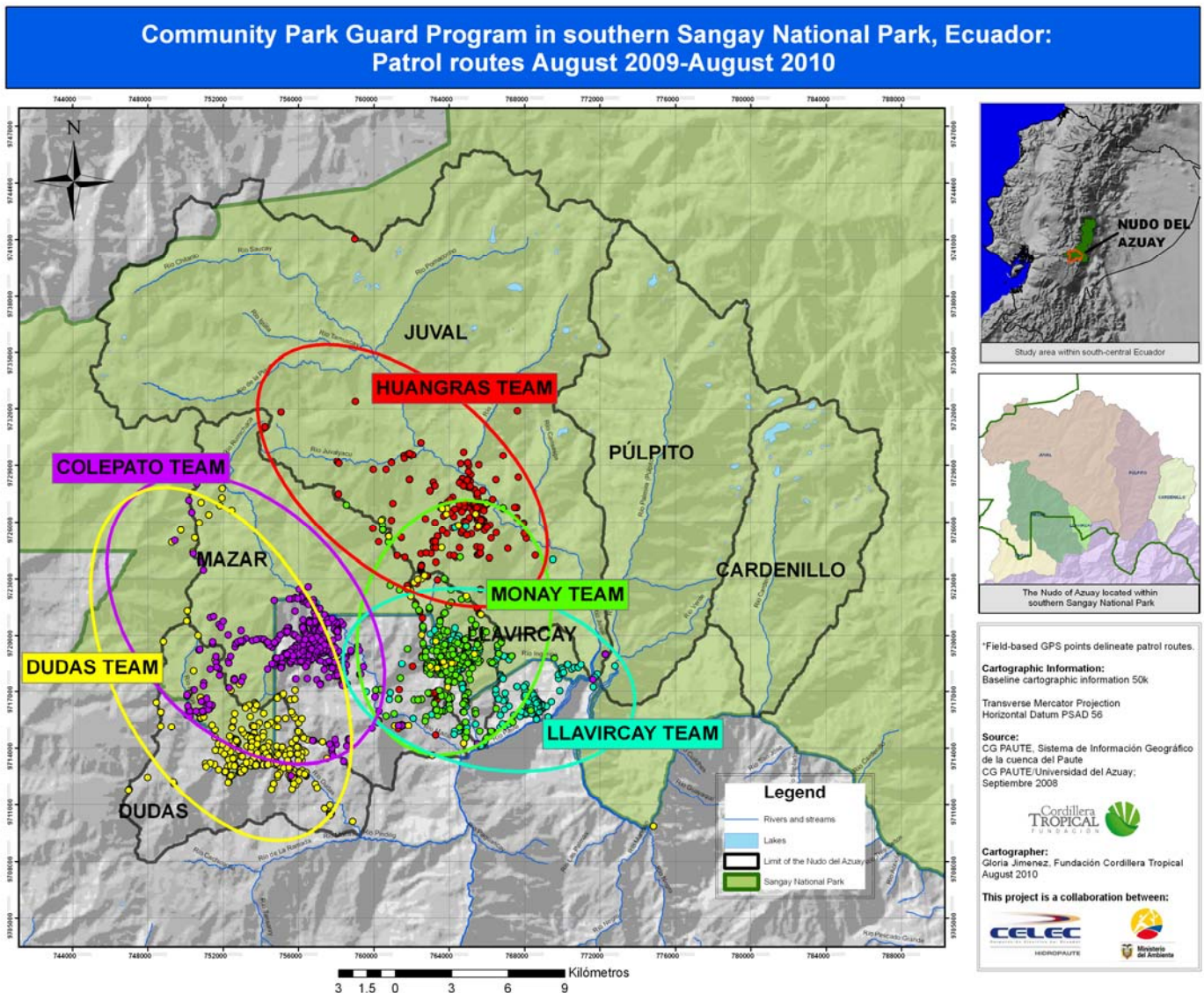
wildlife signs (see Figure 1). Each community monitor pair works in a unique and remote field location with little interaction among the different crews. As such, weekly meetings between park guards and FCT staff facilitate communication, rapid response to equipment problems, and collaborative problem-solving.

**Train community monitors in skills they may need in the field and the office.** Ideally community monitors will go on to careers in monitoring PES programs and possibly train or supervise others performing such tasks. Therefore community monitors must be seen

as the long-term capacity of the community to perpetuate monitoring. FCT training of the community monitors has included:

- 13,520 hours of patrol in four sub-watersheds (see Figure 1)
- 3,520 hours of training and capacity building via formal workshops on hydrological monitoring, herpetofauna and large mammal identification, and skill-based training on the use of scientific equipment, professional skills, and management of a microenterprise.

**Figure 1. Eleven months of patrolling shown by GPS locations taken by ten community park guards within Sangay National Park, Ecuador.**



- 80 hours of environmental education in local schools
- 64 hours of patrol for illegal fishing in the Dudas sub-watershed
- weekly meetings to provide ongoing training in field-based biology and monitoring skills, including the use of Global Positioning Systems (GPS), photography using point-and-shoot digital cameras, computing skills including data and photo download, word-processing, leadership, and environmental education.

**Maintain the links between community monitors and their home communities, especially participating landowners.** The community monitors serve continuously as ambassadors for the project, the PPES program, and the communities they represent. Although FCT/CCL-trained community monitors have little formal education (most have completed school through 6<sup>th</sup> grade), they have far exceeded expectations by serving as liaisons between the park and communities, providing on-site education about the park to residents, school children, and visitors, and demonstrating keen interest in research and monitoring projects.

In May 2010, CCL and FCT designed and led a two-week short course entitled “Balancing human needs and carnivore conservation” for 15 undergraduates from the University of Azuay in Cuenca, Ecuador (co-financed by the Fulbright Senior Specialist Program). An overnight field excursion allowed participants to learn camera-trapping techniques *in situ* and enhance their understanding of bear attacks on livestock via interviews with local landowners. In August 2010, FCT began training landowners and their families how to design, install, and maintain deterrents and preventive measures against bear attacks on dairy cattle.

**Reach beyond the project area to learn continuously and share lessons widely.** A project team must learn to make mid-course corrections, add new insights to improve

efficiency and solutions, and anticipate problems. In our project, FCT provides guidance and training to colleagues at nearby Cajas National Park in the Azuay Province, renowned bear expert Armando Castellaños at Fundación Espiritu del Bosque in Ecuador, and the Ecuadorian Ministry of Environment. The work is further disseminated to the regional water fund, FONAPA, which is developing a watershed-level biodiversity and hydrological monitoring plan. CCL has reported on project goals and methods to colleagues in Ecuador and beyond with dozens of public talks and publications (for examples, see <http://www.nelson.wisc.edu/people/treves/Publications.html>). This outreach has included the Wildlife Conservation Society-Ecuador, Conservation International-Ecuador, and the Ecuadorian Ministry of the Environment.

**Combine social scientific monitoring with biodiversity monitoring to ensure on-the-ground conservation results.** CCL is supporting FCT in social scientific research on landowners’ changing attitudes to biodiversity, management interventions, incentive schemes, and reprisals against wildlife. The surveys are intended to provide a baseline by which to measure changes in perception and attitude over the life of the project. CCL also is testing new methods for non-invasive monitoring of endangered vertebrates. Our partnership creates an exceptional opportunity to train community monitors to understand and deploy advanced monitoring equipment, such as remotely triggered camera traps, and field devices for the passive collection of hair for DNA.

**PES schemes must reliably deliver economic incentives to private landowners.**

When *SocioBosque* approached FCT with a proposal to work together, this helped create long-term stability with the promise that the Ministry of Environment will provide funding for the duration of 20-year conservation contracts. However, there have been problems delivering incentives.

FCT pre-enrolled 3000 hectares owned by 140 beneficiaries on 39 parcels to participate in the *SocioBosque* program. As of May 2010 (the end of the most recent enrollment period), *SocioBosque* accepted just two area landowners to participate in the program. Large-scale participation in the *SocioBosque* program has been inhibited by a myriad of issues. For example, initially *SocioBosque* focused solely on forest conservation, excluding other ecosystems. However, in June 2009, the Ministry of Environment expanded the program first to include *páramos* and then, in March 2010, landowners within protected areas. Nevertheless, program designers have yet to accept the majority of landowners in the SNP region because they lack a geo-referenced map of the property and reference to the total titled area (in hectares).

Furthermore, *SocioBosque* must resolve the incompatibility between regional and national land titling agencies. A poorly organized decentralization of land titling to provincial leaders led each of the 24 provinces to title land in a distinct manner. Ultimately, some provinces' land titles remain unrecognized by the regional capital.

The short-term result is that the *SocioBosque* program continues to value overall number of

hectares enrolled without necessarily creating contiguous conservation blocks linking national parks with their buffer zones or important habitat for wide-ranging wildlife.

Similarly, a lack of direct benefits has slowed the acceptance of a private, eco-label scheme, Wildlife Friendly Certified. To date, only All Things Alpaca has been certified in the project area. No other property owners have developed value-added local products that could potentially apply for Wildlife Friendly certification.

The critical lesson is that when PES funds don't flow, other incentives must be provided in the interim. While FCT itself cannot pay pre-enrolled landowners, it is able to help landowners mitigate the costs of living alongside damaging wildlife. FCT and CCL sponsored a workshop that brought together 52 private landowners to discuss property damage by wildlife and non-lethal interventions to mitigate those losses. Five of those landowners are working with FCT to plan and implement non-lethal deterrents, which will prevent the endangered Andean bear from attacking dairy cattle on remote pastures. While PES funds are slow in flowing to participating landowners, this local collaboration promises to offset costs of conservation for environmentally-concerned landowners.



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